



# **Conseil d'administration et innovation: théorisation et expérimentation dans les petites et moyennes entreprises**

**Thèse**

**Ramzi Belkacemi**

**Doctorat en sciences de l'administration**  
Philosophiæ doctor (Ph. D.)

Québec, Canada

© Ramzi Belkacemi, 2023

**Conseil d'administration et innovation :  
théorisation et expérimentation dans les petites et  
moyennes entreprises**

**Thèse**

**Ramzi Belkacemi**

Sous la direction de :

Sophie Veilleux, directrice de recherche  
Marie-Josée Roy, codirectrice de recherche

## Résumé

L'importance du lien entre le conseil d'administration (CA) et l'innovation fait consensus tant au sein de la communauté scientifique que dans le monde des affaires. Néanmoins, à ce jour, il est encore difficile d'assimiler les mécanismes sous-jacents à l'association de ces deux notions centrales pour toute organisation contemporaine. Cette thèse doctorale vise donc à tendre vers une compréhension substantielle de la manière dont cet organe de gouvernance particulier peut influencer cette retombée organisationnelle spécifique, particulièrement dans le contexte des petites et moyennes entreprises (PME). Celle-ci est composée de trois articles scientifiques et s'inscrit dans le domaine de la stratégie, plus précisément en se concentrant sur le groupe décisionnel qui représente le plus haut échelon stratégique (c.-à-d. le CA) et une retombée organisationnelle qui est de nature stratégique (c.-à-d. l'innovation) dans un contexte où la portée stratégique de chacun de ces deux éléments a fait ses preuves (c.-à-d. celui des PME).

Le premier article, qui en est un conceptuel, consiste en un examen exhaustif des études portant sur le lien entre le CA et l'innovation. Celui-ci prend la forme d'une revue systématique de la littérature sous une perspective de contingence. Le cadre conceptuel intégrateur et la cartographie détaillée qui y figurent mettent en relief de multiples antécédents de l'innovation avec une focalisation sur le CA, tout en accordant une grande importance aux facteurs environnementaux internes et externes. Ultimement, cette étude théorise un processus général permettant de mieux appréhender l'impact de diverses dimensions du CA sur tant les intrants que les extrants d'innovation et propose un agenda de recherche. Ce volet conceptuel de la thèse doctorale a façonné les deux segments du volet empirique.

Le second article, qui en est un empirique, théorise et expérimente un processus multiphasique et séquentiel, qui régit l'impact des effets d'interactions entre diverses facettes du CA (c.-à-d. composition, rôles et efficacité) sur l'innovation dans le contexte des PME, tout en considérant l'influence potentielle de diverses caractéristiques organisationnelles (c.-à-d. taille, âge, secteur, performance financière et internationalisation des PME). Les résultats produits sur la base d'une modélisation par équations structurelles révèlent, entre autres, que le lien entre le CA et l'innovation implique des interactions, et plus précisément des effets de

médiation, entre différentes composantes du CA. Concrètement, il en ressort que ce lien se matérialise principalement en trois temps : (1) présence d'un haut degré de capital humain au sein du CA, (2) niveau d'engagement élevé du CA dans son rôle stratégique et (3) grande efficacité du CA dans l'accomplissement de ses tâches. Ainsi, cette étude couvre la littérature actuelle, qui se concentre principalement sur les caractéristiques structurelles (p. ex. taille et indépendance du CA), privilégie l'hypothèse de liens directs (c.-à-d. omission des effets d'interaction) et analyse généralement de manière individuelle les trois grandes dimensions du CA considérées simultanément (c.-à-d. composition, rôles et efficacité).

Le troisième article, qui en est un empirique, théorise et expérimente une logique de continuum et une approche configurationnelle, qui régissent l'impact des effets combinés de certains processus liés au CA (c.-à-d. établissement, intégration, centralisation et bureaucratie), toujours par rapport à l'innovation et dans le contexte des PME, tout en considérant l'influence potentielle du niveau de croissance bidimensionnelle des PME (c.-à-d. taille et âge). Les résultats produits sur la base d'une analyse par logique floue démontrent que l'innovation dans les PME peut émaner de 10 combinaisons incluant divers processus liés au CA; lesquels peuvent être adaptées selon la taille et/ou l'âge des PME. Ainsi, cette étude va au-delà de la vision limitée qui prévaut actuellement dans la littérature quant à l'hypothèse de liens linéaires entre le CA et l'innovation et s'émancipe de la tendance consistant à établir des hiérarchies qui sous-entendent que certains éléments isolés seraient forcément prééminents par rapport à d'autres à des fins d'innovation

En somme, cette thèse doctorale permet de repenser et de redécouvrir le lien entre le CA et l'innovation, particulièrement dans le contexte PME, en procurant une compréhension singulière, inclusive et approfondie de cette thématique. En ce sens, parallèlement à ses multiples contributions scientifiques, ce travail de recherche renferme également plusieurs recommandations d'actions concrètes tant pour les dirigeants que les décideurs politiques, qui témoignent de sa portée plus pratique.

## **Abstract**

There is consensus both within the scientific community and in the business world on the importance of the link between the board of directors (BoD) and innovation. Nevertheless, to date, it is still difficult to assimilate the mechanisms underlying the association between these two central notions for any contemporary organization. Therefore, this doctoral thesis aims to attain a substantial understanding of how this particular governance body can influence this specific organizational outcome, particularly in the context of small and medium-sized enterprises (SMEs). This is composed of three scientific articles and falls within the field of strategy by focusing on the decision-making group that represents the highest strategic level (i.e., the BoD) and an organizational outcome of a strategic nature (i.e., innovation) in a context where the strategic scope of each of these two concepts has been supported (i.e., that of SMEs).

The first article, which is conceptual, consists of an exhaustive examination of studies on the link between BoD and innovation. This takes the form of a systematic review of the literature from a contingency perspective. The integrative conceptual framework and detailed mapping it contains highlight multiple antecedents of innovation with a focus on the BoD, while attaching great importance to internal and external environmental factors. Ultimately, this study theorizes about a general process that helps to better understand the impact of different dimensions of the BoD on both innovation inputs and outputs and proposes a promising research agenda. This conceptual part of the doctoral thesis shaped the two segments of the empirical section.

The second article, which is empirical, theorizes about and experiments with a multiphasic and sequential process, the impact of interaction effects between various facets of the BoD (i.e., composition, roles, and effectiveness) on innovation in the context of SMEs, while considering the potential influence of various organizational characteristics (i.e., the size, age, sector, financial performance, and internationalization of SMEs). The results produced based on structural equation modeling reveal, among other things, that the link between the BoD and innovation involves complex interactions and, more specifically, mediation effects between various components of the BoD. Concretely, it highlights that this link materializes mainly through three stages: (1) the presence of a high degree of human capital within the

BoD, (2) a high level of commitment of the BoD to its strategic role, and (3) BoD's great effectiveness in accomplishing its tasks attested by its historical contributions. Thus, this study transcends the current literature, which mostly focuses on structural variables (e.g., size and independence), favors the hypothesis of direct links (i.e., the omission of interaction effects), and generally analyzes individually the three main dimensions of the BoD that have been considered simultaneously (i.e., composition, roles, and effectiveness).

The third article, which is empirical, theorizes about and experiments with a continuum logic and a configurational approach, the impact of the combined effects of certain original board-related processes (i.e., establishment, integration, centralization, and bureaucracy), always regarding innovation and in the context of SMEs, while considering the potential influence of SMEs' bi-dimensional level of growth (i.e., size and age). The results produced based on Fuzzy-set Qualitative Comparative Analysis (FsQCA) demonstrate that innovation in SMEs can emanate from 10 complex configurations, including various board-related processes, which can be adapted according to the size and/or age of SMEs. Thus, this study goes beyond the narrow view that currently prevails in the literature regarding the hypothesis of linear links between the BoD and innovation and emancipates itself from the tendency to establish hierarchies implying that certain isolated elements would necessarily be pre-eminent regarding innovation.

In short, this doctoral thesis makes it possible to rethink and rediscover the link between BoD and innovation, particularly in the context of SMEs, by providing a singular, inclusive, and in-depth understanding of this theme. In this sense, along with its multiple scientific contributions, this research also contains several recommendations for concrete actions for both executives and policy makers that testify to its more practical scope.

# Table des matières

Résumé .....	ii
Abstract.....	iv
Liste des tableaux .....	x
Liste des figures.....	xi
Liste des abréviations et des sigles.....	xii
Remerciements .....	xv
Avant-propos .....	xviii
Introduction générale.....	1
CA et innovation : émergence, évolution et contextualisation .....	1
Définition et portée de l'innovation.....	3
Socle commun des antécédents de l'innovation .....	6
CA et innovation : genèse et problème de recherche.....	11
CA et innovation : objectifs, questions et articulations .....	17
Bibliographie (introduction générale).....	23
Chapitre 1 : Article 1 - Board of directors and innovation: A systematic literature review from a contingency perspective.....	34
1.1. Résumé.....	34
1.2. Abstract.....	35
1.3. Introduction.....	36
1.4. Methodology .....	40
1.4.1. Systematic approach.....	40
1.4.2. Formulating one or more research questions .....	40
1.4.3. Identifying and locating relevant studies .....	41
1.4.4. Applying the inclusion and exclusion criteria.....	41
1.5. Results.....	44
1.5.1. Descriptive component.....	44
1.5.1.1. Temporal trends.....	45
1.5.1.2. Empirical trends.....	46
1.5.1.3. Sectoral trends .....	46
1.5.1.4. Geographic trends.....	46
1.5.1.5. Dimensional trends.....	46
1.5.1.6. Editorial trends .....	47
1.5.1.7. Theoretical trends.....	47
1.5.1.8. Semantic trends .....	47
1.5.2. Analytical component .....	48
1.5.2.1. Internal environment and innovation.....	51
1.5.2.1.1. BoD and innovation.....	51
1.5.2.1.1.1. BoD composition and innovation .....	51
1.5.2.1.1.2. BoD roles and innovation .....	58
1.5.2.1.1.3. BoD processes and innovation.....	59
1.5.2.1.1.4. Other aspects related to BoD composition.....	60
1.5.2.1.1.5. Inverted causal relations (Innovation-BoD).....	61
1.5.2.1.2. Shareholders and innovation.....	61
1.5.2.1.3. Top management teams and innovation .....	62

1.5.2.1.4. Chief executive officer and innovation.....	63
1.5.2.1.5. Firm size and innovation.....	64
1.5.2.1.6. Firm age and innovation .....	65
1.5.2.1.7. Firm financial health and innovation.....	65
1.5.2.1.8. Other relevant internal environment elements and innovation .....	66
1.5.2.2. External environment and innovation .....	67
1.5.2.2.1. Firm industry and innovation.....	67
1.5.2.2.2. Firm network and innovation.....	67
1.5.2.2.3. Firm region and innovation.....	68
1.5.2.2.4. Other relevant external environment elements and innovation .....	68
1.5.2.3. Organizational outcomes and innovation .....	68
1.5.2.3.1. Innovation inputs and outputs.....	69
1.5.2.3.2. Innovation and financial performance .....	69
1.5.2.3.3. Financial performance and innovation .....	69
1.5.2.3.4. Internationalization, innovation, and financial performance .....	70
1.6. Research agenda and recommendations .....	71
1.6.1. Analytical frameworks.....	71
1.6.1.1. Board composition beyond traditional measures .....	71
1.6.1.2. Underrepresented board concepts.....	72
1.6.1.3. Conceptualization of innovation.....	72
1.6.1.4. Contingency approach.....	72
1.6.2. Theoretical constructs .....	73
1.6.2.1. Agency theory .....	73
1.6.2.2. Stewardship theory .....	73
1.6.2.3. Resource-based theory.....	74
1.6.2.4. Resource dependence theory .....	74
1.6.2.5. Stakeholder theory.....	75
1.6.2.6. Contingency theory .....	75
1.6.3. Methodological designs .....	76
1.6.3.1. Primary data.....	76
1.6.3.2. Statistical shortcuts.....	76
1.6.3.3. Qualitative approach.....	77
1.6.3.4. Geographical context.....	77
1.6.3.5. SMEs .....	77
1.6.3.6. Financial sector.....	78
1.7. Conclusion .....	78
1.7.1. Theoretical and empirical contributions.....	78
1.7.2. Empirical and policy contributions .....	79
1.7.3. Limitations and concluding remarks .....	80
1.8. References.....	81
Chapitre 2 : Article 2 – The impact of board of directors’ composition, roles, and effectiveness on innovation in small and medium-sized enterprises: A multistage theorization and experimentation .....	93
2.1. Résumé.....	93
2.2. Abstract.....	94
2.3. Introduction.....	95
2.4. Theoretical background and hypotheses development .....	99



2.4.1. Board composition and innovation .....	100
2.4.1.1. Size and innovation .....	100
2.4.2.2. Independence and innovation .....	101
2.4.2.3. Human capital and innovation .....	102
2.4.2. Board roles and innovation .....	104
2.4.2.1. Control and innovation .....	104
2.4.2.2. Strategy and innovation .....	106
2.4.3. Board effectiveness and innovation .....	109
2.5. Methodology .....	111
2.5.1. Sampling .....	111
2.5.2. Variables .....	112
2.5.2.1. Independent/mediating variables for board composition .....	112
2.5.2.2. Independent/mediating variables for board roles .....	112
2.5.2.3. Independent/mediating variable for board effectiveness .....	113
2.5.2.4. Control variables .....	114
2.5.2.5. Dependent variable .....	115
2.5.3. Data and factorial model validation .....	116
2.6. Results .....	119
2.6.1. Descriptive statistics .....	119
2.6.2. Hypothesis testing .....	121
2.7. Discussion and conclusion .....	122
2.7.1. Multistage theorization of the board's impact on innovation .....	122
2.7.2. Theoretical/conceptual implications .....	125
2.7.3. Practical/political implications .....	126
2.7.4. Limitations and avenues for future research .....	127
2.8. References .....	128
Chapitre 3 : Article 3 – Board-related processes and innovation in small and medium-sized enterprises: A continuum logic and configurational approach .....	141
3.1. Résumé .....	141
3.2. Abstract .....	142
3.3. Introduction .....	143
3.4. Conceptualization, Theorization, and Propositions .....	145
3.4.1. Board-related processes and innovation .....	145
3.4.1.1. Board-related establishment process and innovation .....	147
3.4.1.2. Board-related integration process and innovation .....	151
3.4.1.3. Board-related centralization process and innovation .....	153
3.4.1.4. Board-related bureaucratic process and innovation .....	154
3.4.2. Contingency factors and innovation .....	155
3.4.2.1. Firm size .....	156
3.4.2.2. Firm age .....	156
3.5. Methodology .....	157
3.5.1. Sample and data .....	157
3.5.2. Conditions at the board level .....	158
3.5.3. Conditions at the organizational level .....	158
3.5.4. Outcome .....	158
3.5.5. FsQCA method .....	158
3.6. Analysis and Results .....	161

3.6.1. Analysis of necessary conditions .....	161
3.6.2. Analysis of overall solution .....	162
3.6.3. Horizontal analysis of sufficient conditions.....	163
3.6.4. Vertical analysis of sufficient conditions.....	164
3.7. Discussion and conclusion.....	166
3.7.1. Implications for research.....	166
3.7.2. Implications for practitioners.....	168
3.7.3. Limitations and avenues for future research .....	169
3.8. References.....	170
Conclusion générale .....	183
Rappel de l'objectif général et des trois objectifs spécifiques.....	183
Principales contributions scientifiques .....	187
Triple théorisation originale du lien entre le CA et l'innovation.....	187
Ancrage théorique multidimensionnel du lien entre le CA et l'innovation .....	189
Conceptualisation novatrice du lien entre le CA et l'innovation .....	191
Vision inclusive du lien entre le CA et l'innovation.....	192
Principales contributions pratiques.....	193
Portée stratégique du CA .....	193
Axes d'intervention prioritaires pour optimiser les apports du CA en matière d'innovation .....	194
Axes d'intervention prioritaires pour créer un environnement propice à l'innovation .....	195
Principales limites et pistes de recherche.....	196
Limites et pistes de recherche liées à la triple théorisation originale.....	196
Limites et pistes de recherche liées à l'ancrage théorique multidimensionnel .....	197
Limites et pistes de recherche liées à la conceptualisation novatrice .....	198
Limites et pistes de recherche en lien avec la vision inclusive .....	199
Brefs mots de conclusion d'ordre général .....	199
Bibliographie (conclusion générale).....	201
Bibliographie générale.....	205
Section « introduction générale » .....	205
Section « chapitre/article 1 ».....	215
Section « chapitre/article 2 ».....	226
Section « chapitre/article 3 ».....	239
Section « conclusion générale ».....	251

## Liste des tableaux

<b>Tableau 1.</b> Piliers, constats et conséquences formant la genèse de cette thèse doctorale ...	12
<b>Tableau 2.</b> Objectif et sous-objectifs spécifiques de recherche de l'article 1.....	18
<b>Tableau 3.</b> Principales recommandations issues de l'article 1 .....	18
<b>Tableau 4.</b> Objectif et sous-objectifs de recherche de l'article 2.....	19
<b>Tableau 5.</b> Traitement des recommandations issues de l'article 1 dans l'article 2 .....	20
<b>Tableau 6.</b> Objectif et sous-objectifs de recherche de l'article 3.....	21
<b>Tableau 7.</b> Traitement des recommandations issues de l'article 1 dans l'article 3 .....	22
<b>Tableau 8.</b> Summary of the inclusion/exclusion criteria .....	42
<b>Tableau 9.</b> Summary of the major trends .....	45
<b>Tableau 10.</b> Fit of the factorial models.....	117
<b>Tableau 11.</b> Variable descriptions, confirmatory factor analysis, and measurement validity .....	118
<b>Tableau 12.</b> Descriptive statistics (continuous variables) .....	119
<b>Tableau 13.</b> Descriptive statistics (nominal variables).....	120
<b>Tableau 14.</b> Correlation matrix (Spearman).....	120
<b>Tableau 15.</b> Constructs' items, loadings, validity, and reliability .....	160
<b>Tableau 16.</b> Fit of the factorial model .....	160
<b>Tableau 17.</b> Descriptive statistics and calibration.....	160
<b>Tableau 18.</b> Correlation matrix (Pearson) .....	161
<b>Tableau 19.</b> Necessary conditions analysis for the presence of innovation .....	162
<b>Tableau 20.</b> Sufficient configurations leading to high levels of innovation in SMEs.....	162
<b>Tableau 21.</b> Propositions (theorization) and findings (validation).....	162
<b>Tableau 22.</b> Assumptions (theorization) and findings (validation).....	162
<b>Tableau 23.</b> Rappel et atteinte des principaux objectifs de cette thèse doctorale.....	162
<b>Tableau 24.</b> Rappel et atteinte des sous-objectifs spécifiques de recherche de l'article 1 .....	162
<b>Tableau 25.</b> Rappel et atteinte des sous-objectifs spécifiques de recherche de l'article 2 .....	162
<b>Tableau 26.</b> Rappel et atteinte des sous-objectifs spécifiques de recherche de l'article 3 .....	162

## Liste des figures

<b>Figure 1.</b> Structure de la thèse doctorale .....	23
<b>Figure 2.</b> Summary of the systematic review protocol .....	43
<b>Figure 3.</b> Publication trends (1988–2021) .....	44
<b>Figure 4.</b> Integrative conceptual framework of the link between the BoD and innovation .....	50
<b>Figure 5.</b> The multistage and sequential conceptual framework linking BoD composition, roles, and effectiveness to innovation.....	99
<b>Figure 6.</b> The multistage and sequential conceptual framework linking BoD composition, roles, and effectiveness to innovation including the results of the structural equation models .....	121
<b>Figure 7.</b> Conceptual framework of board-related processes following a continuum logic through a configurational approach and from a contingency perspective .....	147
<b>Figure 8.</b> Rappel de la structure et boucle finale de la thèse doctorale.....	200

## Liste des abréviations et des sigles

BoD : *Board of Directors*

CA : Conseil d'Administration

CEO : *Chief Executive Officer*

FsQCA : *Fuzzy-set Qualitative Comparative Analysis*

OCDE : Organisation de Coopération et de Développement Économiques

OECD : *Organisation for Economic Co-operation and Development*

PDG : Présidents-Directeurs Généraux

PME : Petites et Moyennes Entreprises

R-D : Recherche et Développement

R&D : *Research and Development*

SMEs : *Small and Medium-sized Enterprises*

TMT : *Top Management Teams*

*Je dédie cette thèse au socle de ma vie : ma famille.*

*« J'ai fait un peu de bien, c'est mon meilleur ouvrage. »*

*Voltaire*

## Remerciements

Une thèse doctorale est un projet de grande envergure, qu'il serait réducteur de cantonner à son caractère individuel. De ses racines à sa cime, celle-ci est en fait l'aboutissement d'un effort collectif. Je tiens donc tout naturellement à témoigner ma reconnaissance aux personnes et aux organismes qui, de manière directe ou indirecte, ont contribué à sa concrétisation.

Je me dois de réserver mes premiers remerciements à ma famille, sur qui j'ai toujours pu compter, dans l'accalmie comme dans la tempête. Cher père, sache qu'il n'a pas été nécessaire de chercher bien loin pour trouver « mon héros ». Tu es un homme de principe, d'action et au cœur pur; bref un homme remarquable et un exemple sur tous les plans. Si je deviens ne serait-ce que le quart de l'homme que tu es, je serai déjà un grand homme. Chère mère, sache que je te serai éternellement reconnaissant pour les valeurs que tu m'as inculquées et pour ton appui inconditionnel. Tu es une référence de rigueur, d'honnêteté et de classe; bref une femme d'exception et une référence à tous les niveaux. Si ma future femme n'a ne serait-ce que le quart de tes qualités, je serai un homme comblé. Vos sacrifices ne sont pas passés inaperçus et la volonté d'en être digne est souvent ce qui m'a permis de transcender les obstacles. Si certes jamais aucun geste ni aucune parole ne pourra être à la hauteur de votre dévouement, j'espère que l'accomplissement que représente cette thèse doctorale vous donnera le sentiment du devoir accompli et que vos efforts n'auront pas été vains. À mes quatre grands frères qui me sont si chers – comme j'aime à le dire – soyez assurés que nous resterons à jamais « cinq frères soudés comme les cinq doigts d'une main ». Vous avez de tout temps été de véritables piliers dans ma vie. Sans vous, tout aurait été beaucoup plus difficile et insipide. La fierté et l'amour que je lis dans vos yeux m'ont toujours servi de carburant dans tout ce que j'ai entrepris et ce cheminement doctoral n'y fait pas exception. Merci également à mes amis, qui représentent si bien le dicton stipulant que les amis sont la famille que l'on choisit.

Il est également important pour moi d'exprimer ma profonde gratitude envers mes codirectrices de recherche : les professeures Sophie Veilleux et Marie-Josée Roy. Mesdames, vous avez été d'un apport considérable, non seulement dans la production de cette thèse doctorale, mais aussi plus largement pour mon développement en tant qu'aspirant professeur-



chercheur. Il n'y a pas eu une seule rencontre de laquelle je suis ressorti sans apprendre une nouvelle chose ou sans que ma motivation ne soit stimulée. Vous avez toujours su trouver les mots justes, non seulement pour que j'avance, mais aussi et surtout pour que je progresse. En ce sens, votre importance dans mon parcours dépasse les frontières académiques et il est impossible de résumer en quelques lignes tout ce que vous m'avez apporté. Bref, sachez que j'ai pleinement conscience de la chance que j'ai eue de pouvoir côtoyer des personnes si compétentes et pourtant si humaines dans leur approche. J'espère que ces modestes mots reflètent la sincérité de la gratitude dont je suis empreint à votre égard et que cette collaboration n'est que la première d'une longue liste.

Je tiens également à adresser de chaleureux remerciements aux membres de mon jury de thèse. Là encore, je me considère comme un privilégié, car que j'ai pu compter sur un jury de prestige. Les professeurs Nabil Amara et Jean Bédard sont des sommités dans leurs domaines respectifs, mais j'ai aussi pu apprécier leurs qualités humaines. Messieurs, je n'ai notamment pas été indifférent au fait que vous m'avez ouvert les portes de votre chaire et de votre groupe de recherche respectifs, ce qui en dit long sur votre altruisme. Je me dois ici d'adresser des remerciements particuliers au professeur Amara, dont la combinaison de qualités techniques et humaines force le respect et l'admiration. Vous avez été pour moi une source d'inspiration inépuisable et nos nombreux échanges ont toujours été aussi instructifs qu'agréables. Au-delà de leur pertinence d'un point de vue purement académique, les informations et les conseils que vous avez bien voulu me partager ont souvent pris la forme de véritables leçons de vie; soyez-en sincèrement remerciés.

Je voudrais aussi témoigner ma reconnaissance à la professeure Maripier Tremblay. Dans un premier temps, pour ses précieuses suggestions et commentaires, qui ont apporté un regard fort pertinent dont la facture finale de ce travail a grandement bénéficié. Puis, de nous avoir intégrés, mes directrices de recherche et moi-même, dans ce projet passionnant portant sur la gouvernance des PME québécoises, qui cadrerait si bien avec les objectifs de ma thèse doctorale. Par la même occasion, je remercie l'évaluatrice externe, la professeure Josée St-Pierre, de m'avoir fait l'honneur d'accepter de consacrer du temps à l'évaluation de cet ouvrage scientifique. C'est pour moi une fierté de vous avoir sur mon jury de thèse, non seulement du fait de votre expertise, mais aussi compte tenu de votre contribution

significative au rayonnement de la recherche francophone dans le monde; pour laquelle j'ai un profond respect.

J'ai également une pensée pour cet enseignant du secondaire, qui m'a affirmé avec conviction que je n'intégrerai jamais une université parce que j'étais trop impliqué dans des activités sportives et que je ne me trouvais pas dans une configuration optimale pour aspirer à poursuivre des études supérieures. Il serait étonné de savoir que je suis non seulement passé par tous les cycles universitaires possibles, mais qu'aujourd'hui j'ai l'immense plaisir d'y enseigner. Il ne s'agit ici pas d'une revanche; sans rancune. À travers ce fait, mon souhait est plutôt d'adresser un message à tous ceux qui me feront l'honneur de consulter cette thèse doctorale et en particulier aux jeunes issus des quartiers de ma ville (Montréal) considérés comme « difficiles » (notamment Ahuntsic-Cartierville et Montréal-Nord), dans lesquels j'ai grandi et peu importe ce que l'on en dise tant appris : ne laissez en aucune circonstance une personne, un environnement ou un événement déterminer votre trajectoire à votre place. Et si quelqu'un s'y aventure, qu'un contexte semble sans issue ou encore qu'une situation bouleverse le cours des choses, ne sombrez pas dans le fatalisme, assurez-vous plutôt de puiser en eux la force et la détermination pour mener à terme vos objectifs, pour déjouer les pronostics parfois défavorables et surtout pour inspirer les générations futures.

Finalement, merci à l'ensemble des organismes qui m'ont fait l'honneur de me compter parmi les récipiendaires de leurs bourses ou subventions de recherche. Il m'est important de tous les citer, car ils ont grandement contribué à me procurer des conditions optimales pour compléter mon cheminement doctoral :

- Le Bureau des bourses et d'aide financière – Université Laval
- Le Centre d'Expertise en Gouvernance des Sociétés – Université Laval
- Le Centre interuniversitaire de recherche sur la science et technologie
- Le Collège des Administrateurs de Sociétés
- Le Département de management – Université Laval
- La Faculté des Études Supérieures et Postdoctorales – Université Laval
- La Faculté des Sciences de l'Administration – Université Laval
- Le Fonds de Recherche du Québec – Société et Culture
- La Fondation canadienne de Recherche sur la Gouvernance
- Le Fonds Famille Jean-Marie-Poitras
- Le Fonds Aida Bairam
- Mitacs

## Avant-propos

Le format de thèse par articles a été privilégié, en conformité avec les règles de la faculté des études supérieures et postdoctorales de l'Université Laval. La présente thèse doctorale est donc composée de trois chapitres/articles distincts partageant un même fil conducteur, auxquels se greffent une introduction générale et une conclusion générale faisant ressortir la cohérence de la démarche.

Je suis l'auteur principal de l'ensemble des articles et je les ai rédigés dans leur intégralité, en bénéficiant des commentaires de trois personnes. Ces dernières sont mes codirectrices de recherche, les professeures Sophie Veilleux et Marie-Josée Roy (coautrices pour les articles 1, 2 et 3), ainsi que la responsable du projet portant sur la gouvernance des PME qui a alimenté le volet empirique à deux segments de cette thèse doctorale, la professeure Maripier Tremblay (coautrice pour les articles 2 et 3).

Le premier article, qui s'intitule *Board of directors and innovation: A systematic literature review from a contingency perspective*, a été présenté lors de la conférence annuelle de la *Academy of Management*, qui s'est déroulée du 29 juillet au 4 août 2021 en ligne. Celui-ci a également été soumis à une revue scientifique de premier plan le 31 décembre 2021.

Le second article, qui s'intitule *The impact of boards of directors' composition, roles, and effectiveness on innovation in small and medium-sized enterprises: A multistage theorization and experimentation*, a été présenté lors de la conférence annuelle de la *Internal Corporate Governance Society*, qui s'est déroulée du 8 au 10 octobre 2021 en ligne. Celui-ci a également été soumis à une revue scientifique de premier plan le 17 avril 2022.

Le troisième article, qui s'intitule *Board-related process and innovation in small and medium-sized enterprises. A continuum logic and configurational approach*, a été présenté lors de la conférence annuelle de la *International Society for Professional Innovation Management*, qui s'est déroulée du 29 novembre au 1<sup>er</sup> décembre 2021 à Valence (Espagne). Celui-ci a également été soumis à une revue scientifique de premier plan le 12 août 2022.

# Introduction générale

## CA et innovation : émergence, évolution et contextualisation

Le concept de gouvernance d'entreprise a été introduit lors de la parution du livre de Berle et Means en 1932 (*The Modern Corporation and Private Property*) dont la thèse centrale concernait les enjeux majeurs en lien avec la séparation de la propriété et du contrôle dans les organisations. Cet ouvrage a posé les bases de la littérature moderne en gouvernance d'entreprise, qui s'est par la suite surtout développée à partir des travaux séminaux de Jensen et Meckling (1976) et de Fama et Jensen (1983) autour de la théorie de l'agence et des mécanismes de contrôle associés au CA.

Parallèlement, la notion d'innovation a été popularisée par l'économiste Joseph Aloïs Schumpeter, notamment à travers la publication de ses travaux en 1934 (*The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*), en 1939 (*Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*) et en 1942 (*Capitalism, Socialism, and Democracy*). Il en a découlé les assises de la théorie de l'innovation contemporaine, qui s'est édifiée sur les réflexions avant-gardistes contenues dans ces manuscrits à propos des caractéristiques et des dynamiques de l'innovation.

Ces deux domaines de recherche ont longtemps évolué de manière concomitante et indépendante. En effet, il aura fallu attendre plus de 50 ans après leur introduction respective pour assister à leur convergence par l'entremise de l'article de Hill et Snell (1988) publié dans la prestigieuse revue scientifique *Strategic Management Journal*. Cette étude s'inscrivait dans un nouveau paradigme en gouvernance d'entreprise, qui a émergé dans les années 60 : la perspective stratégique. Ce complément à la perspective classique de contrôle a orienté vers un potentiel déterminant qui avait été inexploré jusqu'alors par la littérature en innovation : le CA.

À partir des années 90, plusieurs recherches se sont inscrites dans le sillon tracé par Hill et Snell (p. ex. Baysinger et al., 1991; Judge et Zeithaml, 1992; Zahra, 1996). Cette littérature a contribué à l'avancement des connaissances tant dans le domaine de la gouvernance d'entreprise que dans celui de l'innovation. Concrètement, ces travaux ont permis

d'introduire de nouvelles façons de concevoir le fonctionnement et la portée du CA; inspirant par le fait même plusieurs paramètres inédits en lien avec cet organe de gouvernance pouvant stimuler ou freiner l'innovation. Une nouvelle thématique est donc née et celle-ci s'est imposée comme un des sujets les plus prisés dans le domaine de la stratégie, notamment parce que la gouvernance d'entreprise abrite les architectes stratégiques et que l'innovation est de nature stratégique pour les organisations.

Toutefois, plus de 30 ans après le premier article qui s'est intéressé à l'impact du CA sur l'innovation, le besoin de mieux comprendre la manière dont ce lien opère est toujours d'actualité, particulièrement dans le contexte du rôle évolutif du CA. De l'angle de la gouvernance d'entreprise, il est encore difficile de se faire une idée concrète des rouages sous-jacents aux contributions stratégiques du CA étant susceptibles d'influencer l'innovation dans les organisations. Du prisme de l'innovation, les mécanismes à travers lesquels les apports potentiels du CA se matérialisent ne sont pas facilement perceptibles.

Ces constats sont exacerbés dans le contexte des PME, qui a été étudié de manière sporadique (Arzubiaga et al., 2018; Barroso-Castro et al., 2020). Or, les PME forment la majorité des entreprises dans toutes les régions du monde, renferment plusieurs spécificités en matière de gouvernance et tant le CA que l'innovation y sont considérés comme des notions de nature stratégique (Ejdemo et Örtqvist, 2020; Li et al., 2020; OCDE, 2021). À ce jour, les chercheurs en gouvernance d'entreprise (Díaz-Díaz et al., 2022), en innovation (Baum et al., 2022) et en entrepreneuriat (Bauweraerts et al., 2022) s'accordent donc sur le besoin de mieux comprendre le lien entre le CA et l'innovation, surtout dans les PME.

Cette conclusion davantage d'ordre scientifique est aussi reflétée dans la pratique. Les récentes enquêtes diligentées par les cabinets de conseils *KPMG* (2020), *McKinsey* (2021) et *Deloitte* (2021) ont démontré que le lien entre le CA et l'innovation est un sujet prioritaire au sein des organisations en générale et des PME en particulier. Néanmoins, cette observation issue d'enquêtes menées auprès des dirigeants a été produite à partir de statistiques descriptives et exprime surtout la perception de l'utilité d'un CA à des fins d'innovation ou encore la place importante qu'occupe l'innovation dans les discussions du CA sans en mentionner les raisons. Par conséquent, s'il semble certes y avoir une prise de conscience dans le monde des affaires quant au rôle central du CA en innovation, la façon dont celui-ci

se matérialise reste floue et il est aujourd'hui difficile de guider les entreprises dans la gestion de ce lien sur des bases concrètes.

Cette prise de conscience autour de l'intérêt du CA en matière d'innovation que partagent tant la communauté scientifique que le monde des affaires ne semble pas encore avoir complètement imprégné les organismes publics. Le Manuel d'Oslo (2018), qui est produit par l'OCDE, présente un constat général mentionnant que la gouvernance d'entreprise peut influencer les activités d'innovation des organisations (Manuel d'Oslo, 2018, p. 156), mais le CA n'y est pas explicitement évoqué. Pour sa part, la plus récente enquête sur l'innovation et les stratégies d'entreprise menée au Canada (Statistique Canada, 2021) traite de la gouvernance d'entreprise dans une seule question, qui répertorie les différents indicateurs potentiels de l'innovation de processus et qui omet donc complètement sa portée potentielle en matière d'innovation de produit ou de service. Finalement, si la démarche de consultation publique menée dans le cadre de la stratégie québécoise de développement et d'investissement en innovation 2022-2027 (Gouvernement du Québec, 2022) a fait ressortir les enjeux de gouvernance comme un des quatre axes thématiques, les instances de gouvernance d'entreprise n'y sont pas abordées et il y est surtout question de gouvernance publique. En ce sens, le besoin de mieux comprendre la manière dont opère le lien entre le CA et l'innovation constaté au niveau des chercheurs et des dirigeants est une réalité encore plus notable pour les décideurs politiques.

En somme, les trois entités concernées (c.-à-d. chercheurs, dirigeants et décideurs politiques) convergent vers un même besoin, bien que ce soient à des degrés différents : celui de tendre vers une meilleure caractérisation du lien entre le CA et l'innovation, surtout dans le contexte des PME. Ainsi, c'est dans ce contexte ralliant l'ensemble des principaux acteurs économiques de la société qu'a germé l'idée de cette thèse doctorale autour de cette thématique précise.

## **Définition et portée de l'innovation**

Les définitions et les mesures de l'innovation sont abondantes (Bellstam et al., 2020; Dziallas et Blind, 2019; Gault, 2018). Cela est attribuable à divers facteurs, qui sont liés à la richesse de ce concept. D'abord, il existe différents types d'innovation (Damanpour et al., 1989;

Partanen et al., 2014), dont chacun a été mesuré par plusieurs construits (Garcia et Calantone, 2002; Kurzhals et al., 2020). De plus, l'innovation peut s'inscrire à l'intérieur de l'organisation, soit dans une démarche dite « fermée », ou bien dans une forme plus collaborative, considérée comme étant « ouverte » (Damanpour et al., 2018; Hervás-Oliver et al., 2021; Muñoz-Bullón et al., 2020). L'innovation peut aussi être la résultante de deux principales approches, la première étant poussée par la technologie (*technology push*), la seconde se voulant tirée par le marché (*market pull*) (Brem et Voigt, 2009; Guo, et al., 2020). Finalement, l'innovation peut revêtir un caractère radical mettant l'accent sur la nouveauté ou incrémental à travers la notion d'amélioration (Ettlie et al., 1984; Kobarg, et al., 2019; McDermott et O'Connor, 2002). Ces considérations en lien avec l'innovation expliquent la confusion qui règne parfois autour de sa définition.

À ce jour, il est donc admis qu'aucun consensus n'a été atteint sur la définition de l'innovation. Celle qui présente le plus fort potentiel de concorde, tant dans le monde scientifique que politique et celui des affaires, est celle figurant dans la plus récente édition du Manuel d'Oslo (2018) : « *An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)* » (p. 20). Par ailleurs, cette définition de l'innovation fait office de référence au Canada et au Québec, qui constituent le terrain de recherche privilégié pour la section empirique à deux volets de la présente thèse doctorale. En effet, c'est la définition du Manuel d'Oslo qui a été retenue dans la plus récente enquête sur l'innovation et les stratégies d'entreprise menée au Canada (Statistique Canada, 2021). Les principales informations issues de cette enquête, incluant tant les données collectées que la définition de l'innovation, ont également été reprises pour dresser un bilan des activités d'innovation spécifiquement au Québec (Statistique Québec, 2021). En ce sens, la définition de l'innovation dont fait état la version la plus actualisée du Manuel d'Oslo (2018) s'impose naturellement comme le choix le plus optimal dans le cadre de ce travail de recherche.

Une fois ces précisions faites, il convient de s'atteler à cerner la portée de l'innovation afin de mieux en mesurer l'importance. L'intérêt de cette démarche dépasse les frontières organisationnelles. L'innovation ne doit donc pas être abordée uniquement à travers un

prisme économique pour bien en assimiler les ressorts. Il faut notamment relever que son impact est aussi d'ordre sociétal (Bacq et Aguilera, 2022; McGahan et al., 2021), car celle-ci renvoie à des retombées sociales et environnementales (Broadstock et al., 2020; Dey et al., 2020; Sehnem et al., 2022). Cela lui confère le pouvoir de réconcilier des positions considérées comme étant *a priori* antinomiques. Un exemple concret réside dans son influence en matière de triple résultat (c.-à-d., performance financière, sociale et environnementale) (Candi et al., 2019; Longoni et Cagliano, 2018). Dans le même ordre d'idées, alors que le débat en gouvernance d'entreprise entre les tenants de la théorie basée sur les actionnaires (Friedman, 1970) et ceux de la théorie basée sur les parties prenantes (Freeman, 1984) est toujours d'actualité, ces deux courants de pensée antagoniques presque en tout point sont sur la même longueur d'onde eu égard à la pertinence de l'innovation. Ces aspects sociétaux et idéologiques, qui se situent davantage à un niveau d'analyse macro, démontrent que l'innovation revêt un caractère fédérateur et contribue à en faire une retombée organisationnelle à part.

Le fait d'innover renvoie aussi à des enjeux majeurs pour les nations (Bosma et al., 2018; Tellis et al., 2009). Effectivement, la portée de l'innovation a été soulignée de longue date au niveau de toutes les strates géographiques, que ce soit dans un environnement local, régional ou national (Howells, 2005; Parrilli et al., 2020; Van der Have et Rubalcaba, 2016). Cela n'est certainement pas étranger au fait que les entreprises innovantes seraient en meilleure posture pour composer avec la concurrence (Aghion et al., 2005; Keupp et al., 2012; Teece et al., 2016), plus susceptibles d'acquérir un avantage concurrentiel (Crossman et Apaydin, 2010; Lengnick-Hall, 1992; Wu, 2008) et mieux à même de contribuer au développement économique des régions dans lesquelles celles-ci sont implantées (Hasan et Tucci, 2010; Schumpeter, 1934). Ces éléments, qui se situent davantage à un niveau d'analyse méso, illustrent l'influence que peut exercer l'innovation, peu importe le contexte concurrentiel; fût-il géographique ou sectoriel.

Cela étant dit, les bénéfices organisationnels qui sont associés à l'innovation représentent probablement l'aspect le plus édifiant quant à sa portée. La croissance (Coad et al., 2016; Giffin et al., 2021), la performance financière (Piening et Salge, 2015; Zahra et Das, 1993), la productivité (Baumann et Kritikos, 2016; Black et Lynch, 2004), l'internationalisation



(Altomonte et al., 2013; Cassiman et Golovko, 2011) et la profitabilité (Dimitropoulos, 2020; Roberts, 1999) n'en représentent que quelques exemples. L'innovation est donc créatrice de valeur (Bustinza et al., 2019; Sjödin et al., 2020), qui plus est de façon multidimensionnelle, car cette valeur peut prendre des formes diverses et variées. Ces paramètres, qui se situent davantage à un niveau d'analyse micro, sous-entendent des « effets de ruissellement » inhérents à l'innovation.

### **Socle commun des antécédents de l'innovation**

Le caractère transversal de l'innovation, dont témoignent tous les niveaux d'analyse, induit la pertinence, voire la nécessité de circonscrire ses potentiels antécédents. Les travaux qui s'y sont attelés s'accordent, entre autres, sur le besoin d'adopter une approche holistique (Dewangan et Godse, 2014; Edquist, 2019). Cela serait d'autant plus nécessaire sachant que l'innovation est une stratégie très exigeante en matière de ressources (Kannan-Narasimhan et Lawrence, 2018; Klingebiel et Rammer, 2014; Pérez et al., 2019) et que celle-ci émane d'un processus (Appio et al., 2021; Ellwood et al., 2022; Wang et Hu, 2020). À cela s'ajoute le fait que la quête d'innovation représente une initiative par nature risquée et souvent vouée à l'échec (Heidenreich et Kraemer, 2016; Leiponen et Helfat, 2010; Pellegrino et Savona, 2017). Il va sans dire que l'identification des antécédents de l'innovation n'est donc pas chose aisée, ce qui n'a toutefois pas empêché cet axe de recherche de faire l'objet de nombreuses contributions (Davis et al., 2021; Madsen et Leiblein, 2015).

La recherche et développement (R-D) étant reconnue comme un des plus éminents vecteurs d'innovation (Argyres et al., 2020; Baumann et Kritikos, 2016; Scoresby et al., 2021), une étape plutôt intuitive a consisté en la conduite d'analyses à la base de la structure organisationnelle. Cela s'est notamment traduit par un intérêt marqué envers l'impact des employés, et plus précisément des équipes de R-D, sur la capacité des organisations à innover (Garcia Martinez et al., 2017; Razinskas et al., 2022; Tzabbar et Vestal, 2015). Dans cette continuité, les programmes gouvernementaux, tels que ceux qui prennent la forme de crédits d'impôt à la R-D, représentent le principal outil utilisé pour surmonter les obstacles à l'innovation en matière d'accès à un financement externe tant à l'échelle du Canada que celle du Québec (Statistique Canada, 2021; Statistique Québec, 2021). Ces observations suggèrent que les chercheurs, les dirigeants et les décideurs politiques s'accordent sur le fait que la

R-D constitue un paramètre crucial à des fins d'innovation, que ce soit à travers les ressources humaines ou financières qui y sont affectées. Voilà d'ailleurs pourquoi les publications scientifiques, les travaux professionnels et les rapports gouvernementaux se concentrent généralement sur la R-D quand il est question des antécédents de l'innovation.

Cependant, même si les équipes de R-D sont souvent en première ligne en ce qui concerne l'innovation, celles-ci dépendent non seulement des ressources de leurs organisations, mais aussi et surtout de la manière dont ces dernières sont orchestrées (Andersén et Ljungkvist, 2021; Chen et al., 2008). Dans la même veine, de récentes études ont nuancé la portée des initiatives consistant en des incitatifs gouvernementaux à la R-D ayant pour finalité de stimuler l'innovation (Hervás-Oliver et al., 2021; Yi et al., 2021). Par ailleurs, certaines entreprises innovantes ne comptent pas de département dédié exclusivement à la R-D. La plus récente édition du Manuel d'Oslo (2018) s'avère aussi très instructive à ce sujet, en précisant que l'élaboration des politiques d'innovation est aujourd'hui encore largement fondée sur ce qui est le plus facile à mesurer (p. 3) et qu'il n'est pourtant pas rare que l'innovation ne requière pas de R-D (p. 28). Dans cette même lignée, le dernier rapport du *Global Innovation Index* (2021) mentionne que le Canada fait preuve d'inefficience quant au ratio entre les intrants et les extrants d'innovation. Ces faits soutiennent que l'innovation va bien au-delà des investissements en R-D (Papanastassiou et al., 2020; Sierra-Morán et al., 2021). Ainsi, un changement de paradigme, qui se traduit par le besoin d'aller au-delà de la R-D, semble à l'œuvre depuis quelques années.

La tendance à nuancer le poids de la R-D pour générer des extrants d'innovation suggère donc qu'une analyse à la base de la structure organisationnelle, et plus précisément au niveau des membres affectés au département de R-D, est par définition insuffisante bien que nécessaire. Cela signifie que la R-D, malgré son importance, ne semble pas représenter un point de confluence optimal en matière d'antécédents de l'innovation. Encore faut-il proposer des alternatives prometteuses. Dans cette visée, de très récents travaux ont, entre autres, mis en relief la pertinence de certains facteurs tels que les collaborations, les capacités dynamiques et la planification stratégique afin de générer des extrants d'innovation (Dávila et Bendickson, 2021; Ferreira et al., 2021; Hervás-Oliver et al., 2021). Nonobstant la production de résultats mitigés, ces études ont permis l'identification de plusieurs catalyseurs

et inhibiteurs d'innovation. Une piste concordante est qu'aucun stimulus ou frein d'innovation ne peut se prévaloir de l'intervention d'un ou de plusieurs individus. Cela étant dit, l'influence que peuvent exercer les personnes sur l'innovation est tributaire de leur position hiérarchique dans l'entreprise (Keum et See, 2017; Lahiri et al., 2019). En ce sens, il incombe de délimiter les antécédents de l'innovation.

Peu importe les antécédents spécifiques d'innovation, tous les chemins semblent mener au sommet de la hiérarchie organisationnelle. Dès lors, il s'avère pertinent de noter que les instances qui composent la gouvernance d'entreprise exerceraient une influence significative sur le degré d'innovation des organisations (Bacq et Aguilera, 2022; Sapra et al., 2014). Cela s'explique notamment par le fait que les orientations stratégiques de manière générale, et celles qui concernent l'innovation en particulier, sont généralement discutées et entérinées au niveau des échelons supérieurs (Dalziel et al., 2011; Honoré et al., 2015; Jia et al., 2019). De plus, ce seraient aussi les acteurs de la gouvernance d'entreprise qui insufflent la culture d'innovation (Chen et al., 2015; Damanpour, 1991; Deschamps et Nelson, p. 32). Face à ces constats, la chaîne de gouvernance a été un terrain de recherche prolifique à travers les principales instances qu'elle regroupe, en l'occurrence l'actionnariat (Cucculelli et Peruzzi, 2020; Dachs et Peters, 2014; Hoskinsson et al., 2002), le CA (Baum et al., 2021; Bendig et al., 2020; Chang et Wu, 2021) et l'équipe de direction (Boone et al., 2019; Chemmanur et al., 2020; Schubert et Tavassoli, 2020). Une littérature puisant dans la pratique, et plus précisément dans les cas de présidents-directeurs généraux (PDG), a aussi démontré qu'ils sont des acteurs clés en matière d'innovation (Cragun et al., 2020; Dyer et al., 2011, p. 241; He et Hirshleifer, 2022). Toutefois, les contributions de ces diverses composantes de la gouvernance d'entreprise peuvent sensiblement différer étant donné que chacune se doit d'assumer des rôles distincts (Huyn et al., 2022; Kurzhals et al., 2020). Cela soulève une question importante : quel organe de gouvernance faut-il prioritairement cibler quand l'objectif est de circonscrire de potentiels antécédents de l'innovation ?

De récents travaux prenant la forme d'examen exhaustifs de la littérature permettent de répondre à cette interrogation et laissent peu de place à l'ambiguïté. Ceux-ci se sont plus précisément penchés sur les dirigeants stratégiques (c.-à-d. CA, équipes de direction et PDG). Outre le fait de témoigner de l'impact considérable de ces derniers sur l'innovation (Cortes

et Herrmann, 2020; Do Adro et Leitão, 2020; Kurzhals et al., 2020), ces études sont unanimes quant au besoin de s'intéresser davantage au CA quand il est question d'antécédents de l'innovation. Une méta-analyse à l'intersection de ces deux thématiques a très récemment corroboré la pertinence de ce constat et l'a réitéré (Sierra-Morán et al., 2021). Ces recommandations, qui surviennent plus de trois décennies après la parution du premier article portant sur le lien entre le CA et l'innovation (Hill et Snell, 1988), accentuent l'urgence d'alimenter la littérature sur cette thématique. Néanmoins, avant de s'adonner à un tel exercice, il convient de se pencher de manière plus approfondie sur les raisons qui justifient la pertinence d'une telle démarche.

Dans cette optique, il faut d'abord rappeler que le CA est un groupe d'individus élus pour représenter les intérêts des actionnaires ou plus largement ceux des parties prenantes d'une entreprise. Celui-ci bénéficie donc d'une position par nature influente (Garg et Furr, 2017; Kor, 2006; Lungeanu et Zajac, 2019), qui lui impute notamment une responsabilité stratégique (Garg et Eisenhardt, 2017; Pearce et Zahra, 1992; Pugliese et al., 2009). Cette dernière peut se traduire, entre autres, par une implication tant indirecte à travers l'acquisition et l'allocation des ressources (Zhu et Yoshikawa, 2016; Hillman et Dalziel, 2003; Hillman et al., 2008) que directe par la mise en place de conditions propices à l'innovation (Hill et Davis, 2017; Klarner et al., 2020; Schiehl et al., 2018). Ainsi, le CA ne serait pas simplement une ressource précieuse à des fins d'innovation, il s'agirait en fait de l'entité qui donne le ton au niveau de cette stratégie (Chen et al., 2022; Deschamps et Nelson, 2014, p. 44). Le choix de s'intéresser spécifiquement à ce groupe décisionnel est également opportun sachant qu'il représente le plus haut échelon décisionnel interne dans les organisations (Arzubiaga et al., 2018; Bommaraju et al., 2019) et que l'innovation ne suit pas seulement une logique de « bas en haut », mais aussi de « haut en bas » (Deschamps, 2009, p.102; Haneda et Ito, 2018; Kurzhals et al., 2020). De plus, le capital humain du CA représenterait un aspect crucial pour soutenir le processus décisionnel lié aux activités d'innovation (Barroso-Castro et al., 2020; Johnson et al., 2013) et ce serait généralement le CA qui insuffle le degré de risque assumé par les entreprises en ce qui concerne les initiatives innovantes (Sierra-Morán et al., 2021; Wu et Wu, 2014). Ces deux derniers constats prennent toute leur importance sachant que la plus récente enquête canadienne sur l'innovation et les stratégies d'entreprise a révélé que le manque de compétences et l'incertitude/le risque sont de loin les plus grands obstacles à

l'innovation tant à l'échelle du Canada que celle du Québec (Statistique Canada, 2021; Statistique Québec, 2021). Ces éclaircissements issus principalement de la littérature scientifique permettent de mieux comprendre l'intérêt du CA quand il est question d'antécédents de l'innovation.

Au-delà de ces motifs fondés davantage sur des critères scientifiques, plusieurs rapports professionnels et gouvernementaux démontrent la pertinence plus pratique du CA en ce qui concerne l'innovation. Les rapports ministériels du *Ministère Innovation, Sciences et Développement économique Canada* (2020, 2022) relatent certaines initiatives issues d'un projet de loi du parlement canadien visant à stimuler l'innovation, qui porte notamment sur des enjeux autour de la transmission d'informations, de la diversité et des votes au niveau du CA. Pour sa part, un récent rapport du cabinet de conseil en stratégie *McKinsey* (2021) a révélé que l'innovation et la croissance représentent la catégorie de sujets de débat de prédilection au sein du CA; même en temps de crise sanitaire. Les rapports des cabinets d'audit et de conseil *KPMG* (2020) et *Deloitte* (2021) ont quant à eux conclu que le CA jouait un rôle important en matière d'innovation et que l'implication de ce groupe décisionnel au niveau de cette retombée organisationnelle était même un des principaux indicateurs de son efficacité. Dans le contexte québécois, les rapports produits par l'organisme *QuébecInno* (2019, 2020) ont démontré que la majorité des dirigeants des PME québécoises considèrent l'innovation comme étant une priorité et que celles qui sont administrées par un CA sont plus engagées à ce niveau que leurs homologues sans CA; une tendance qui a été maintenue en temps de pandémie. De plus, au cours des dernières années, les organismes dont la mission est de former les administrateurs, à l'instar du *Institute of Corporate Directors* à l'échelle du Canada et du *Collège des administrateurs de sociétés* à l'échelle du Québec, ont multiplié les communiqués mettant l'emphase sur le rôle du CA afin de stimuler l'innovation. Les enjeux autour de cette thématique font d'ailleurs désormais partie intégrante des activités offertes par ces organismes et ont fait l'objet de nombreux articles dans la presse économique (p. ex. *LesAffaires*, *Forbes*, etc.). Ces éléments issus de la pratique soutiennent le bien-fondé d'une démarche qui cible le CA pour tenter d'expliquer le degré d'innovation des organisations.

## **CA et innovation : genèse et problème de recherche**

L'importance respective, mais aussi et surtout réciproque, du CA et de l'innovation pour les organisations, implique qu'un travail à la jonction de ces deux concepts renferme un fort potentiel de contributions tant scientifiques que pratiques. En effet, comme l'ont démontré les lignes précédentes, les enjeux majeurs associés à cette thématique rassemblent tous les acteurs de la société, allant des chercheurs aux décideurs politiques, en passant par les journalistes de la presse économique et les dirigeants des entreprises tant privées que publiques et à but non lucratif.

Malgré tout, le fait de considérer le CA comme un antécédent de l'innovation est assez nouveau et peut paraître insolite. Cela trouve sa source principalement dans les barrières importantes qui nuisent à la compréhension de l'impact potentiel du CA sur l'innovation, notamment celles en matière de théorisation, de conceptualisation, d'opérationnalisation et de contextualisation (Cortes et al., 2021; Kurzhals et al., 2020; Sierra-Morán et al., 2021). Ainsi, en dépit de plusieurs apports qui se sont avérés instructifs, ce lien reste à ce jour peu compris d'un point de vue scientifique, ce qui se répercute dans toutes les autres sphères (c.-à-d. le monde des affaires et les différents paliers gouvernementaux).

Cela implique qu'il faut des piliers solides sur lesquels fonder les trois articles qui composent le cœur de cette thèse doctorale. Ces aspects, qui reflètent les quatre grands défis mentionnés plus tôt (c.-à-d. théorisation, conceptualisation, opérationnalisation et contextualisation), constituent la genèse du présent travail de recherche et permettent de faire ressortir le problème de recherche multidimensionnel que celui-ci s'affaira à résoudre. Le tableau 1 en fait un résumé et les lignes subséquentes les abordent dans le détail.

**Tableau 1.** Piliers, constats et conséquences formant la genèse de cette thèse doctorale

<b>Piliers</b>	<b>Constats</b>	<b>Conséquences</b>
<i>Théorisation</i>	- Prépondérance de la perspective de contrôle (c.-à-d. problèmes d'agence, rôle de surveillance, aversion au risque, horizon à court terme, etc.), qui est par nature davantage en contradiction avec l'innovation, mais reste surreprésentée.	- Compréhension unidimensionnelle et traditionaliste du lien entre le CA et l'innovation.
	- Émergence de la perspective stratégique (c.-à-d. orientations stratégiques, rôle de conseiller, allocation et accès aux ressources, vision à long terme, etc.), qui est davantage en adéquation avec l'innovation, mais reste sous-représentée.	- Faible exploitation du prisme stratégique pour analyser le lien entre le CA et l'innovation, qui permettrait pourtant de repenser le fonctionnement et de redécouvrir les contributions du CA sur la base de nuances théoriques.
<i>Conceptualisation</i>	- Prédilection de la thèse de liens directs et linéaires.	- Compréhension limitée du lien entre le CA et l'innovation.
	- Omission de l'importance des facteurs environnementaux.	- Compréhension étriquée du lien entre le CA et l'innovation.
<i>Opérationnalisation</i>	- Très faible représentation de la méthode qualitative et des études quantitatives basées sur des données primaires.	- Compréhension abstraite du lien entre le CA et l'innovation.
	- Homogénéité en matière de sélection des variables (CA et innovation).	- Compréhension partielle du lien entre le CA et l'innovation.
	- Hétérogénéité en matière de mesure des variables (CA et innovation).	- Compréhension mitigée du lien entre le CA et l'innovation.
<i>Contextualisation</i>	- Littérature axée sur les grandes organisations alors que les PME renferment de nombreuses spécificités en matière de gouvernance (c.-à-d. informalité, faible niveau de problèmes d'agence, etc.).	- Compréhension limitée du lien entre le CA et l'innovation.
	- Nature stratégique de l'innovation et du CA ainsi que prééminence du rôle stratégique du CA dans le contexte des PME.	- Faible exploitation du contexte des PME pour analyser le lien entre le CA et l'innovation, qui permettrait pourtant de repenser le fonctionnement et de redécouvrir les contributions du CA sur la base de nuances contextuelles.

En théorie, la position hiérarchique du CA et la nature de ses rôles induisent un détachement des activités organisationnelles quotidiennes. Son implication au niveau du volet opérationnel se limite donc généralement au contrôle qu'il y exerce (Nielsen et Huse, 2010; Wu et Wu, 2014). Le principal mandat du CA consiste à veiller aux intérêts des actionnaires, notamment en œuvrant pour maximiser le rendement de leurs investissements. Pour ce faire, le CA doit mettre l'accent sur ses tâches de surveillance, afin que les dirigeants n'agissent pas par opportunisme en poursuivant des objectifs à court terme en possible décalage avec ceux des actionnaires. Pour être en adéquation avec l'horizon à long terme qu'il doit préconiser, le CA doit résoudre un grand dilemme (Deschamps et Nelson, 2014, p. 31). D'une part, le CA doit prendre les mesures nécessaires pour que son organisation soit performante et de ce fait démontrer une qualité de la gestion de l'innovation. D'autre part, le CA doit privilégier la stabilité et pour cette raison afficher une réticence pour l'innovation. La seconde occurrence est celle qui est le plus fréquemment observée considérant la domination de la perspective classique de contrôle. En suivant cette logique du fonctionnement du CA, il est donc à priori contre-intuitif de penser que ce groupe décisionnel puisse contribuer à l'innovation étant donné le risque élevé et l'orientation à long terme inhérents à une telle stratégie. Ces faits impliquent qu'à ce jour, nous avons une compréhension traditionaliste et unidimensionnelle du lien entre le CA et l'innovation.

Toutefois, il a été démontré que le CA peut contrecarrer le conservatisme managérial en promouvant une prise de risque calculée et en s'impliquant autrement qu'à travers son rôle de contrôle grâce à sa contribution dans le processus de décision stratégique (Balsmeier et al., 2014; Lu et Wang, 2018). Cela démontre qu'une perspective autre que celle sous-jacente aux postulats classiques en gouvernance d'entreprise découlant de la théorie de l'agence est possible (Baum et al., 2022; Boivie et al., 2021; Kumar et Zattoni, 2019). Il s'agit de la perspective stratégique, dont certains exemples concrets se trouvent dans le fait que le CA peut agir à titre de conseiller pour l'entreprise, lui faciliter l'accès aux ressources et en façonner les orientations stratégiques (Bezemer et al., 2022; Arzubiaga et al., 2018; Pearce and Zahra, 1992). Ces facteurs représentent des pistes d'explication de l'influence potentielle du CA sur l'innovation et suggèrent que la perspective stratégique en lien avec ce groupe décisionnel se prête d'ailleurs mieux à l'étude de cette retombée organisationnelle spécifique dont la nature même est d'ordre stratégique (Boh et al., 2020; Hill et Davis, 2017). Cela étant



dit, beaucoup reste à faire pour bien assimiler la manière dont les contributions stratégiques du CA se matérialisent (Elms et Pugliese, 2022; Panayi et al., 2021), d'autant plus quand il est question d'innovation (Kurzahls et al., 2020; Sierra-Morán et al., 2021). Ces observations révèlent que l'analyse du lien entre le CA et l'innovation à travers un prisme stratégique, qui est à ce jour très peu exploité, permettrait de repenser le fonctionnement et de redécouvrir les contributions de cette instance de gouvernance sur la base de nuances théoriques.

Au-delà de ces enjeux en matière de théorisation, un autre point concerne les enjeux de conceptualisation. Cet élément renvoie aux cadres analytiques mobilisés par la littérature portant sur le lien entre le CA et l'innovation. Cela se traduit plus précisément par le fait qu'un nombre réduit d'études ait examiné les interactions entre différentes caractéristiques du CA (p. ex. composition et rôles); privilégiant ainsi l'hypothèse d'un lien direct entre ces dernières et l'innovation (Kurzahls et al., 2020; Sierra-Morán et al., 2021). Ce constat s'avère d'autant plus problématique sachant que ce seraient davantage des liens indirects (Arzubíaga et al., 2018; Robeson et O'Connor, 2013; Zattoni et al., 2015) et des combinaisons de facteurs (García-Ramos et Díaz, 2021; Schiehl et al., 2018) qui régiraient l'influence du CA sur l'innovation.

Cette tendance à négliger la complexité qui s'impose dans l'étude de ce phénomène se traduit aussi par l'omission des caractéristiques environnementales (Balsmeier et al., 2014; Sierra-Morán et al., 2021; Zona et al., 2013). Or, la gouvernance d'entreprise peut sensiblement différer d'un contexte à un autre (Boyd et al., 2017; Roelandt et al., 2021) et l'innovation requiert tant des ressources internes que des ressources externes (Gurtner et Reinhardt, 2016; Piening et Salge, 2015). En d'autres termes, ni le CA ni le processus d'innovation ne sont imperméables à leur environnement (Mittra et al., 2021; Wu et Wu, 2014; Zahra et Pearce, 1989).

En plus de ces considérations théoriques et conceptuelles, la difficulté à décortiquer la manière dont opère le lien entre le CA et l'innovation trouve également sa source dans des aspects d'ordre méthodologique. Il s'agit plus précisément des conséquences liées aux choix des méthodes empiriques et à l'opérationnalisation des variables. En ce qui concerne les méthodes empiriques, les travaux en gouvernance d'entreprise ont rarement eu recours à la recherche qualitative (Boyd et al., 2017; McNulty et al., 2013). Un constat similaire a été

établi récemment en ce qui a trait spécifiquement aux études qui se sont intéressées à l'impact potentiel du CA sur la performance financière (García-Ramos et Díaz, 2021) et l'innovation (Klarner et al., 2020). Cela est notamment attribuable au défi que représente l'accès aux différentes instances de gouvernance; particulièrement au CA (Leblanc et Shwartz, 2007; Pugliese et al., 2015; Veltrop et al., 2021). Cette rareté caractérise aussi plus largement les études en gouvernance d'entreprise basées sur des données primaires (Arzubiaga et al., 2018; Klijn et al., 2019; Minichilli et al., 2009). Ces aspects impliquent qu'à ce jour, nous avons une compréhension abstraite du lien entre le CA et l'innovation.

Quant à l'opérationnalisation des variables, la littérature portant sur le lien entre le CA et l'innovation est caractérisée par une homogénéité en matière de sélection des variables à travers une focalisation sur la composition du CA (Johnson et al., 2013; Vandembroucke et al., 2016) et l'utilisation récurrente des investissements en R-D pour mesurer l'innovation (Baum et al., 2022; Sierra-Morán et al., 2021). Toutefois, l'analyse de la composition du CA ne crée pas des conditions optimales pour expliquer une retombée organisationnelle comme l'innovation et la R-D ne peut prétendre capturer cette dernière. Par conséquent, de nombreuses caractéristiques du CA et de formes d'innovation restent sous-étudiées (Balsmeier et al., 2017; Baum et al., 2022; Robeson et O'Connor, 2013). Ces faits se reflètent dans la pratique, car les guides, codes et pratiques de saine gouvernance sont en grande partie articulés autour de variables structurelles du CA (Mutlu et al., 2018; Witt et al., 2021). Aussi, les initiatives des organisations et des gouvernements visant à stimuler l'innovation ont tendance à se limiter à la promotion des investissements en R-D. Ces points soulignent qu'à ce jour, nous avons une compréhension partielle du lien entre le CA et l'innovation.

Toujours en matière d'opérationnalisation, certains auteurs ont évoqué l'existence d'une hétérogénéité plutôt que d'une homogénéité quant à la mesure de plusieurs variables tant indépendantes (c.-à-d. en lien avec le CA) que dépendantes (c.-à-d. en lien avec l'innovation) (Sierra-Morán et al., 2021; Kor, 2006; Zona et al., 2013). En d'autres termes, pour de mêmes concepts, les chercheurs ont eu recours à une diversité d'indicateurs. Ces éléments peuvent en partie expliquer les résultats mitigés dont fait état la littérature à la jonction du CA et de l'innovation (Arzubiaga et al., 2018; Honoré et al., 2015; Matzler et al., 2015). Ces

observations suggèrent qu'à ce jour, nous avons une compréhension mitigée du lien entre le CA et l'innovation.

D'un point de vue contextuel, la littérature en gouvernance d'entreprise témoigne d'un écart important entre le nombre d'études menées dans le contexte des PME par rapport aux grandes organisations (Arzubiaga et al., 2018; Gnan et al., 2015; Puthusserry et al., 2021). Cela peut s'expliquer, entre autres, par le fait que la gouvernance s'y inscrit davantage dans une approche informelle (Brunninge et al., 2007; Calabrò et Mussolino, 2013; Zahra et Filatotchev, 2004). De plus, la théorie autour de laquelle s'est développé le domaine de la gouvernance d'entreprise (c.-à-d. théorie de l'agence) et toutes ses considérations sous-jacentes (p. ex. rôle de contrôle, asymétrie d'informations, comportements opportunistes, etc.) se prêtent moins bien aux PME, car le CA y est surtout considéré comme un complément à l'équipe de direction plutôt qu'un mécanisme visant à neutraliser les problèmes d'agence (Bammens et al., 2011; Gnan et al., 2015; Zahra et Fialotchev, 2004). En ce sens, les connaissances disponibles reflètent davantage la réalité des grandes organisations et ne peuvent être transposées aux PME étant donné les spécificités qui caractérisent ces dernières en matière de gouvernance. Cela s'avère d'autant plus problématique sachant que les PME constituent la portion majoritaire des entreprises dans toutes les régions du monde, en plus d'être un des principaux stimulus de la croissance économique des pays (Mínguez-Vera et Martin, 2011; Van Gils, 2005). Ces faits dévoilent qu'à ce jour, nous avons une compréhension exiguë du lien entre le CA et l'innovation.

Néanmoins, l'importance de la gouvernance d'entreprise pour les PME a été établie (Huse, 2000; Vandembroucke et al., 2016). Le CA y est parfois considéré comme une ressource peu conventionnelle, mais aussi une potentielle ressource stratégique (Arzubiaga et al., 2018; Puthusserry et al., 2021). Par ailleurs, si le caractère stratégique de l'innovation pour les PME a été soutenu empiriquement (Madrid-Guijarro et al., 2013; Ejdemo et Örtqvist, 2020), ces dernières peuvent assumer moins de coûts et de risque que les grandes organisations (Barrett et al., 2021; Werner et al., 2018). La R-D n'y est généralement pas un outil commun (Baum et al., 2022), ce qui confirme l'intérêt de s'intéresser à d'autres ressources telles que le CA. Ainsi, tandis que la stratégie peut sembler incompatible avec la culture informelle et la vision à court terme généralement observable dans le contexte des PME, la perspective stratégique

au niveau du CA y serait pourtant prépondérante (Brunninge et al., 2007; Roffia et al., 2021). Ces aspects dénotent que l'analyse du lien entre le CA et l'innovation dans le contexte des PME, qui est à ce jour très peu exploitée, permettrait pourtant de repenser le fonctionnement et de redécouvrir les contributions de cet organe de gouvernance sur la base de nuances contextuelles.

### **CA et innovation : objectifs, questions et articulations**

À la lumière de l'ensemble de ces considérations, la présente thèse doctorale a donc pour ambition première de tendre vers une compréhension substantielle du lien entre le CA et l'innovation, particulièrement dans le contexte des PME, au profit des chercheurs, des dirigeants et des décideurs politiques.

La question de recherche générale qui en découle va comme suit : quel est l'impact du CA sur l'innovation et de quelle manière ce lien opère-t-il dans le contexte des PME ? La réalisation de ce principal objectif et la réponse à cette question de recherche générale passent par l'atteinte de trois objectifs spécifiques, qui sont traités dans le cadre de chapitres/articles distincts.

Le premier objectif spécifique consiste à circonscrire les antécédents de l'innovation en se focalisant sur le CA tout en considérant les facteurs environnementaux pouvant potentiellement modérer ou médier ce lien. Le premier chapitre/article prend donc la forme d'une revue systématique de la littérature menant au tout premier cadre conceptuel intégrateur du lien entre le CA et l'innovation sous une perspective de contingence.

Le tableau 2 résume l'objectif et les trois sous-objectifs tandis que le tableau 3 présente une série de huit principales recommandations qui en sont issues et qui ont inspiré l'architecture de la section empirique à deux volets de la présente thèse doctorale.

**Tableau 2.** Objectif et sous-objectifs spécifiques de recherche de l'article 1

Objectif	Sous-objectifs
<ul style="list-style-type: none"> <li>- Circonscrire les antécédents de l'innovation en se focalisant sur le CA tout en considérant les facteurs environnementaux pouvant potentiellement modérer ou médier ce lien.</li> </ul>	<ul style="list-style-type: none"> <li>- Mettre en relief les caractéristiques du CA qui ont un impact significatif sur l'innovation;</li> <li>- Relever les facteurs environnementaux internes et externes qui ont un impact significatif sur l'innovation et qui pourraient en ce sens potentiellement modérer ou médier ce lien;</li> <li>- Émettre des recommandations au profit des chercheurs, des dirigeants et des décideurs politiques.</li> </ul>

**Tableau 3.** Principales recommandations issues de l'article 1

Catégories	Constats
<i>Théorique/Conceptuel</i>	<ul style="list-style-type: none"> <li>- Transcender les fondements théoriques traditionnels en gouvernance (notamment ceux en lien avec la théorie de l'agence).</li> <li>- Édifier des cadres analytiques qui intègrent la complexité qui s'impose, notamment en s'émancipant de la thèse d'un lien direct et linéaire ainsi qu'en accordant davantage d'importance aux facteurs environnementaux.</li> </ul>
<i>Méthodologique/Empirique</i>	<ul style="list-style-type: none"> <li>- Introduire une composante qualitative ou se baser sur des données primaires.</li> <li>- Recourir à des méthodes statistiques autres que les régressions.</li> <li>- Analyser les PME plutôt que les grandes organisations; en n'écartant pas le secteur financier.</li> <li>- Opter pour des terrains de recherche autres que celui des États-Unis.</li> <li>- Mobiliser des variables originales par rapport à la littérature actuelle tant pour les caractéristiques du CA que pour mesurer l'innovation.</li> <li>- Faire preuve de prudence quant aux raccourcis statistiques dans l'opérationnalisation des concepts.</li> </ul>

Le second objectif spécifique consiste à théoriser et à expérimenter l'impact des effets d'interactions de différentes facettes du CA (c.-à-d. composition, rôles et efficacité) sur l'innovation.

La composition du CA y est représentée par sa taille, son indépendance et son capital humain. Les rôles du CA sont ceux de contrôle et de stratégie. L'efficacité du CA réfère à l'historique de ses contributions organisationnelles. L'innovation est opérationnalisée par l'innovation interne de produits/services.

De plus, diverses variables de contrôle sont incluses (c.-à-d. taille, âge, secteur, performance financière et internationalisation des PME).

Le tableau 4 résume l'objectif et les six sous-objectifs de l'article 2 tandis que le tableau 5 démontre la manière dont celui-ci traite les huit principaux constats issus de l'article 1.

**Tableau 4.** Objectif et sous-objectifs de recherche de l'article 2

Objectif	Sous-objectifs
- Théoriser et expérimenter l'impact des effets d'interaction de différentes facettes du CA (c.-à-d. composition, rôles et efficacité) sur l'innovation (c.-à-d. innovation interne de produits/services) dans le contexte des PME tout en accordant une place importante aux facteurs environnementaux.	<ul style="list-style-type: none"> <li>- Analyser l'impact de la taille et de l'indépendance du CA sur le capital humain du CA;</li> <li>- Analyser l'impact du capital humain du CA sur les rôles de contrôle et de stratégie du CA;</li> <li>- Analyser l'impact des rôles de contrôle et de stratégie du CA sur l'efficacité du CA;</li> <li>- Analyser l'impact de l'efficacité du CA sur l'innovation;</li> <li>- Analyser l'impact de la taille, de l'âge, du secteur, de la performance financière et de l'internationalisation des PME sur l'innovation;</li> <li>- Émettre des recommandations au profit des chercheurs, des dirigeants et des décideurs politiques.</li> </ul>

**Tableau 5.** Traitement des recommandations issues de l'article 1 dans l'article 2

Recommandations (article 1)	Traitements (article 2)
- Transcender les fondements théoriques traditionnels en gouvernance (notamment ceux en lien avec la théorie de l'agence).	- Mobilisation des postulats de plusieurs théories (c.-à-d. de l'agence, basée sur les ressources, de dépendance envers les ressources et de la contingence).
- Édifier des cadres analytiques qui intègrent la complexité qui s'impose, notamment en s'émancipant de la thèse d'un lien direct et linéaire ainsi qu'en accordant davantage d'importance aux facteurs environnementaux.	- Cadre analytique fondé sur un processus séquentiel et multiphasique en quatre étapes; considération de trois liens de médiation; inclusion de cinq variables de contrôle (c.-à-d. taille, âge, secteur, performance financière et internationalisation des PME).
- Introduire une composante qualitative ou au moins se baser sur des données primaires.	- Données collectées sur la base d'une enquête menée par l'entremise d'une agence de sondage.
- Recourir à d'autres méthodes statistiques que les régressions.	- Résultats produits sur la base de quatre modèles d'équations structurelles.
- Analyser les PME plutôt que les grandes organisations; en n'écartant pas le secteur financier.	- Échantillon constitué de 300 PME œuvrant dans diverses industries.
- Opter pour des terrains de recherche autres que celui des États-Unis.	- Zone géographique privilégiée : le territoire du Québec (Canada).
- Mobiliser des variables originales par rapport à la littérature actuelle tant pour les caractéristiques du CA que pour mesurer l'innovation.	- Considération du capital humain et de l'efficacité du CA ainsi que mesure de l'innovation par l'innovation interne de produits/services.
- Faire preuve de prudence quant aux raccourcis statistiques dans l'opérationnalisation des concepts.	- Opérationnalisation rigoureuse pour l'ensemble des variables (p. ex. analyse factorielle exploratoire et confirmatoire, aucune extrapolation et variété d'indicateurs appuyant la validité des données.)

Le troisième objectif spécifique vise à théoriser et à expérimenter l'impact des effets combinés de divers processus liés au CA (c.-à-d. établissement, intégration, centralisation et bureaucratie), toujours en matière d'innovation et dans le contexte des PME.

Le processus d'établissement réfère au processus décisionnel et aux motivations sous-jacentes à l'initiative d'instaurer un CA. Le processus d'intégration concerne le processus derrière la mise en place de conditions optimales afin d'accompagner les administrateurs. Le processus de centralisation consiste en un processus de concentration du pouvoir au sein du CA. Le processus de bureaucratie traduit un processus d'enlissement des administrateurs dans

des procédés administratifs. L'innovation y est encore une fois opérationnalisée par l'innovation interne de produits/services.

Le cadre analytique mobilisé inclut également certaines caractéristiques organisationnelles (c.-à-d. taille et âge) permettant de prendre en compte le niveau de croissance bidimensionnelle des PME.

Le tableau 6 résume l'objectif et les six sous-objectifs de ce troisième chapitre/article tandis que le tableau 7 en illustre le traitement de la série de huit principaux constats issus de l'article 1.

**Tableau 6.** Objectif et sous-objectifs de recherche de l'article 3

<b>Objectif</b>	<b>Sous-objectifs</b>
- Théoriser et expérimenter l'impact des effets combinés de divers processus liés au CA (c.-à-d. établissement, intégration, centralisation et bureaucratie), toujours par rapport à l'innovation (c.-à-d. innovation interne de produits/services), dans le contexte des PME et en accordant une place importante aux facteurs environnementaux.	- Analyser la pertinence du processus d'établissement; - Analyser la pertinence du processus d'intégration; - Analyser la pertinence du processus de centralisation; - Analyser la pertinence du processus de bureaucratie; - Analyser la pertinence du niveau de croissance bidimensionnelle des PME par rapport à l'innovation; - Émettre des recommandations au profit des chercheurs, des dirigeants et des décideurs politiques.



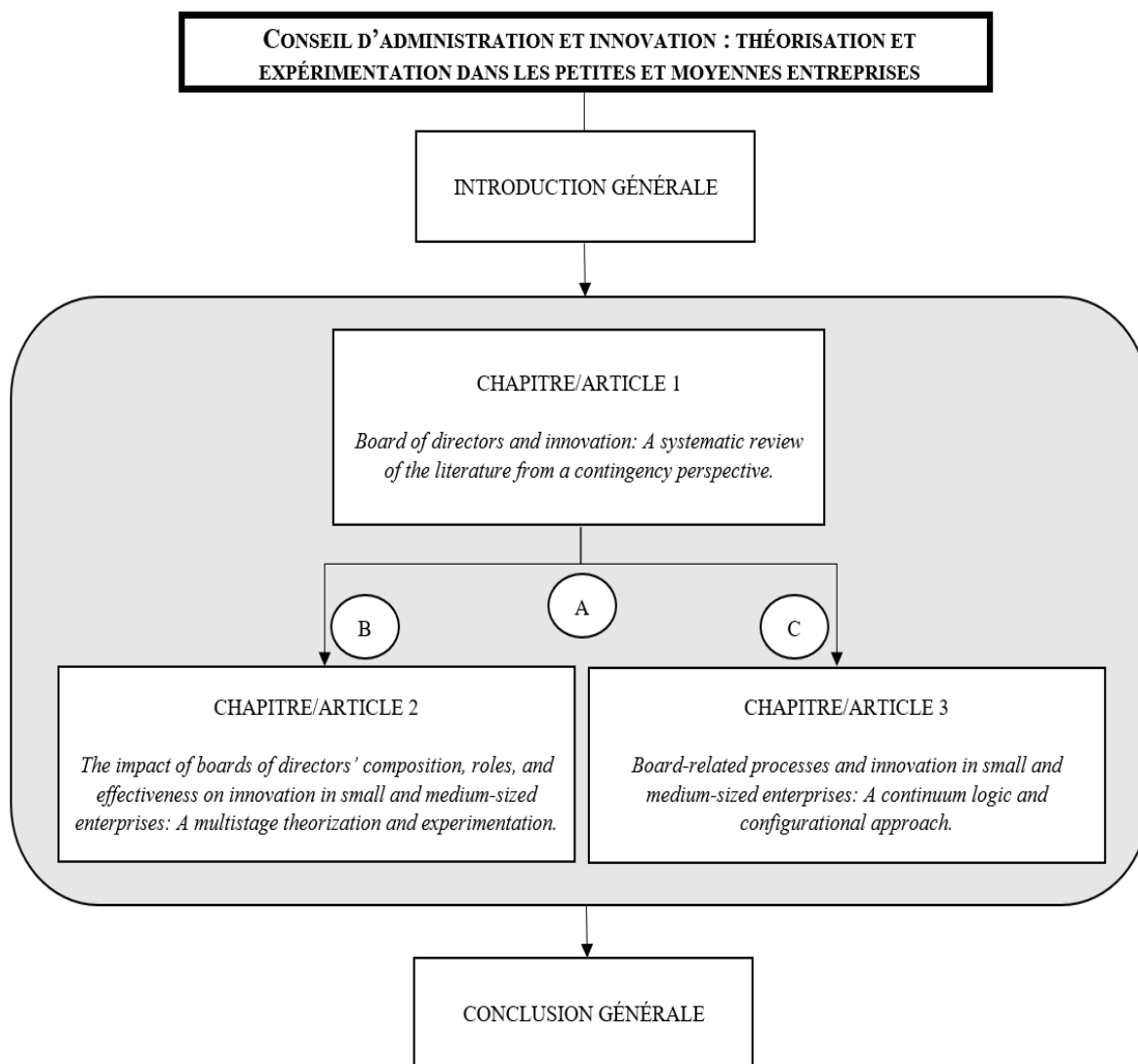
**Tableau 7.** Traitement des recommandations issues de l'article 1 dans l'article 3

Recommandations (article 1)	Traitements (article 3)
- Transcender les fondements théoriques traditionnels en gouvernance (notamment ceux en lien avec la théorie de l'agence).	- Mobilisation des postulats de diverses théories (c.-à-d. basée sur les ressources, de dépendance envers les ressources, de la complexité, des parties prenantes et de la contingence).
- Édifier des cadres analytiques qui intègrent la complexité qui s'impose, notamment en s'émancipant de la thèse d'un lien direct et linéaire ainsi qu'en accordant davantage d'importance aux facteurs environnementaux.	- Logique de continuum pour analyser les processus en lien avec le CA; approche configurationnelle pour tester les propositions; considération de la taille et de l'âge des PME (niveau de croissance bidimensionnelle).
- Introduire une composante qualitative ou se baser sur des données primaires.	- Intégration d'un volet qualitatif à travers l'utilisation de la méthode FsQCA.
- Recourir à des tests statistiques plus sophistiqués que des régressions.	- Identification de combinaisons de facteurs plutôt que de facteurs isolés grâce à la méthode FsQCA.
- Analyser les PME plutôt que les grandes organisations, en n'écartant pas le secteur financier.	- Échantillon constitué de 300 PME œuvrant dans diverses industries.
- Opter pour des terrains de recherche autres que celui des États-Unis.	- Zone géographique privilégiée : le territoire du Québec (Canada).
- Mobiliser des variables originales par rapport à la littérature actuelle tant pour les caractéristiques du CA que pour mesurer l'innovation.	- Analyse de quatre processus originaux en lien avec le CA ainsi que mesure de l'innovation par l'innovation interne de produits/services.
- Faire preuve de prudence quant aux raccourcis statistiques dans l'opérationnalisation des concepts.	- Tests statistiques rigoureux pour l'ensemble des variables (p. ex. analyse factorielle exploratoire et confirmatoire, aucune extrapolation, calibration la plus restrictive et variété d'indicateurs appuyant la validité des données).

La figure 1 résume la structure de cette thèse doctorale. Les « connecteurs logiques » A (se référer aux tableaux 2 et 3), B (se référer aux tableaux 4 et 5) et C (se référer aux tableaux 6 et 7) en démontrent le fil conducteur. Ces aspects témoignent du fait que les principaux constats issus du volet conceptuel (c.-à-d. premier chapitre/article) ont tous été intégrés, sans aucune exception, dans la démarche préconisée au niveau du volet empirique (deuxième et troisième chapitres/articles). Cette introduction générale laissera place à la présentation des trois articles, qui feront l'objet de chapitres distincts. Puis, un retour succinct sur les

principales contributions, limites et pistes de recherches futures, fera office de conclusion générale.

**Figure 1.** Structure de la thèse doctorale



### **Bibliographie (introduction générale)**

- Aghion, P., Bloom, N., Blundell, R., Griffith, R., & Howitt, P. (2005). Competition and innovation: An inverted-U relationship. *The Quarterly Journal of Economics*, 120, 701-728.
- Altomonte, C., Aquilante, T., Békés, G., & Ottaviano, G. I. (2013). Internationalization and innovation of firms: evidence and policy. *Economic Policy*, 28, 663-700.

- Andersén, J., & Ljungkvist, T. (2021). Resource orchestration for team-based innovation: a case study of the interplay between teams, customers, and top management. *R&D Management*, 51, 147-160.
- Appio, F. P., Frattini, F., Petruzzelli, A. M., & Neirotti, P. (2021). Digital transformation and innovation management: A synthesis of existing research and an agenda for future studies. *Journal of Product Innovation Management*, 38, 4-20.
- Argyres, N., Rios, L. A., & Silverman, B. S. (2020). Organizational change and the dynamics of innovation: Formal R&D structure and intrafirm inventor networks. *Strategic Management Journal*, 41, 2015-2049.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Bacq, S., & Aguilera, R. V. (2022). Stakeholder governance for responsible innovation: A theory of value creation, appropriation, and distribution. *Journal of Management Studies*, 59, 29-60.
- Balsmeier, B., Buchwald, A., & Stiebale, J. (2014). Outside directors on the board and innovative firm performance. *Research Policy*, 43, 1800-1815.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Bammens, Y., Voordeckers, W., & Van Gils, A. (2011). Boards of directors in family businesses: A literature review and research agenda. *International Journal of Management Reviews*, 13, 134-152.
- Barrett, G., Dooley, L., & Bogue, J. (2021). Open innovation within high-tech SMEs: A study of the entrepreneurial founder's influence on open innovation practices. *Technovation*, 103, 102232.
- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Baum, C. F., Lööf, H., Stephan, A., & Viklund-Ros, I. (2022). Innovation by start-up firms: The role of the board of directors for knowledge spillovers. *Research Policy*, 51, 104375.
- Baumann, J., & Kritikos, A. S. (2016). The link between R&D, innovation and productivity: Are micro firms different?. *Research Policy*, 45, 1263-1274.
- Bauweraerts, J., Rondi, E., Rovelli, P., De Massis, A., & Sciascia, S. (2022). Are family female directors catalysts of innovation in family small and medium enterprises?. *Strategic Entrepreneurship Journal* (in press).
- Baysinger, B. D., Kosnik, R. D., & Turk, T. A. (1991). Effects of board and ownership structure on corporate R&D strategy. *Academy of Management Journal*, 34, 205-214.
- Bellstam, G., Bhagat, S., & Cookson, J. A. (2021). A text-based analysis of corporate innovation. *Management Science*, 67, 4004-4031.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Berle, A.A., Means, G.C., 1932. *The Modern Corporation and Private Property*, New York.
- Bezemer, P. J., Pugliese, A., Nicholson, G., & Zattoni, A. (2022). Toward a synthesis of the board-strategy relationship: A literature review and future research agenda. *Corporate Governance: An International Review* (in press).

- Black, S. E., & Lynch, L. M. (2004). What's driving the new economy?: The benefits of workplace innovation. *The Economic Journal*, 114, 97-116.
- Boh, W. F., Huang, C. J., & Wu, A. (2020). Investor experience and innovation performance: The mediating role of external cooperation. *Strategic Management Journal*, 41, 124-151.
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.
- Bommaraju, R., Ahearne, M., Krause, R., & Tirunillai, S. (2019). Does a customer on the board of directors affect business-to-business firm performance?. *Journal of Marketing*, 83, 8-23.
- Boone, C., Lokshin, B., Guenter, H., & Belderbos, R. (2019). Top management team nationality diversity, corporate entrepreneurship, and innovation in multinational firms. *Strategic Management Journal*, 40, 277-302.
- Bosma, N., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, 51, 483-499.
- Boyd, B. K., Gove, S., & Solarino, A. M. (2017). Methodological rigor of corporate governance studies: A review and recommendations for future studies. *Corporate Governance: An International Review*, 25, 384-396.
- Brem, A., & Voigt, K. I. (2009). Integration of market pull and technology push in the corporate front end and innovation management—Insights from the German software industry. *Technovation*, 29, 351-367.
- Broadstock, D. C., Matousek, R., Meyer, M., & Tzeremes, N. G. (2020). Does corporate social responsibility impact firms' innovation capacity? The indirect link between environmental & social governance implementation and innovation performance. *Journal of Business Research*, 119, 99-110.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Bustinza, O. F., Gomes, E., Vendrell-Herrero, F., & Baines, T. (2019). Product–service innovation and performance: the role of collaborative partnerships and R&D intensity. *R&D Management*, 49, 33-45.
- Calabrò, A., & Mussolino, D. (2013). How do boards of directors contribute to family SME export intensity? The role of formal and informal governance mechanisms. *Journal of Management & Governance*, 17, 363-403.
- Candi, M., Melia, M., & Colurcio, M. (2019). Two birds with one stone: The quest for addressing both business goals and social needs with innovation. *Journal of Business Ethics*, 160, 1019-1033.
- Cassiman, B., & Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42, 56-75.
- Chen, S., Bu, M., Wu, S., & Liang, X. (2015). How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance. *Journal of Business Research*, 68, 1127-1135.
- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.

- Chemmanur, T. J., Gupta, M., & Simonyan, K. (2022). Top management team quality and innovation in venture-backed private firms and IPO market rewards to innovative activity. *Entrepreneurship Theory and Practice*, 46, 920-951.
- Chen, I. J., Hsu, P. H., & Wang, Y. (2022). Staggered boards and product innovations: Evidence from Massachusetts State Bill HB 5640. *Research Policy*, 51, 104475.
- Coad, A., Segarra, A., & Teruel, M. (2016). Innovation and firm growth: does firm age play a role?. *Research Policy*, 45, 387-400.
- Cortes, A. F., & Herrmann, P. (2020). CEO transformational leadership and SME innovation: The mediating role of social capital and employee participation. *International Journal of Innovation Management*, 24, 2050024.
- Cortes, A. F., & Herrmann, P. (2021). Strategic leadership of innovation: a framework for future research. *International Journal of Management Reviews*, 23, 224-243.
- Cragun, O. R., Olsen, K. J., & Wright, P. M. (2020). Making CEO narcissism research great: A review and meta-analysis of CEO narcissism. *Journal of Management*, 46, 908-936.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154-1191.
- Cucculelli, M., & Peruzzi, V. (2020). Innovation over the industry life-cycle. Does ownership matter?. *Research Policy*, 49, 103878.
- Dachs, B., & Peters, B. (2014). Innovation, employment growth, and foreign ownership of firms: A European perspective. *Research Policy*, 43, 214-232.
- Dalziel, T., Gentry, R. J., & Bowerman, M. (2011). An integrated agency–resource dependence view of the influence of directors' human and relational capital on firms' R&D spending. *Journal of Management Studies*, 48, 1217-1242.
- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34, 555-590.
- Damanpour, F., Sanchez-Henriquez, F., & Chiu, H. H. (2018). Internal and external sources and the adoption of innovations in organizations. *British Journal of Management*, 29, 712-730.
- Damanpour, F., Szabat, K. A., & Evan, W. M. (1989). The relationship between types of innovation and organizational performance. *Journal of Management Studies*, 26, 587-602.
- Dachs, B., & Peters, B. (2014). Innovation, employment growth, and foreign ownership of firms: A European perspective. *Research Policy*, 43, 214-232.
- Davis, P. E., & Bendickson, J. S. (2021). Strategic antecedents of innovation: Variance between small and large firms. *Journal of Small Business Management*, 59, 47-72.
- Deloitte (2020, december). 2021 Directors' alert: A new era of board stewardship begins. Disponible à travers le lien suivant : <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/audit/ca-en-Deloitte-DirectorsAlert-Edition1-AODA.pdf>.
- Deschamps, J. P. (2009). *Innovation leaders: How senior executives stimulate, steer and sustain innovation*. John Wiley & Sons.
- Deschamps, J. P., & Nelson, B. (2014). *Innovation governance: How top management organizes and mobilizes for innovation*. John Wiley & Sons.
- Dewangan, V., & Godse, M. (2014). Towards a holistic enterprise innovation performance measurement system. *Technovation*, 34, 536-545.

- Dey, P. K., Malesios, C., De, D., Chowdhury, S., & Abdelaziz, F. B. (2020). The impact of lean management practices and sustainably-oriented innovation on sustainability performance of small and medium-sized enterprises: empirical evidence from the UK. *British Journal of Management*, 31, 141-161.
- Díaz-Díaz, N. L., López-Iturriaga, F. J., & Santana-Martín, D. J. (2022). The role of political ties and political uncertainty in corporate innovation. *Long Range Planning*, 55, 102111.
- Dimitropoulos, P. E. (2020). R&D investments and profitability during the crisis: evidence from Greece. *R&D Management*, 50, 587-598.
- Do Adro, F. J. N., & Leitão, J. C. C. (2020). Leadership and organizational innovation in the third sector: A systematic literature review. *International Journal of Innovation Studies*, 4, 51-67.
- Dyer, J., Gregersen, H., & Christensen, C. M. (2011). *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators*. Harvard Business Press.
- Dziallas, M., & Blind, K. (2019). Innovation indicators throughout the innovation process: An extensive literature analysis. *Technovation*, 80, 3-29.
- Edquist, C. (2019). Towards a holistic innovation policy: Can the Swedish National Innovation Council (NIC) be a role model?. *Research Policy*, 48, 869-879.
- Ejdemo, T., & Örtqvist, D. (2020). Related variety as a driver of regional innovation and entrepreneurship: A moderated and mediated model with non-linear effects. *Research Policy*, 49, 104073.
- Ellwood, P., Williams, C., & Egan, J. (2022). Crossing the valley of death: Five underlying innovation processes. *Technovation*, 109, 102162.
- Elms, N., & Pugliese, A. (2022). Director tenure and contribution to board task performance: A time and contingency perspective. *Long Range Planning* (in press), 102217.
- Ettlie, J. E., Bridges, W. P., & O'keefe, R. D. (1984). Organization strategy and structural differences for radical versus incremental innovation. *Management Science*, 30, 682-695.
- Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26, 301-325.
- Freeman, R. E. 1984. *Strategic Management: A Stakeholder Approach*, Boston: Pitman Publishing Inc.
- Friedman, M. (1970). A theoretical framework for monetary analysis. *Journal of Political Economy*, 78, 193-238.
- Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: A literature review. *Journal of Product Innovation Management*, 19, 110-132.
- Garcia Martinez, M., Zouaghi, F., & Garcia Marco, T. (2017). Diversity is strategy: the effect of R&D team diversity on innovative performance. *R&D Management*, 47, 311-329.
- García-Ramos, R., & Díaz, B. D. (2021). Board of directors structure and firm financial performance: A qualitative comparative analysis. *Long Range Planning*, 54, 102017.
- Garg, S., & Furr, N. (2017). Venture boards: Past insights, future directions, and transition to public firm boards. *Strategic Entrepreneurship Journal*, 11, 326-343.
- Gault, F. (2018). Defining and measuring innovation in all sectors of the economy. *Research Policy*, 47, 617-622.
- Gouvernement du Québec (2022, mai). *Inventer, Développer, Commercialiser : Stratégie québécoise de développement et d'investissement en innovation 2022-2027*.

Disponible à travers le lien suivant :  
<https://www.quebec.ca/gouvernement/ministere/economie/publications/strategie-quebecoise-de-recherche-et-dinvestissement-en-innovation-2022-2027>

- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Griffin, D., Li, K., & Xu, T. (2021). Board gender diversity and corporate innovation: International evidence. *Journal of Financial and Quantitative Analysis*, 56, 123-154.
- Guo, H., Wang, C., Su, Z., & Wang, D. (2020). Technology push or market pull? Strategic orientation in business model design and digital start-up performance. *Journal of Product Innovation Management*, 37, 352-372.
- Gurtner, S., & Reinhardt, R. (2016). Ambidextrous idea generation—Antecedents and outcomes. *Journal of Product Innovation Management*, 33, 34-54.
- Haneda, S., & Ito, K. (2018). Organizational and human resource management and innovation: which management practices are linked to product and/or process innovation?. *Research Policy*, 47, 194-208.
- Hasan, I., & Tucci, C. L. (2010). The innovation—economic growth nexus: Global evidence. *Research Policy*, 39, 1264-1276.
- He, Z., & Hirshleifer, D. (2022). The exploratory mindset and corporate innovation. *Journal of Financial and Quantitative Analysis*, 57, 127-169.
- Heidenreich, S., & Kraemer, T. (2016). Innovations—doomed to fail? Investigating strategies to overcome passive innovation resistance. *Journal of Product Innovation Management*, 33, 277-297.
- Hervás-Oliver, J. L., Parrilli, M. D., Rodríguez-Pose, A., & Sempere-Ripoll, F. (2021). The drivers of SME innovation in the regions of the EU. *Research Policy*, 50, 104316.
- Hill, C. W., & Snell, S. A. (1988). External control, corporate strategy, and firm performance in research-intensive industries. *Strategic Management Journal*, 9, 577-590.
- Hill, L. A., & Davis, G. (2017). The board's new innovation imperative. *Harvard Business Review*, 95, 102-109.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28, 383-396.
- Hillman, A. J., Nicholson, G., & Shropshire, C. (2008). Directors' multiple identities, identification, and board monitoring and resource provision. *Organization Science*, 19, 441-456.
- Honoré, F., Munari, F., & de La Potterie, B. V. P. (2015). Corporate governance practices and companies' R&D intensity: Evidence from European countries. *Research Policy*, 44, 533-543.
- Huynh, K., Wilden, R., & Gudergan, S. (2022). The interface of the top management team and the board: A dynamic managerial capabilities perspective. *Long Range Planning* (in press), 102194.
- Howells, J. (2005). Innovation and regional economic development: A matter of perspective?. *Research Policy*, 34, 1220-1234.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3, 305-360.

- Jia, N., Huang, K. G., & Man Zhang, C. (2019). Public governance, corporate governance, and firm innovation: An examination of state-owned enterprises. *Academy of Management Journal*, 62, 220-247.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Judge Jr, W. Q., & Zeithaml, C. P. (1992). Institutional and strategic choice perspectives on board involvement in the strategic decision process. *Academy of Management Journal*, 35, 766-794.
- Kannan-Narasimhan, R., & Lawrence, B. S. (2018). How innovators reframe resources in the strategy-making process to gain innovation adoption. *Strategic Management Journal*, 39, 720-758.
- Keum, D. D., & See, K. E. (2017). The influence of hierarchy on idea generation and selection in the innovation process. *Organization Science*, 28, 653-669.
- Keupp, M. M., Palmié, M., & Gassmann, O. (2012). The strategic management of innovation: A systematic review and paths for future research. *International Journal of Management Reviews*, 14, 367-390.
- Klijjn, E., Reuer, J. J., Volberda, H. W., & Van Den Bosch, F. A. (2019). Ex-post governance in joint ventures: Determinants of monitoring by JV boards of directors. *Long Range Planning*, 52, 72-85.
- Klarner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Klingebiel, R., & Rammer, C. (2014). Resource allocation strategy for innovation portfolio management. *Strategic Management Journal*, 35, 246-268.
- Kobarg, S., Stumpf-Wollersheim, J., & Welp, I. M. (2019). More is not always better: Effects of collaboration breadth and depth on radical and incremental innovation performance at the project level. *Research Policy*, 48, 1-10.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- KPMG (2020, septembre). Innovation trends 2020. KPMG Digital Delta. Disponible à travers le lien suivant : <https://assets.kpmg/content/dam/kpmg/au/pdf/2020/digital-innovation-trends-survey-2020.pdf>.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Lahiri, A., Pahnke, E. C., Howard, M. D., & Boeker, W. (2019). Collaboration and informal hierarchy in innovation teams: Product introductions in entrepreneurial ventures. *Strategic Entrepreneurship Journal*, 13, 326-358.
- Leblanc, R., & Schwartz, M. S. (2007). The black box of board process: Gaining access to a difficult subject. *Corporate Governance: An International Review*, 15, 843-851.
- Leiponen, A., & Helfat, C. E. (2010). Innovation objectives, knowledge sources, and the benefits of breadth. *Strategic Management Journal*, 31, 224-236.



- Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18, 399-429.
- Longoni, A., & Cagliano, R. (2018). Sustainable innovativeness and the triple bottom line: The role of organizational time perspective. *Journal of Business Ethics*, 151, 1097-1120.
- Lu, J., & Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, 48, 1-16.
- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & Van Auken, H. (2013). An investigation of Spanish SME innovation during different economic conditions. *Journal of Small Business Management*, 51, 578-601.
- Madsen, T. L., & Leiblein, M. J. (2015). What factors affect the persistence of an innovation advantage?. *Journal of Management Studies*, 52, 1097-1127.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The impact of family ownership, management, and governance on innovation. *Journal of Product Innovation Management*, 32, 319-333.
- McDermott, C. M., & O'Connor, G. C. (2002). Managing radical innovation: an overview of emergent strategy issues. *Journal of Product Innovation Management*, 19, 424-438.
- McGahan, A. M., Bogers, M. L., Chesbrough, H., & Holgersson, M. (2021). Tackling societal challenges with open innovation. *California Management Review*, 63, 49-61.
- McKinsey (2021). McKinsey Global Survey. Disponible à travers le lien suivant : <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/ourinsights/how-boards-have-risen-to-the-covid-19-challenge-and-whats-next>.
- McNulty, T., Zattoni, A., & Douglas, T. (2013). Developing corporate governance research through qualitative methods: A review of previous studies. *Corporate Governance: An International Review*, 21, 183-198.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.
- Ministère Innovation, Sciences et Développement économique Canada (2020, décembre). Rapport sur les résultats ministériel 2019-2020. Disponible à travers le lien suivant : <https://dec.canada.ca/fr/publications-ministerielles/rapport-sur-les-resultats-ministeriel-2019-2020/>.
- Ministère Innovation, Sciences et Développement économique Canada (2022, février). Rapport sur les résultats ministériel 2020-2021. Disponible à travers le lien suivant : <https://dec.canada.ca/fr/publications-ministerielles/rapport-sur-les-resultats-ministeriels-2020-2021/>
- Mitra, A., Post, C., & Sauerwald, S. (2021). Evaluating board candidates: A threat-contingency model of shareholder dissent against female director candidates. *Organization Science*, 32, 86-110.
- Muñoz-Bullón, F., Sanchez-Bueno, M. J., & De Massis, A. (2020). Combining internal and external R&D: The effects on innovation performance in family and nonfamily firms. *Entrepreneurship Theory and Practice*, 44, 996-1031.
- Mutlu, C. C., Van Essen, M., Peng, M. W., Saleh, S. F., & Duran, P. (2018). Corporate governance in China: A meta-analysis. *Journal of Management Studies*, 55, 943-979.

- Nielsen, S., & Huse, M. (2010). The contribution of women on boards of directors: Going beyond the surface. *Corporate Governance: An International Review*, 18, 136-148.
- Oslo Manual/OECD (2018). *Guidelines for Collecting, Reporting and Using Data on Innovation*; OECD Publishing: Paris, France.
- Panayi, E., Bozos, K., & Veronesi, G. (2021). Corporate governance “bundles” and firm acquisitiveness. *Corporate Governance: An International Review*, 29, 402-426.
- Papanastassiou, M., Pearce, R., & Zanfei, A. (2020). Changing perspectives on the internationalization of R&D and innovation by multinational enterprises: A review of the literature. *Journal of International Business Studies*, 51, 623-664.
- Parrilli, M. D., Balavac, M., & Radicic, D. (2020). Business innovation modes and their impact on innovation outputs: Regional variations and the nature of innovation across EU regions. *Research Policy*, 49, 104047.
- Partanen, J., Chetty, S. K., & Rajala, A. (2014). Innovation types and network relationships. *Entrepreneurship Theory and Practice*, 38, 1027-1055.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pellegrino, G., & Savona, M. (2017). No money, no honey? Financial versus knowledge and demand constraints on innovation. *Research Policy*, 46, 510-521.
- Pérez, J. A. H., Geldes, C., Kunc, M. H., & Flores, A. (2019). New approach to the innovation process in emerging economies: The manufacturing sector case in Chile and Peru. *Technovation*, 79, 35-55.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Pugliese, A., Bezemer, P. J., Zattoni, A., Huse, M., Van den Bosch, F. A., & Volberda, H. W. (2009). Boards of directors' contribution to strategy: A literature review and research agenda. *Corporate Governance: An International Review*, 17, 292-306.
- Pugliese, A., Nicholson, G., & Bezemer, P. J. (2015). An observational analysis of the impact of board dynamics and directors' participation on perceived board effectiveness. *British Journal of Management*, 26, 1-25.
- Puthusserry, P., Khan, Z., Nair, S. R., & King, T. (2021). Mitigating psychic distance and enhancing internationalization of fintech SMEs from emerging markets: the role of board of directors. *British Journal of Management*, 32, 1097-1120.
- Razinskas, S., Weiss, M., Hoegl, M., & Baer, M. (2022). Illuminating opposing performance effects of stressors in innovation teams. *Journal of Product Innovation Management*, 39, 351-370.
- Roberts, P. W. (1999). Product innovation, product–market competition and persistent profitability in the US pharmaceutical industry. *Strategic Management Journal*, 20, 655-670.
- Robeson, D., & O'Connor, G. C. (2013). Boards of directors, innovation, and performance: An exploration at multiple levels. *Journal of Product Innovation Management*, 30, 608-625.
- Roelandt, J., Andries, P., & Knockaert, M. (2022). The contribution of board experience to opportunity development in high-tech ventures. *Small Business Economics*, 58, 1627-1645.

- Roffia, P., Simón-Moya, V., & Sendra García, J. (2021). Board of director attributes: effects on financial performance in SMEs. *International Entrepreneurship and Management Journal*, 1-32.
- Sapra, H., Subramanian, A., & Subramanian, K. V. (2014). Corporate governance and innovation: Theory and evidence. *Journal of Financial and Quantitative Analysis*, 49, 957-1003.
- Schiehll, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Schumpeter, J.A. (1934) *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press, Cambridge, MA.
- Schumpeter, J. A. (1939), *Business Cycle*, p. 103, McGraw-Hill Book Company, New York.
- Schumpeter, J. A. (1942). *Capitalism, Socialism, and Democracy*, pp. 511–528. Harper, New York.
- Schubert, T., & Tavassoli, S. (2020). Product innovation and educational diversity in top and middle management teams. *Academy of Management Journal*, 63, 272-294.
- Scoresby, R. B., Withers, M. C., & Ireland, R. D. (2021). The effect of CEO regulatory focus on changes to investments in R&D. *Journal of Product Innovation Management*, 38, 401-420.
- Sehnm, S., Provensi, T., da Silva, T. H. H., & Pereira, S. C. F. (2022). Disruptive innovation and circularity in start-ups: A path to sustainable development. *Business Strategy and the Environment*, 31, 1292-1307.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly* (in press),
- Sjödin, D., Parida, V., Jovanovic, M., & Visnjic, I. (2020). Value creation and value capture alignment in business model innovation: A process view on outcome-based business models. *Journal of Product Innovation Management*, 37, 158-183.
- Statistique Canada (2021, 27 juillet). *Enquête sur l'innovation et les stratégies d'entreprise, 2017 à 2019*. Statistique Canada. Disponible à travers le lien suivant : <https://www150.statcan.gc.ca/n1/pub/12-604-x/12-604-x2021001-fra.htm>.
- Statistique Québec (2021, 16 décembre). *L'innovation dans les entreprises du Québec en 2017-2019*. Statistique Québec. Disponible à travers le lien suivant : <https://statistique.quebec.ca/fr/document/innovation-entreprises-quebec-2017-2019>.
- Tzabbar, D., & Vestal, A. (2015). Bridging the social chasm in geographically distributed R&D teams: The moderating effects of relational strength and status asymmetry on the novelty of team innovation. *Organization Science*, 26, 811-829.
- Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58, 13-35.
- Tellis, G. J., Prabhu, J. C., & Chandy, R. K. (2009). Radical innovation across nations: The preeminence of corporate culture. *Journal of Marketing*, 73, 3-23.
- Vandenbroucke, E., Knockaert, M., & Ucbasaran, D. (2016). Outside board human capital and early stage high-tech firm performance. *Entrepreneurship Theory and Practice*, 40, 759-779.

- Van der Have, R. P., & Rubalcaba, L. (2016). Social innovation research: An emerging area of innovation studies?. *Research Policy*, 45, 1923-1935.
- Veltrop, D. B., Bezemer, P. J., Nicholson, G., & Pugliese, A. (2021). Too unsafe to monitor? How board–CEO cognitive conflict and chair leadership shape outside director monitoring. *Academy of Management Journal*, 64, 207-234.
- Wang, C., & Hu, Q. (2020). Knowledge sharing in supply chain networks: Effects of collaborative innovation activities and capability on innovation performance. *Technovation*, 94, 102010.
- Werner, A., Schröder, C., & Chlosta, S. (2018). Driving factors of innovation in family and non-family SMEs. *Small Business Economics*, 50, 201-218.
- Witt, M. A., Fainshmidt, S., & Aguilera, R. V. (2022). Our board, our rules: Nonconformity to global corporate governance norms. *Administrative Science Quarterly*, 67, 131-166.
- World Intellectual Property Organization (2021, septembre). The 2021 edition of the GII. Disponible à travers le lien suivant : [https://www.wipo.int/global\\_innovation\\_index/en/](https://www.wipo.int/global_innovation_index/en/).
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yi, J., Murphree, M., Meng, S., & Li, S. (2021). The more the merrier? Chinese government R&D subsidies, dependence, and firm innovation performance. *Journal of Product Innovation Management*, 38, 289-310.
- Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, 39, 1713-1735.
- Zahra, S. A., & Das, S. R. (1993). Innovation strategy and financial performance in manufacturing companies: An empirical study. *Production and Operations Management*, 2, 15-37.
- Zahra, S. A., & Filatotchev, I. (2004). Governance of the entrepreneurial threshold firm: A knowledge-based perspective. *Journal of Management Studies*, 41, 885-897.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zhu, H., & Yoshikawa, T. (2016). Contingent value of director identification: The role of government directors in monitoring and resource provision in an emerging economy. *Strategic Management Journal*, 37, 1787-1807.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24, 299-315.

# **Chapitre 1 : Article 1 - Board of directors and innovation: A systematic literature review from a contingency perspective**

## **1.1. Résumé**

Le lien entre le CA et l'innovation a bénéficié d'un intérêt croissant de la part de la communauté scientifique, du monde des affaires et des instances gouvernementales au cours des dernières années. Néanmoins, celui-ci reste peu compris, notamment en raison des limites en termes de cadres analytiques, de fondements théoriques et de designs méthodologiques; ainsi qu'à l'absence d'une approche mettant en relief l'importance des contingences. En ce sens, une synthèse de la littérature s'avère nécessaire, non seulement dans le but de tendre vers une meilleure compréhension de ce lien, mais aussi et surtout pour poser de solides fondations sur lesquelles pourront bâtir les recherches futures. La démarche préconisée a ultimement permis l'émergence d'un cadre conceptuel intégrateur sous une perspective de contingence, qui fournit une théorisation du lien entre le CA et l'innovation, et de proposer un agenda de recherche. Ainsi, cette étude renferme des contributions tant scientifiques que pratiques.

**Mots-clés :** Conseil d'administration; Innovation; Contingence; Revue systématique.

## **1.2. Abstract**

The link between the BoD and innovation has received increasing interest from scholars, executives, and policymakers in recent years. Nevertheless, it remains somewhat cryptic, especially due to limitations regarding analytical frameworks, theoretical constructs, and methodological designs, as well as the absence of an approach that highlights the importance of contingencies. In this regard, a systematic literature review is required not only to gain a better understanding of this link, but also to lay a solid foundation on which to build future research. The approach adopted in this study has led to the emergence of an integrative conceptual framework from a contingency perspective that provides theorization about the link between the BoD and innovation, and a promising research agenda. Thus, this study contains both scientific and practical contributions.

**Keywords:** Board of directors; Innovation; Contingency; Systematic review.

### **1.3. Introduction**

BoD are influential decision-making groups (Jensen and Zajac, 2004; Kor, 2006; Lungeanu and Zajac, 2019). This influence is reflected in the many roles assigned to this governance body. In addition to their traditional monitoring/controlling role, directors are expected to advise their organization, shape its strategic direction, and facilitate access to the resources it requires (Arzubiaga et al., 2018; Hillman and Dalziel, 2003; Johnson et al., 1996; Pearce and Zahra, 1992; Pugliese et al., 2009). These elements provide a better understanding of the potential tangible contributions of the BoD regarding organizational outcomes such as innovation (Hill and Davis, 2017; Klarner et al., 2020; Wu and Wu, 2014).

The decision to focus specifically on innovation is justified by its scope for organizations. Innovation allows firms to increase their growth (Coad et al., 2016; Griffin et al., 2021), financial performance (Hung and Chou, 2013; Piening and Salge, 2015), productivity (Baumann and Kritikos, 2016; Black and Lynch, 2004), profitability (Roberts, 1999), and market share (Banbury and Mitchell, 1995; Dangelico, 2016), particularly at the international level (Cassiman and Golovko, 2011). As a result, innovative firms contribute to economic growth (Hasan and Tucci, 2010) and are usually more competitive (Lengnick-Hall, 1992, Chang and Wu, 2021). Innovation is also closely linked to organizations' survival (Cefis and Marsili, 2006), especially in times of crisis (Cefis and Marsili, 2019), and it provides a certain degree of sustainability (Kor, 2006; Kurzhals et al., 2020; Zahra, 1996). It is therefore not an option, but rather a requirement for contemporary enterprises.

The respective importance of the BoD and innovation indicates the relevance of a study aimed at analyzing the literature that bridges these two concepts. Undertaking such an initiative with a systematic literature review is supported by four main points.

The first is that despite the presence of literature reviews on the BoD investigating various aspects such as its roles (Åberg et al., 2019; Johnson et al., 1996), its gender diversity (Baker et al. 2020, 2018; Kirsch, 2018), its impact on financial performance (Erhardt et al., 2003; Nguyen et al., 2020) and its strategic contributions (Bezemer et al., 2022; Schaedler et al., 2021; Pugliese et al., 2009), no such review has yet specifically addressed the influence of the BoD on innovation. There are three exceptions: articles by Gonzales-Bustos and

Hernández-Lara (2016), Kurzhals et al. (2020), Sierra-Morán et al. (2021). However, the first studies corporate governance in its broadest sense, which implies that the BoD is only partially considered. This observation is also valid for the second article, as it focuses on corporate governance at large, as well as on a specific type of innovation: technological innovation. The third article uses a meta-analytic approach, which confines it to reducing its analytical framework by focusing exclusively on variables related to structural and demographical characteristics of the BoD. These elements imply that, to date, it is difficult to obtain a global view of the impact of the BoD on innovation to derive a holistic understanding of this link. Given the plethora of benefits for organizations associated with innovation and the strategic involvement expected from the BoD, which can result in its influence on this specific organizational outcome, it is important to undertake an exhaustive literature review to demystify the underlying elements at the junction of these two concepts and to strive for a more substantial understanding of their association.

The second main point justifying the relevance of this paper concerns the inconsistency of empirical results at the junction of the BoD and innovation. A good example of this is the mixed results produced by studies examining board independence. The benefits associated with independent directors, such as providing different perspectives, access to resources, and better innovation performance, have been widely supported (Balsmeier et al., 2014; Chen and Hsu, 2009; Lu and Wang, 2019). However, independent directors could also represent a hindrance in terms of both innovation inputs (Kor, 2006) and outputs (Zahra, 1996), and inside directors could be beneficial for innovation purposes (Baysinger et al., 1991; Dalziel et al., 2011). In addition to these contradictory results, some studies have been unable to establish any significant link between board independence and innovation (David et al., 2001). Thus, it is fundamental to alleviate the confusion emanating from this disparity in findings regarding the impact of the BoD on innovation. Our approach allows us to tackle this issue by highlighting the underlying elements between BoD variables and innovation, for example, by revealing that board independence is of little relevance in itself, but takes all its importance in light of other aspects, such as the fact of increasing the level of experience and extending the network of the BoD.



The third major element justifying the relevance of the present article concerns theoretical redundancy in research on the link between the BoD and innovation. This trend is reflected by a strong tendency to rely on the postulates of agency theory (Arzubiaga et al., 2018; Zona, 2016), whose premises have repeatedly failed to link boards to organizational performance and, more specifically, to innovation (Kor, 2006; Bravo and Reguera-Alvarado, 2017). Agency theory also suggests a rather hostile position to innovation, given the concepts of control and risk aversion associated with it (Eisenhardt, 1989; Jensen and Meckling, 1976). As such, an extensive synthesis of the literature on the impact of the BoD on innovation provides the opportunity to review the theories that previous studies have relied on to display those with the highest potential and eventually also propose theoretical alternatives, which is particularly needed in the field of corporate governance (Cuomo et al., 2016; Kumar and Zattoni, 2019).

The fourth major point supporting the relevance of this study relates to the many methodological limitations reported in the literature regarding the potential influence of the BoD on innovation. One of these limitations lies in the homogeneity of the variables used. This is particularly reflected in the recurrent measurement of innovation through investment in R&D (Kor, 2006; Zona et al., 2013). However, this indicator has been contested on the grounds that it represents an innovation input and is therefore a reflection of efforts to innovate, which do not guarantee innovation outputs (Miller and Triana, 2009; Zahra, 1996). The problem with the homogeneity of the variables also concerns the independent variables related to BoD' concepts (Balsmeier et al., 2014; Sierra-Morán et al., 2021). These observations suggest the need for a detailed investigation to guide future research in the design of its analytical framework by helping to avoid reproducing the same mistakes in terms of variable choices and measures, as well as providing concrete examples of the most promising concepts that should be studied in the future. Another element related to the limitations in methodology and, more generally, in the architecture of the analytical frameworks, is the omission of contingencies. This is problematic given that innovation results from various sources and that the BoD is not impermeable to its environment (Wu and Wu, 2014; Zahra and Pearce, 1989). This paper incorporates this element by adopting a contingency perspective to strive for a holistic view of the link between the BoD and innovation, thereby ensuring that our findings and recommendations consider the relevance

of different contextual factors that can significantly alter the impact of the BoD on innovation.

In light of these considerations, the present article is structured around three main objectives: (1) outlining BoD variables that serve as vectors of innovation; (2) identifying BoD variables that inhibit innovation; and (3) highlighting other concepts related to firms' internal and external environments that could potentially mediate or moderate the impact of the BoD on innovation. This process gave rise to an integrative conceptual framework regarding the link between the BoD and innovation from a contingency perspective, and to a promising research agenda to guide future studies in this specific field of research.

In general, this makes it possible to propose the first conceptual framework analyzing the link between two crucial concepts for any organization (i.e., BoD and innovation), which provides a detailed mapping of this literature and a thorough understanding of the mechanisms at their junction. More specifically, our approach allows us not only to circumscribe the most important explanatory factors regarding the impact of the BoD on innovation, but also to consider the various contextual factors that may cause this link to fluctuate. In doing so, it becomes possible to establish a large number of observations and to issue several recommendations that fuel the debate around this theme. This study also contains concrete courses of action when the objective is to stimulate innovation regarding the BoD specifically and, more broadly, different factors of internal and external environments with which organizations have to deal on a daily basis. Therefore, the present research is not only relevant from a scientific point of view, but it will also find resonance among the business world and policy makers.

The following section outlines the methodology used in this study, after which the results and the integrative conceptual framework are presented. The subsequent section contains a research agenda and details the contributions. Finally, some limitations are described before issuing brief concluding remarks.

## **1.4. Methodology**

### **1.4.1. Systematic approach**

Systematic reviews of the literature differ from other types of reviews (e.g., narrative literature reviews and scoping literature reviews) in the stringency of the selection and analysis to which articles are subjected (Kitchenham, 2004; Moher et al., 2015). This results in a process that is replicable, scientific, and transparent (Snyder, 2019; Staples and Niazi, 2007), thereby reducing potential biases, such as certain studies being ignored (Post et al., 2020; Snyder, 2019). A systematic literature review is particularly well suited to a relatively new topic for which the findings are mixed (Paul and Criado, 2020; Torraco, 2016). These characteristics describe the literature on the link between the BoD and innovation, which further justifies the interest of our approach. The systematic review protocol consists of five steps (Ceipek et al., 2019; Denyer and Tranfield, 2009; Tranfield et al., 2003): (1) formulating one or more research questions, (2) identifying and locating studies, (3) selecting and evaluating the studies, (4) analyzing and summarizing the studies, and (5) communicating and using the results of the studies.

### **1.4.2. Formulating one or more research questions**

A systematic review makes it possible to align the results with the research question (Post et al., 2020; Snyder, 2019). This study is articulated around the following research question: Which board-level concepts have a significant impact (positive or negative) on innovation, and which contingencies could potentially moderate or mediate this link? The approach focuses on the BoD, but also acknowledges that directors are not impervious to their firms' internal and external contextual factors. This angle allows to analyze the BoD in-depth while bringing some nuance to the thesis stating that this governance body has a direct impact on innovation. It integrates the complexity that is inherent in this link by giving importance to aspects that go beyond the BoD through the consideration of various contingency factors, as well as providing the basis for a fine-grained examination to highlight the underlying elements that explain the causal relationships between different concepts related to directors and innovation. This ultimately enables us to go further than a simple overview of previous studies on this topic.

### **1.4.3. Identifying and locating relevant studies**

The first two databases selected to identify the studies for inclusion in our analysis are specialized in the field of business administration (ABI/Inform Global and Business Source Premier by EBSCO), while the third contains articles from scientific journals in all domains (Web of Science). This choice was made with the help of a consulting librarian specializing in the field of business administration. In accordance with the approach prescribed by various authors (e.g., Crossan and Apaydin, 2010; Denyer and Tranfield, 2009; Tranfield et al., 2003), the search for studies in these three databases was carried out using titles, abstracts, and keywords/subjects.

Once the databases were selected, a chain of keywords was created to conduct the searches (Ma et al., 2020; Yoon et al., 2020). This was also conducted in accordance with the recommendations of a consulting librarian, as well as on the basis of previous work by the research team and various interactions between the latter and corporate governance experts. The board was represented by the keyword chain: (board\* OR director\*). This made it possible to consider all the different designations used to refer to the BoD (e.g., board of directors, boardroom, and directors). Innovation was represented by the following keyword chain: (innovat\* OR “R&D” OR “research and development” OR “incremental” OR radical\* OR patent\* OR citation\*). These terms made it possible to consider any type of innovation, whether as an input (e.g., the intensity of R&D investment) or output (e.g., the number of patents), as well as both its improvement (through the concept “incremental”) and more disruptive nature (through the term “radical”). Thus, the complete keyword chain used in the three databases for a search of titles, abstracts, and keywords/subjects was as follows: (board\* OR director\*) AND (innovat\* OR “R&D” OR “research and development” OR “incremental” OR radical\* OR patent\* OR citation\*).

### **1.4.4. Applying the inclusion and exclusion criteria**

A key step that contributes significantly to the rigour and transparency of the analysis is the definition of inclusion and exclusion criteria (Kitchenham, 2004; Moher et al., 2015; Snyder, 2019; Tranfield et al., 2003). The first three criteria of inclusion/exclusion (temporality, language, and type) were applied directly in each of the three databases using their tools. The two other criteria (method and quality) were applied in the Endnote software following the

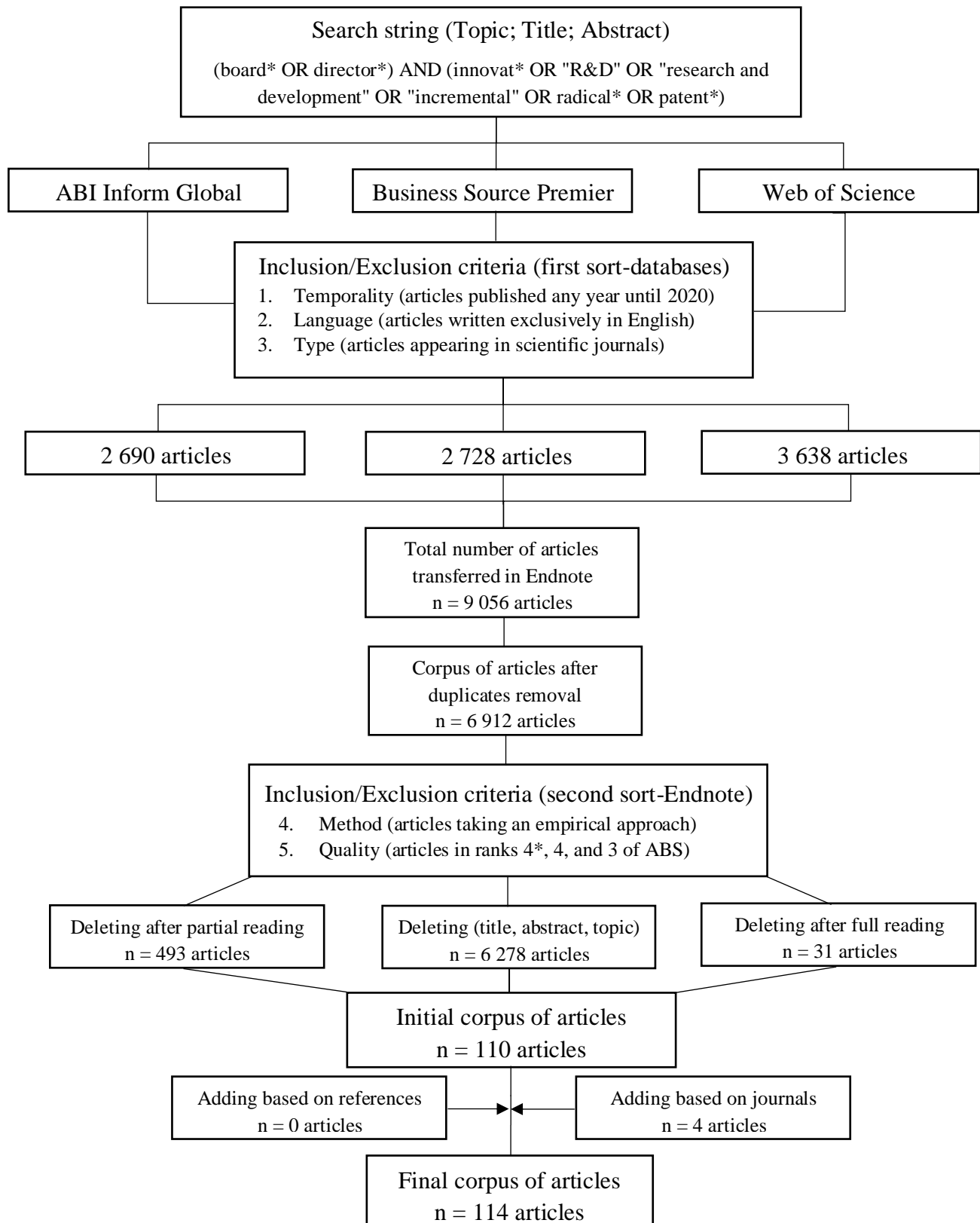
transfer of all the articles that met the first three criteria and after deleting duplicates. Table 8 summarizes the five inclusion/exclusion criteria used to filter the studies.

**Table 8.** Summary of the inclusion/exclusion criteria

<b>Criteria</b>	<b>Inclusion</b>	<b>Exclusion</b>
<i>1. Temporality</i>	All years until 2021	All years after 2021
<i>2. Language</i>	Exclusively English	All other languages
<i>3. Type</i>	Scientific (peer-reviewed)	All other types (e.g., book chapters and thesis)
<i>4. Method</i>	Empirical (quantitative/qualitative/mix)	All other methods (e.g., theoretical/conceptual)
<i>5. Quality</i>	Ranks 4*, 4 and 3 of the ABS	Ranks 1, 2 as well as non-ranked by the ABS

A manual search was then carried out in two steps. A “snowball approach” that consisted of analyzing the references of each article in the initial body of studies resulted in the addition of one article. A manual search was also conducted in the six scientific journals with the most articles published on the subject (i.e., *Journal of Business Research* (14/114); *Corporate Governance: An International Review* [6/114]; *Journal of Product Innovation Management* [6/114]; *Business Strategy and the Environment* [6/114]; *Academy of Management* [5/114]; *Journal of Financial Economics* [5/114]). The research protocol used to form the final body of studies is summarized in Figure 2 and follows the latest recommendations in this regard, particularly in terms of transparency of the selection process (Post et al., 2020; Snyder, 2019).

**Figure 2.** Summary of the systematic review protocol



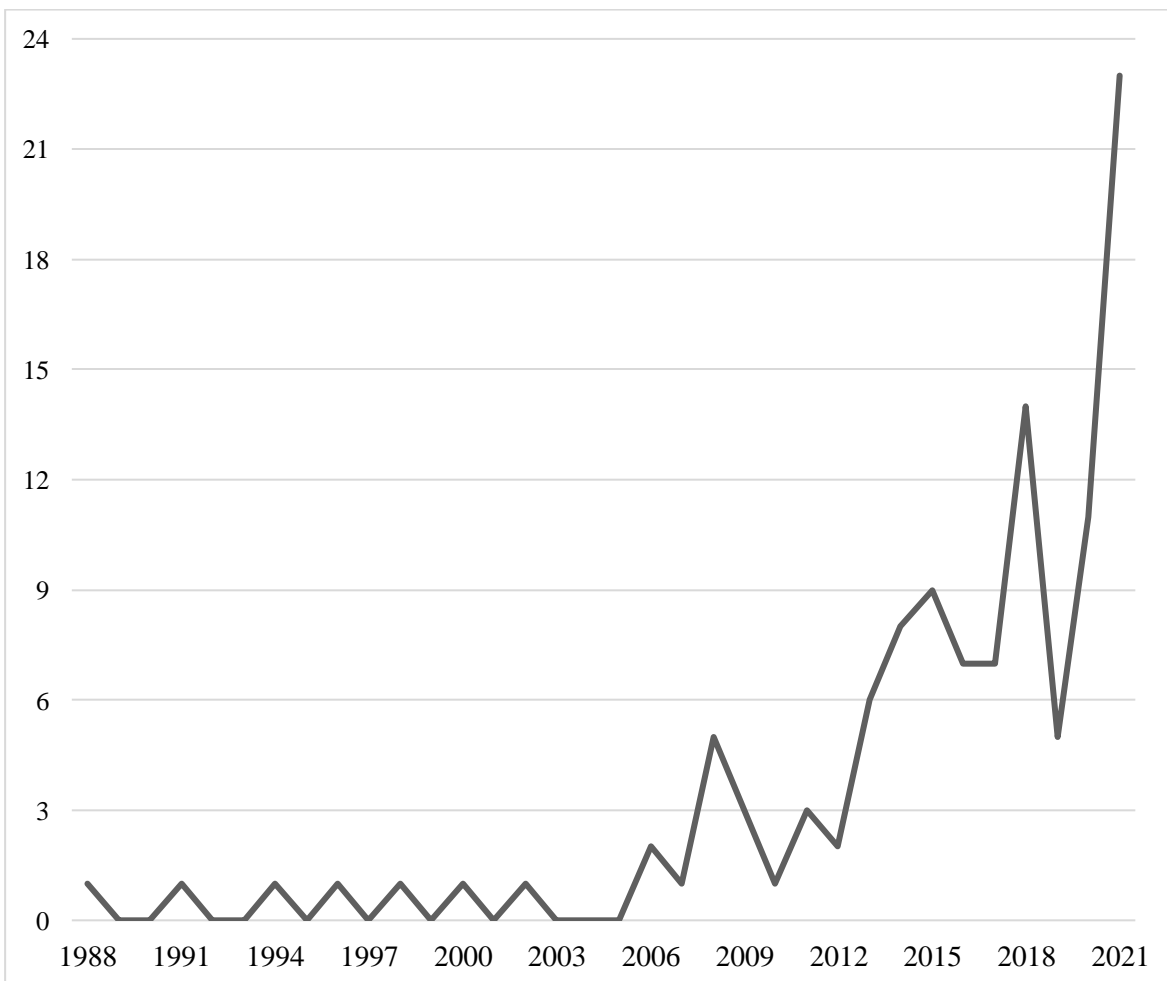
## 1.5. Results

The analysis of the results completes the final two steps in the systematic review process: analyzing/summarizing the studies (fourth step) and communicating/using the results (fifth step). This section is presented in two parts: a descriptive component and an analytical component.

### 1.5.1. Descriptive component

The descriptive analysis presents eight major trends in the literature on the link between the BoD and innovation. Figure 3 illustrates the temporal trends, while Table 9 presents a summary of the trends at the empirical, sectoral, geographic (top 5 countries), dimensional, editorial (top 5 journals), theoretical (top 5 theories), and semantic levels.

**Figure 3.** Publication trends (1988–2021)



**Table 9.** Summary of the major trends

<b>Trends</b>	<b>Key figures</b>
1. <i>Empirical</i>	Quantitative (96,49%); Qualitative (0,88%); Mixed-Method (2,63%).
2. <i>Sectorial</i>	Multisectoral (75, 44%), High-Technology (13, 16%); Manufacturing (11,40%).
3. <i>Geographical</i>	USA (48,25%), China (13,16%), International (9,65%), Taiwan (5,26%); Sweden (5,26%).
4. <i>Dimensional</i>	Large firms (88, 60%); SMEs (11,40%).
5. <i>Editorial</i>	JBR (12, 28%), CGIR (5, 26%), JPIM (5, 26%), BSE (5, 26%); AOM (4, 39%).
6. <i>Theoretical</i>	Agency (39,47%); None (24, 56%), RDT (19, 30%); Behavioural (7, 01%); RBV (5, 79%).
7. <i>Semantical</i>	Inputs (41, 23%); outputs (30, 09%); both (23, 68%).

### 1.5.1.1. Temporal trends

The first article to study the link between the BoD and innovation appeared in 1988, as shown in Figure 3, which means that this systematic literature review covers a period of 33 years (1988–2021) with a total of 114 articles. The curve shows that, overall, this research topic has been the subject of growing interest on the part of the scientific community, particularly in recent years. More than three-quarters of the articles (80,70%) were published in the most recent decade interval (2012–2021), and more than half (52,63%) were published in the last five years (2017–2021). The increase in the number of studies from around 2006 onward may be due to the mixed results produced at that time, which led some researchers (e.g., Aaboen et al., 2006; Balsmeier et al., 2014; Dalziel et al., 2011) to report this fact through publications in leading journals (e.g., *Journal of Management Studies*, *Research Policy*, and *Technovation*) and explicitly call for additional research in this area. We also found that the recent peak of publications (23 articles in 2021) was related to the concept of board diversity. This observation may be due to the particular attention given to the concept of diversity in societies, which has been transposed at the organizational level through issues such as the low representativeness of minorities at the executive level, and to a desire for change regarding boards' compositions so that they no longer represent “old boys' clubs.” Between 2018 and 2021, this resulted in concrete and intensive actions, such as the adoption of



legislation aimed at increasing board diversity by multiple US states, as well as other entities, such as the Nasdaq Stock Market.

### **1.5.1.2. Empirical trends**

Quantitative studies are clearly dominant in the literature on the link between the BoD and innovation. Only one of the 114 articles adopted a purely qualitative approach by using a multiple-case study as a research strategy (Klarner et al., 2020). Another article used FsQCA (Schiehll et al., 2018), which is considered a mix of qualitative and quantitative, while two others favoured a mixed-methods approach by relying on both GLS regression and FsQCA (Rodrigues et al., 2020), as well as OLS regression and interviews (Almor et al., 2019). We also noted that only 19 of 114 articles were based on primary data, with surveys (17/19) and interviews (2/19) being the data collection tools. It is also worth mentioning that very few articles went further than regression (5/114) to choose more sophisticated/original statistical methods, such as FsQCA (2/114) and structural equation modeling (3/114).

### **1.5.1.3. Sectoral trends**

Most of the studies were carried out in a multi-sectoral context (86/114), followed by those that focused specifically on manufacturing (15/114) and high-tech (e.g., Information Technology, Electronics, and Pharmaceuticals) industries (13/114).

### **1.5.1.4. Geographic trends**

The studies included in this systematic review were mainly conducted in the United States (55/114), followed by China (15/114), international samples (11/114), Taiwan (6/114), Sweden (6/114), Korea (3/114), Italy (3/114), India (3/114), Germany (3/114), the United Kingdom (2/114), Spain (2/114), Switzerland (1/114), Norway (1/114), France (1/114), Belgium (1/114), and Canada (1/114).

### **1.5.1.5. Dimensional trends**

The decision to use a sample comprising large corporations (i.e., firms with at least 250 employees) or SMEs (i.e., firms with no more than 250 employees) revealed a particularly significant gap. Only 13 of the 114 studies were carried out in the context of SMEs. It is also

interesting that the average sample size was 934 firms overall, but went down to 202 when considering only studies with primary data.

#### **1.5.1.6. Editorial trends**

About one-third of the final body of studies (37/114) were published in scientific journals listed in the prestigious *Financial Times 50 Ranking*, and nearly half of the studies (49/114) were published in the two highest ABS ranking levels (i.e., categories 4\* and 4), meaning scientific journals of very high calibre. The most represented journals (i.e., at least three articles) were: *Journal of Business Research* (14/114); *Corporate Governance: An International Review* (6/114); *Journal of Product Innovation Management* (6/114); *Business Strategy and the Environment* (6/114); *Academy of Management* (5/114); *Journal of Financial Economics* (5/114); *Strategic Management Journal* (4/114); *Asia Pacific Journal of Management* (4/114), *Journal of Corporate Finance* (4/114); *Research Policy* (3/114); *Review of Quantitative Finance & Accounting* (3/114); *R&D Management* (3/114); *Journal of Empirical Finance* (3/114) and *British Journal of Management* (3/114).

#### **1.5.1.7. Theoretical trends**

A significant proportion of the studies were not explicitly based on any theory (28/114). This observation was particularly recurrent among journals specializing in finance and accounting. Many articles relied on a single theory (40/114), mostly agency theory (17/40), and the latter was the most widely represented theory in general (45/114) followed by resource dependence theory (22/114). The other three most common theories were upper echelon theory (10/114), behavioural theory (8/114), and the resource-based view (6/114).

#### **1.5.1.8. Semantic trends**

Innovation has most often been studied through its inputs (47/114 articles), or more specifically, investments in R&D. It has been represented in a variety of ways. For example, it has been measured by the ratio of R&D expenditure to total sales (Bravo and Reguera-Alvarado, 2017; Choi et al., 2019; Lu et al., 2021), by the ratio of R&D expenditure to total assets (Almor et al., 2019; Bommaraju et al., 2018; Díaz-Díaz et al., 2021), by the ratio of R&D expenditure to total number of employees (Baysinger et al., 1991; Chen, 2014; Deutsch, 2007), and by average R&D expenditure (Dalziel et al., 2011).

Innovation outputs are also widely represented (40/114 articles), mostly through patents and/or citations. Here again, significant heterogeneity can be seen in the consideration of the number of patent applications (Blasmeier et al., 2014; Matzler et al., 2015), the number of patents granted (Balsmeier et al., 2017; Faleye et al., 2018), or both at the same time (Chen et al., 2015).

About a quarter of the articles (27/114) provided an analytical framework enabling the analysis of the impact of the BoD on both innovation inputs and outputs. These articles mainly relied on both R&D expenditure and patents/citations (e.g., Faleye et al., 2011; Leung and Sharma, 2021), but some relied on more original and fine-grained measures, such as innovation indexes (e.g., Zahra, 1996; Zona et al., 2013).

### **1.5.2. Analytical component**

The corporate governance literature tends to ignore the environment in which organizations operate, and this is especially true for studies at the junction of the BoD and innovation (Balsmeier et al., 2014; Boyd et al., 2017; Wu and Wu, 2014). However, the internal environment can play an important role in a board's ability to influence innovation (Lim and McCann, 2014; Wu, 2008; Zona et al., 2013). This statement also applies to the external environment (Chen et al., 2016; Huse, 2000; Zahra and Pearce, 1989), as firms have to deal with various external pressures, whether from the industry, the competition, or broader social and environmental factors (Haxhi and Aguilera, 2017; Schilke, 2018).

Thus, even if we focus primarily on the link between the BoD and innovation, it quickly became apparent that we must integrate environmental factors into our approach. In this regard, the contingency perspective adopted in this study reveals its importance here, by giving us a holistic view, allowing us to be particularly nuanced, and providing us with the tools to conduct a fine-grained analysis.

The analytical component is structured around three main themes: (1) the internal environment, (2) the external environment, and (3) organizational outcomes. The resulting integrative conceptual framework (Figure 4) reveals the main dimensions that have been shown to be significant in explaining variations in innovation inputs and/or outputs.

The general idea is that to explain the potential impact of the BoD on innovation, there are three main phases linked by two connectors, and various contingencies allow this relationship to be put into perspective.

The first phase is to build an optimal board composition by paying particular attention to independence, diversity, and size.

At this point comes the first connector, which translates into giving meaning to board composition by assessing the extent to which it enables to build a pool of directors reporting a high degree of human and social capital.

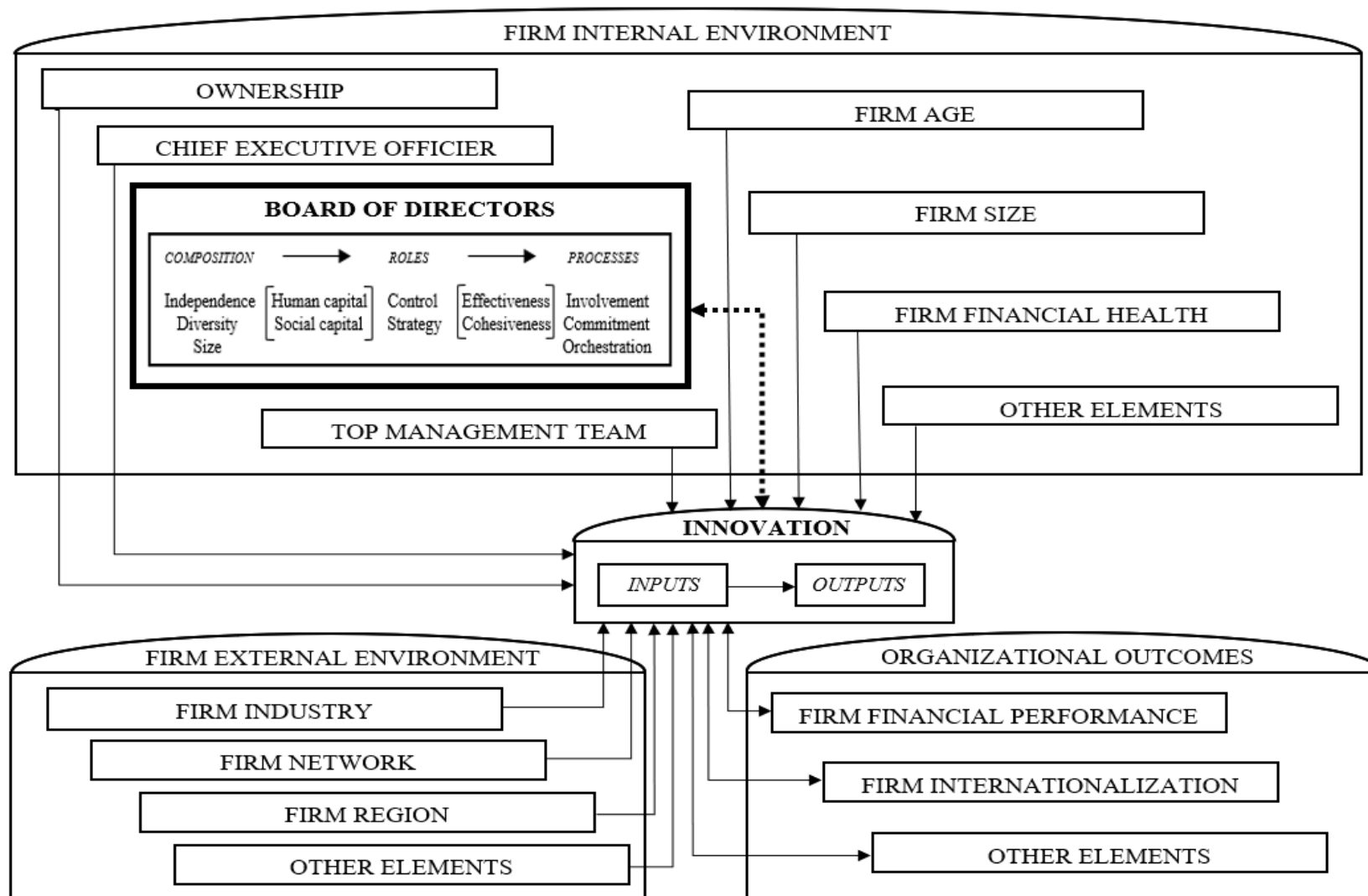
Next, it becomes possible to analyze the degree to which the directors adequately assume their control and strategy roles; this is the second phase.

The second connector then comes into play, which allows to evaluate board efficiency and cohesion.

These last aspects lay the foundations for the third phase, which relates to board processes. This last phase is about looking into the signs of involvement, the demonstration of commitment, and the orchestration of initiatives aimed at stimulating innovation.

Finally, since the BoD is not impermeable to its environment, various relevant contingency factors are considered.

**Figure 4.** Integrative conceptual framework of the link between the BoD and innovation



## **1.5.2.1. Internal environment and innovation**

### **1.5.2.1.1. BoD and innovation**

The BoD is the highest corporate echelon within organizations, which gives it strategic responsibility (Bommaraju et al., 2018; Pearce and Zahra, 1992; Pugliese et al., 2009), particularly in terms of the allocation and access to resources (Barroso-Castro et al., 2022; Hillman et al., 2000; Johnson et al., 1996). In this regard, its composition, roles, and processes must be considered to better grasp the potential contributions of this decision-making body (Forbes and Milliken, 1999; Ravasi and Zattoni, 2006; Tasheva and Hillman, 2019), especially when the goal is to investigate its potential impact on a specific organizational outcome, in this case innovation.

#### **1.5.2.1.1.1. BoD composition and innovation**

*Independence:* Independent directors have no other role or relationship with the firms they serve (Faleye et al., 2011; Pfeffer and Salancik, 2003). This may be the most widely studied concept at the board level, and the literature on the link between the BoD and innovation testifies to this. It also shows that a positive impact is the most recurrent finding for innovation inputs measured by R&D (Chen et al., 2018; Hill and Snell, 1988; Shaikh et al., 2018). However, the opposite has also been established by some authors (e.g., Kang et al., 2018; Yoo and Sung, 2015; Zahra, 1996). It could be that inside directors are more likely than their outsider counterparts to increase R&D (Baysinger et al., 1991; Ge and Kim, 2014; Ghosh, 2016), even though this is not always the case (Dalziel et al., 2011; Paik and Woo, 2017; Srivasan et al., 2018). The literature is also fragmented regarding the link between board independence and innovation outputs (Chen et al., 2016; Srinivasan et al., 2018; Zahra et al., 2000).

A plausible explanation for these mixed results is that independence could stimulate innovation inputs up to a certain threshold, beyond which it would become detrimental (Wincent et al., 2013), and this same logic can be applied to inside directors. However, it remains a rather simplistic justification for such a complex phenomenon. To better understand the influence that board independence can exert on innovation, it seems more relevant to look at the concrete added value associated with it. This can be reflected in the

combinations of the presence of independent directors and other concepts, such as (1) board human capital, (2) board social capital, (3) board demographics, (4) board roles, and (5) contingencies.

Independent directors' human capital has proved to be relevant through its positive impact on innovation, both inputs and outputs, when measured by Ivy League education and technical education (Dalziel et al., 2011), academy fellowship (Li et al., 2021), innovation experience before appointment (Balsmeier et al., 2014; Nguyen et al., 2020), and previous CEO experience within the same industry (Kang et al., 2018). However, human capital does not guarantee superior innovation inputs, as shown by studies of directors' entrepreneurial experience (Dalziel et al., 2011), as well as the interactions of outside directors with top managers' shared team-specific management experience, functional background heterogeneity, and tenure (Kor, 2006), which have a negative impact on R&D. Human capital is also not necessarily a catalyst for innovation outputs, as outside directors' marketing and sales experience (Vandenbroucke et al., 2016) can cause organizations to patent less.

Board social capital has also been identified as a relevant component in explaining the impact of board independence on innovation inputs. The network size of non-executive directors (Helmets et al., 2017) or busy boards (Faleye et al., 2011) may have a positive impact on R&D, whereas its interaction with early CEO tenure (Zona, 2016) can reduce innovation inputs. Outside directors' interlocks with low-tech firms (Dalziel et al., 2011) and the interaction between outside directors and discrepancies (Yoo and Sung, 2015) can foster innovation inputs. Also, non-executive-created interlocks represent vectors of innovation outputs (Li, 2021).

Board demographics is another interacting component that could guide the link between the board independence and innovation. For example, the interaction between outside directors and the proportion of female directors (Benkraiem et al., 2021) has been found to decrease innovation inputs. Conversely, the interaction between inside directors and financial slack (Shaikh et al., 2018) can generate higher innovation inputs.

Certain interactions between the independence of directors and other variables were interesting in explaining variations in innovation. Zona et al. (2013) found that outside

directors were positively associated with innovation when moderated by firm size. Chen et al. (2016) revealed that the interaction between BoD independence and firm technology diversity strategy positively affected innovation outputs, but the opposite was true when the interaction was with firm observative capacity. Vandenbroucke et al. (2016) concluded that outside directors' diversity had a negative impact on innovation outputs but that the impact was positive for outside directors' tenure.

Guldiken and Darendeli (2016) suggested that the interaction between board monitoring and outside directors' tenure positively affects innovation inputs, but when monitoring is intensive, the sign becomes negative. On their part, Faleye et al. (2011) found that monitoring-intensive boards (i.e., when a majority of independent directors serve on at least two of the three principal board committees), have a negative impact on R&D and patents.

Overall, these facts leave little doubt that independence in itself is insufficient to explain variations in terms of innovation inputs and/or outputs. However, through the five elements presented in the preceding lines (i.e., board human capital, board social capital, board demographics, board roles, and contingencies), it takes on meaning and importance.

*Size:* The analysis of the variable "board size" revealed two main trends. The first is that smaller size leads firms to spend more on R&D (Dalziel et al., 2011; Faleye et al., 2018; Ghosh, 2016), but the opposite sign has also been observed (Balsmeier et al., 2017; Cai and Nguyen, 2018). The second is that larger size generates growth in innovation outputs (Chen et al., 2015; Kang et al., 2018; Torchia et al., 2011), but once again, we noticed that this result was not consistent (Chang and Wu, 2021; He and Jiang, 2019).

In this sense, as in the case of board independence, it appears that board size would in itself be of little relevance in explaining variations in innovation inputs and outputs. However, potential explanations are subtler and therefore more difficult to detect because board size is often used only for control purposes, so it has rarely been combined with other variables. Some exceptions are the papers written by Coles et al. (2008), which underlined the need to analyze the level of complexity of organizations; Dalziel et al. (2011), which showed that an increase in board size with regard exclusively to the proportion of outside directors would



lead to an increase in R&D spending; and Zona et al. (2013), which concluded that the interaction between board size and firm size enhances innovation.

That being said, it seems rational to argue that the five dimensions mentioned for board independence are also relevant for board size. Thus, when the objective is to analyze the impact of board size on innovation, we underline the pertinence of considering interaction effects, especially between this variable and the following five concepts: (1) board human capital, (2) board social capital, (3) board demographics, (4) board roles, and (5) contingencies.

*Diversity:* Board diversity can be split into two main categories: surface-level diversity and deep-level diversity. The first refers to demographic variables, the most recurrent being directors' gender, ethnicity/race, nationality, and age. The results are rather mixed for board gender diversity, as both its positive (Attah-Boakye et al., 2020; Chen et al., 2018; Miller and Triana, 2009) and negative (Almor et al., 2019) impacts on innovation inputs have been supported. The same is true for innovation outputs, as both positive (Horbach and Jacob, 2018; Nadeem et al., 2020; Orazalin and Mahmood, 2021) and negative effects (García-Sánchez et al., 2021; Li, 2019) have been revealed. Board racial diversity fosters innovation inputs (Miller and Triana, 2009), and foreign directors have been found to exert a positive impact on innovation outputs (Usman et al., 2020). Age diversity can be a barrier to innovation outputs (Li and He, 2021). Other aspects related to directors' age but not diversity have been investigated. For example, board average age has been found to positively influence innovation inputs represented by R&D (Chen et al., 2018) and outputs measured by patents/citations (Faleye et al., 2018), but the negative link has also been supported once again for both innovation inputs (Bravo and Reguera-Alvarado, 2017) and outputs (Cao et al., 2021). The number of directors aged 60+ was also found to have a negative impact on innovation outputs, as measured by patents (He and Jiang, 2019).

The results of some studies provide plausible explanations for better understanding how board surface-level diversity can influence innovation. Cumming and Leung (2021) found that board gender diversity is more pertinent in facilitating innovation in male-dominated industries. Almor et al. (2019) suggested that gender diverse boards encourage ambidexterity and indirectly encourage innovation. Li and He (2021) stipulated that surface-level diversity

is the main reason cognitive diversity and other more specific variables, such as directors' educational background and expertise, are positively associated with innovation. Miller and Triana (2009) similarly found that gender and ethnicity were particularly beneficial for innovation due to their contribution in terms of human and social capital, and Attah-Boakye et al. (2020) underlined that national norms, cultural values, and country-level institutional quality can have a significant influence on gender diversity.

There is clearly a greater consensus regarding the impact of deep-level diversity on innovation, but we must note that this type of diversity has been much less studied to date than surface-level diversity. The literature suggests that BoD educational and functional diversity both have a positive impact on both innovation inputs and outputs (Li et al., 2021; Li and He, 2021; Wincent et al., 2010). An exception is the study by Vanderbroucke et al. (2016), which found that deep-level diversity was negatively associated with innovation outputs, as measured by patents. There are three possible explanations for this result. The first is that these authors relied on a specific measure of functional diversity that was previously used in the context of TMT rather than BoD. Second, their sample was quite specific, considering only early-stage hi-tech firms. Third, this study considered outside directors' diversity and thus omitted that of inside directors. A second exception is the study by Wincent et al. (2009), which concluded that board functional diversity was negatively associated with innovation performance. However, once again, there are some specificities that could explain this finding, such as the fact that this research was conducted in the context of SMEs, used board networks as the main unit of analysis, and measured network innovation performance instead of the individual innovation performance of firms as a dependent variable.

Other authors have relied on board diversity indexes and revealed its positive impact on innovation by considering multiple types of diversity simultaneously, sometimes exclusively different types of deep-level diversity (An et al., 2021; Zona, 2012), and at other times, various types of both deep-level and surface-level types (Bernile et al., 2018; Zona et al., 2013). Although rare, some studies have associated deep-level diversity with more specific characteristics to better understand its impact on innovation. For example, Wincent et al. (2010) revealed that the interaction of board expertise diversity with board meeting frequency

decreased total, radical, and incremental innovation. In contrast, Zona et al. (2013) found that the interaction between board diversity score accounting for both surface-level and deep-level diversity and firm size had a positive impact on innovation, as measured by an index. Finally, it is relevant to point out that diverse boards could benefit from superior advising capacity (An et al., 2021; Wincent et al., 2010) and in this sense be more involved and effective in their strategic role.

These elements lead to many relevant observations. First, deep-level board diversity has produced more consistent results than surface-level board diversity, but it has also been less investigated. Second, it is important to go beyond the symbolic character of surface-level diversity by associating it with deep-level diversity or other aspects related to directors' human and social capital, as well as contingencies. Finally, both directors' surface-level and deep-level diversity should be analyzed by investigating the extent to which they help the board assume its monitoring and strategic roles.

*Human capital:* Directors' human capital, which refers to their knowledge and skills in particular, can enable them to fulfill their roles (Haynes and Hillman, 2010; Hillman and Dalziel, 2003). In light of our analysis, it was revealed that board human capital can be divided into three main parts: (1) experience/tenure, (2) skills/knowledge, and (3) industry-specific expertise.

Directors' experience/tenure has mainly been negatively linked to both innovation inputs and outputs (Harjoto et al., 2018; Li, 2019; Shaikh et al., 2018; Vandenbroucke et al., 2016). Guldiken and Darendeli's (2016) more in-depth analysis showed that its interaction with board monitoring could govern the causal effect for innovation inputs, while Jia (2017) found that a decrease in the percentage of long-tenured directors fosters innovation outputs, and that an increase leads to the opposite result.

Board knowledge/skills could help turn entrepreneurial orientation into ambidextrous innovation (Arzubiaga et al., 2018). In this continuity, directors with an entrepreneurial background have been positively associated with innovation inputs (Faleye et al., 2020) and outputs (An et al., 2021). A negative link was also found with inputs (Dalziel et al., 2011), but this study did not use a common R&D measure, which could explain this contradictory

result. Board members' innovation experience is another vector of both innovation inputs and outputs (Balsmeier et al., 2014; Nguyen et al., 2020). The experience of outside directors in sales and marketing was identified as a hindrance for patents by Vandenbroucke et al. (2016), but Srinivasan et al. (2018) found a positive relationship between the ratio of directors who were marketing executives and new product introductions. Directors' educational level can also be a vector of innovation inputs (Chen, 2014) and outputs (Wincent et al., 2013), and PhD holders on the board can foster innovation outputs (An et al., 2021). Finally, directors' industry-specific expertise systematically exerts a positive influence on both innovation inputs and outputs (Chen, 2014; Kang et al., 2018; Wu, 2008).

*Social capital:* Social, or relational, capital (Hillman and Dalziel, 2003) refers to board connections within and outside the firm or industry from which organizations can benefit (Haynes and Hillman, 2010). Network size is mostly beneficial for innovation inputs and outputs (Helmers et al., 2017; Wang et al., 2020; Wincent et al., 2013). The same applies to board network centrality (Chuluun et al., 2017; Iyer et al., 2020; Srinivasan et al., 2018). Friendly boards have a positive impact on innovation outputs (Chang and Wu, 2021; Kang et al., 2018), and a similar conclusion was made for busy boards (Chang and Wu, 2021; Kang et al., 2011). The study of co-opted directors has led to mixed results (Cai and Nguyen, 2018; Kang et al., 2018; Nguyen et al., 2020).

To better understand these findings, it is worth noting that the relationship between directors' networks and innovation may be curvilinear (Bravo and Reguera-Alvarado, 2017). Furthermore, the interactions between board social capital and other variables provide us with a more substantial understanding of its relevance. For example, the interaction between board social capital and CEO tenure, as well as between board social capital and CEO education level, can help increase innovation inputs (Chen et al., 2013; Chen and Hsu, 2009). The combined effects of board internal social capital and family involvement, as well as that of board external social capital and family involvement, can enhance patenting (Bendig et al., 2020). Conversely, network size combined with board diversity and board education tends to decrease innovation outputs (Wincent et al., 2010).

Our analysis shows that board human and social capital are more relevant than independence, size, and diversity when it comes to innovation. In fact, it makes it possible to give meaning

to these concepts. Another aspect that emerges is that directors' human and social capital can act as a bridge in the path that goes from the descriptive character of board composition to the concrete actions that translate into directors assuming their roles. Finally, it is necessary to make sure that these concepts are carriers of added value, for example, by supporting directors in their duties, but that it is important not falling into excess, as too much of different expertise and relationships could become complex to manage.

#### **1.5.2.1.1.2. BoD roles and innovation**

*Control role:* Board roles have received much less attention in the literature than board composition. This is true for board research in general, but it is even more apparent for studies located at the junction of the BoD and innovation. The few articles on the subject have concluded counterintuitively that the traditional role of monitoring/control could benefit R&D investments, but only up to a certain point, after which it becomes detrimental (Guldiken and Darendeli, 2016). The same results stand for the interaction between board monitoring and board tenure (Guldiken and Darendeli, 2016). Moreover, board risk oversight can contribute to product innovation (Wu and Wu, 2014), while board vigilance, which reflects the power interplay between CEOs and outside directors in affecting risk preferences, can increase R&D (Lim, 2015). Board members who have dismissed a CEO in the past have a negative influence on R&D expenditure (Cai and Nguyen, 2018), and intensive monitoring by the board can attenuate both R&D investments and patenting (Faleye et al., 2011).

Overall, the findings suggest that board control role can be beneficial for innovation, but firms should be cautious in ensuring that it does not become “too much of a good thing”, as Guldiken and Darendeli (2016) emphasized. This suggests that the control role could allow the BoD to make a more cautious and optimal selection of innovation projects, but that when it becomes too intensive, it could induce risk aversion, which can transform this role into a barrier rather than a catalyst of innovation.

*Strategic role:* It should be noted here that board strategic role holds greater potential in terms of competitive advantage than the control role (Faleye et al., 2011). This is even more true when it comes to innovation (Torchia et al., 2011). These elements suggest that it could be beneficial in all circumstances for innovation. Unsurprisingly, the literature suggests that this

role has a positive impact on innovation, as represented by organizational innovation outputs (Torchia et al., 2011) and helps convert entrepreneurial orientation into ambidextrous innovation (Arzubiaga et al., 2018).

In summary, our analysis indicates that few studies have investigated the impact of board roles on innovation. Counterintuitively, BoD' control role can be a vector of innovation, but only when it is represented sparingly. BoD' strategic role can be represented without moderation as it consistently helps to enhance innovation.

It is also relevant here to go beyond the literature dealing specifically with the link between the BoD and innovation to examine board effectiveness, or what some authors call "board task performance." This aspect is the board-level variable that most directly influences firm performance (Forbes and Milliken, 1999; Minichilli et al., 2009; Zattoni et al., 2015). It can allow board roles to materialize by translating their impact into practice and could ultimately explain how directors can have a concrete influence on organizational outcomes such as innovation.

#### **1.5.2.1.1.3. BoD processes and innovation**

*Processes:* Scholars have increasingly expressed the need to study board processes for more than 30 years, as this may help explain the inconsistent results of research on directors (Forbes and Milliken, 1999; Pettigrew, 1992; Zattoni et al., 2015). These authors have identified three main processes: (1) effort norms (i.e., the motivation and intensity with which board members carry out their duties); (2) cognitive conflict (i.e., clashes between different perspectives within the board regarding task-oriented issues); and (3) the use of knowledge and skills (i.e., the contribution of board members' knowledge and skills in the performance of their duties).

Regarding board effort norms, intensive board involvement (i.e., the extent to which the board's decisions dominate a firm's decision making) was found to be negatively associated with innovation outputs represented by new product introductions, and when board involvement interacts with market instability (i.e., the change rate of environmental factors relevant to strategic decision making), the conclusion is the same (Wu, 2008). However, board commitment (i.e., the extent to which board directors commit themselves sufficiently

to foster effective decisions and reverse failed policies) was found to positively influence product innovation (Wu, 2008). Klärner et al. (2020) recently underscored the importance of boards' involvement in knowledge transfer, particularly with regard to scientific directors, for the purposes of innovation.

Family involvement in the BoD has a negative influence on outputs measured by patents, but the link becomes positive when including interaction effects, specifically through internal and external board social capital (Bendig et al., 2020). The length of board meetings can also diminish the likelihood of introducing organizational innovation (Torchia et al., 2011), whereas the number of board meetings after the CEO's recruitment can lead to more patents and citations (Kang et al., 2018), and the frequency of meetings in general can facilitate the penetration of new markets (Diestre et al., 2015). The intensity of BoD activity has been identified as a negative factor in transforming entrepreneurial orientation in ambidextrous innovation (Arzubiaga et al., 2018), which suggests that the quality of the time spent by directors to fulfill their duties is more important than its quantity.

In the literature at the junction of the BoD and innovation, only effort norms have been investigated to date, so we lack studies that focus on cognitive conflict and the use of knowledge/skills. We also observed that board roles, especially through their outputs in terms of effectiveness and cohesiveness, are fundamental for capturing how board processes can foster or hinder innovation.

#### **1.5.2.1.1.4. Other aspects related to BoD composition**

The other major elements related to the BoD are mainly composition-based variables. Querbach et al. (2020) showed that the retention of a predecessor on the board has a negative impact on product innovation. Kim et al. (2014) found that board turnover tends to reduce exploratory outputs. Torchia et al. (2011) revealed that board chairperson gender is negatively associated with organizational innovation. Having a venture capital director can benefit both innovation inputs and outputs (Celikyurt et al., 2014; Faleye et al., 2020), and the same holds for the presence of the founder of the organization on the BoD (Faleye et al., 2020). Employee representation on the board has been identified as a vector of innovation (Balsmeier et al., 2014; Overland and Samani, 2021). Finally, the family component is also

an important dimension in explaining BoD' impact on innovation, as shown by the mixed results produced with regard to family involvement (Arzibiaga et al., 2018; Bendig et al., 2020; Liang et al., 2013; Matzler et al., 2015), or the positive impact of having a family chair on inputs (Ashwin et al., 2015; Jiang et al., 2020) and negative effects on outputs (Ashwin et al., 2015).

#### **1.5.2.1.1.5. Inverted causal relations (Innovation-BoD)**

The reverse causal link, that is, going from innovation to the BoD rather than the opposite, is often only mentioned to consider potential endogeneity problems. However, it seems that being innovative may indeed have repercussions for a firm's BoD. For example, organizations with high R&D intensity generally have fewer inside directors (Coles et al., 2008), more industry experts (Faleye et al., 2018), and a higher number of academic directors (Francis et al., 2015). A recent study that was not included in our systematic review because it did not meet the inclusion criteria turns out to be relevant here, as it is one of the rare papers analyzing this reverse causal relationship. In this research, the authors corroborated the pertinence of investigating the link going from innovation to the BoD by concluding that specific innovation strategies can require particular directors' profiles (Zenou et al., 2020).

#### **1.5.2.1.2. Shareholders and innovation**

Shareholders represent the highest echelon of governance in general, and their importance is reflected in the fact that no firm exists without owners and the property rights allocated to them (Aguilera and Crespi-Cladera, 2016). Moreover, its strategic relevance has been empirically established (Foss et al., 2021), which makes it even more relevant for our study. The results regarding this concept can be split into seven categories: (1) institutional ownership, (2) ownership concentration, (3) venture capital ownership/investments, (4) family ownership, (5) state ownership, (6) foreign ownership, and (7) other types of ownership.

Institutional ownership can stimulate or hinder both innovation inputs and outputs (Canil et al., 2021; Chen et al., 2013; Kor, 2006; Nguyen et al., 2020). Ownership concentration has yielded mixed results, but only for innovation inputs (Baysinger et al., 1991; Li et al., 2021; Zhang et al., 2014). The results are also mixed regarding venture capital ownership, this time



both for innovation inputs and outputs (Celikyurt et al., 2014; Diestre et al., 2015; Paik and Woo, 2017). The analysis of state ownership has also led to inconsistent results, but only for innovation outputs (Chen et al., 2015; Li et al., 2021; Usman et al., 2020). Family ownership has been positively associated with innovation outputs (Chen et al., 2016; Wu and Wu, 2014). Finally, we observed that founder ownership (Paik and Woo, 2017) and ownership education (Li et al., 2021) exert a positive influence on innovation inputs.

A recent meta-analysis on corporate ownership concluded that it is a complex and rich subject that has yielded mixed results (Boyd and Solarino, 2016). Overall, our analysis of the literature at the junction of the BoD and innovation corroborates these observations and reveals that ownership is an important factor to consider. An in-depth analysis of this concept made it possible to extract three main findings. First, the heterogeneity of the concept of ownership implies that the sign of its impact on innovation could differ greatly depending on the specific type of ownership. Attesting to this fact, Nguyen et al. (2020) found that institutional ownership has a positive impact on innovation inputs, as measured by the ratio of R&D to assets, but Paik and Woo (2017) revealed that venture capital ownership has a negative influence on this same innovation measure.

Second, this same logic can be applied to the concept of innovation, as the influence of ownership might not be the same, depending on the specific type of innovation. Hoskisson et al. (2002) provided an enlightening demonstration of this reality by concluding that ownership in terms of professional management investment funds has a negative influence on internal innovation but a positive influence on external innovation.

Third, Zahra (1996) found that long-term institutional investor ownership was positively associated with innovation but that the sign was negative for short-term institutional investor ownership, which suggests that beyond the specific type of ownership and/or innovation, other specificities, such as the temporal perspective in which ownership takes place, could also dictate the sign of its impact on innovation.

#### **1.5.2.1.3. Top management teams and innovation**

Top management teams (TMT) have, in particular, been studied from the perspective of upper echelons (Hambrick and Mason, 1984; Narayan et al., 2021). The influence of this

decision-making body at the strategic level has been widely documented in terms of innovation (Bantel and Jackson, 1989; Qian et al., 2013; Talke et al., 2010). The literature on the link between the BoD and innovation shows that many variables related to TMT might cause it to fluctuate. Having marketing personnel (Bommaraju et al., 2019), shared team-specific management experience, extensive tenure (Kor, 2006), and outsidership (Choi et al., 2019) can help enhance innovation inputs represented by R&D. TMT ownership (Shaikh et al., 2018), low tenure (Kor, 2006), and family management (Matzler et al., 2015) can hamper innovation inputs.

With respect to innovation outputs, factors that have a positive impact include tenure (Vandenbroucke et al., 2016), family management (Matzler et al., 2015), extensive managerial ownership (Wu, 2008; Zahra, 1996; Zahra et al., 2000), the weighted average of TMT members' education degrees (Chen et al., 2016), and the proportion of female executives among the five highest paid members of the TMT (Canil et al., 2021). Conversely, the share of women in the TMT can exert a negative effect on innovation outputs, as measured both by product/process innovation and eco-innovation (Horbach and Jacob, 2018).

These findings suggest that the study of a single corporate governance body such as TMT is insufficient for explaining the influence of corporate governance on organizational outcomes (Certo et al., 2006). By the same logic, it highlights the fact that when studying the impact of the BoD on innovation, the TMT should not be ignored. One of the best testimonies lies in the findings of Chen (2015), which revealed interesting interaction effects, such as the ones between TMT attention to innovation and board size (positive impact on innovation inputs) and between the same TMT variable and BoD independence (negative impact on innovation outputs).

#### **1.5.2.1.4. Chief executive officer and innovation**

Entrepreneurs are often the focus of study when it comes to innovation (Schumpeter, 1934), and this has carried over into the literature on corporate governance with the emergence of a field of research dedicated to the analysis of the CEO's potential impact on innovation (Chen, 2020; Sariol and Abebe, 2017). The elements related to the CEO can be separated into six

main categories: (1) the pecuniary aspect, (2) demographic characteristics, (3) tenure, (4) duality, (5) human capital, and (6) others.

Regarding the pecuniary aspect, in general, the results showed that CEO shareholding and bonuses all represent potential vectors of innovation (Deutsch, 2007; Lim, 2015; Zona, 2016; Zona and Zamarian, 2021). For demographic characteristics, there is a certain consensus around the positive impact of CEO age and its negative impact on innovation inputs (Almor et al., 2019; Cai and Nguyen, 2018; Zona, 2012) and outputs (Cook and Glass, 2015; He and Hsu, 2009; Torchia et al., 2011). CEO tenure has yielded mixed results (Bommaraju et al., 2019; Canil et al., 2021; Zona et al., 2016), while human capital, which has mainly been studied through CEO education, has been found to exert a positive influence on both innovation inputs and outputs (Chen et al., 2013; Chen and Hsu, 2009; Kang et al., 2018). The results concerning CEO duality are also mixed, but the thesis of a positive impact has been the most widely supported empirically (Chen, 2015; Li et al., 2021; Lim, 2015). Finally, other aspects related to the CEO that have proven to be relevant for innovation inputs and outputs are CEO turnover with a negative impact (Kim et al., 2014; Shaikh et al., 2018), the presence of a family CEO with a positive influence, and the analysis of the chief technology officer instead of the CEO with a positive impact of its tenure and education on innovation outputs (Wu et al., 2021).

#### **1.5.2.1.5. Firm size and innovation**

Firm size has been found to have a mostly positive impact on innovation inputs (Almor et al., 2019; Baysinger et al., 1991; Sena et al., 2018), but the opposite has also been described (Cai and Nguyen, 2018; Celikyurt et al., 2014; Li et al., 2021). Regarding innovation outputs, the results are also mixed, as both positive (Chuluun et al., 2017; Hoskisson et al., 2002; Li et al., 2021) and negative (Canil et al., 2021; He and Jiang, 2019; Matzler et al., 2015) links have been empirically supported. Overall, the thesis of the positive impact is the most plausible given past research, both for innovation inputs and outputs.

These observations support the main findings of meta-analyses that have specifically investigated the impact of organizational size on innovation, namely, that a larger size is preferable for stimulating innovation (Camisón-Zornoza et al., 2004; Damanpour, 1992). The

sometimes-mixed results could potentially be due to the different ways in which both firm size and innovation are measured, and the different realities faced by large and small firms. Jugend et al. (2018) suggested that it is difficult to take a categorical stance on what constitutes an optimal organizational size for innovation. However, there is no doubt that firm size is one of the most important contingencies, so it should be integrated into the analysis when studying the impact of the BoD on innovation. The best testimonies of this fact are found in the study by Zona et al. (2013), which showed that the interaction between firm size and various board variables (i.e., board diversity, board size, and outside directors) have a significant influence on innovation.

#### **1.5.2.1.6. Firm age and innovation**

In the literature analyzing the impact of the BoD on innovation, firm age is another crucial component that has proven to be relevant. The positive (Balsmeier et al., 2017; Dalziel et al., 2011; Han et al., 2015) and negative (Cheng, 2008; Paik and Woo, 2017; Zona, 2016) impacts have both been supported. The same is true for innovation outputs, as both the positive (Balsmeier et al., 2017; Li and He, 2021; Wu et al., 2021) and negative (Leung and Sharma, 2021; Liang et al., 2013) influences of firm age have been supported.

The effects of firm age on innovation could partly depend on various factors, such as the distinction between innovation inputs and outputs. Also, “younger” firms usually engage in higher-risk, randomly distributed innovation projects, whereas the innovation efforts of “older” firms are more predictable (Coad et al., 2016). This different propensity for risk based on firm age is another potentially plausible explanation for the mixed results discussed above. Finally, these contradictory results could also be because the effect of firm age differs based on the firm’s industry segment (Huergo and Jaumandreu, 2004). Overall, what must be emphasized is that the age of organizations is certainly a contingency of great importance when it comes to linking the BoD to innovation.

#### **1.5.2.1.7. Firm financial health and innovation**

Financial slack has been found to be mostly beneficial for innovation inputs (Choi et al., 2019; Shaikh et al., 2018; Zona and Zamarian, 2021) and outputs (Ashwin et al., 2015; Wu, 2008), with one exception for innovation inputs (Paik and Woo, 2017) and another for

outputs (Faleye et al., 2018). Capital expenditure has led to more mixed results. Previous research has highlighted its positive (Ghosh, 2016; Jiang et al., 2020) and negative influence (Chuluun et al., 2017; Faleye et al., 2018), and the same holds for innovation outputs, as both positive (Balsmeier et al., 2017; Chang and Wu, 2021) and negative effects have also been supported (Faleye et al., 2018; Nadeem et al., 2020). Liquidity/cash has also yielded mixed results (Chuluun et al., 2017; Díaz-Díaz et al., 2021; Han et al., 2015; Miller and Triana, 2009). Beyond financial resources, firm debt has drawn a certain degree of consensus regarding its negative impact on innovation inputs and outputs (Ashwin et al., 2015; Balsmeier et al., 2017; Chuluun et al., 2017; Faleye et al., 2011; Yoo and Sung, 2015).

These conclusions support the fact that both financial resources and debt, which give an idea of the financial health of the company, could play a crucial role in innovation (Choi et al., 2016; Weiss et al., 2011).

#### **1.5.2.1.8. Other relevant internal environment elements and innovation**

Many other concepts have proven to be relevant for both innovation inputs and outputs. The main ones are firm diversification (Bommaraju et al., 2019; Li, 2019; Upadhyay and Öztekin, 2021); property, plant, and equipment (Chang and Wu, 2021; Chen et al., 2018; Nguyen et al., 2020); absorptive capacity (Chen et al., 2016; Lu et al., 2021); and market-to-book ratio (Lim, 2015; Wu et al., 2021).

Other vectors of innovation found within the internal environment include firms' diversity (Li, 2019), technological diversification strategy (Chen et al., 2016), and absorption capacity (Chen et al., 2016), which have a positive impact on patents. In addition, technological opportunities have a positive impact on the intensity of R&D expenditure (Zona, 2016), as well as on product, process, and organizational innovation (Zahra et al., 2000), and publicly traded firms innovate more than those that are not publicly traded (Zona et al., 2013). Marketing intensity leads to the introduction of more new products (Srinivasan et al., 2018), and entrepreneurial orientation has a negative influence on ambidextrous innovation (Arzubiaga et al., 2018). A firm's independence (Vandenbroucke et al., 2016) and stock yield (Kang et al., 2018) have a negative effect on patents. Increasing the number of strategic business segments decreases the intensity of R&D expenditure (Chen et al., 2016), and sales

diversity has a negative impact on R&D expenditure intensity (Shaikh et al., 2018). Finally, having an older workforce hinders product and process innovation (Horbach and Jacob, 2017).

## **1.5.2.2. External environment and innovation**

### **1.5.2.2.1. Firm industry and innovation**

Industry is the element that has received the most attention in terms of external environment in the literature on the link between the BoD and innovation. Technology industries stand out with their positive impact on innovation in terms of both inputs (Bravo and Reguera-Alvarado, 2017; Iyer et al., 2020) and outputs (Kang et al., 2018; Wu, 2008; Wu and Wu, 2014). Other industries, such as consumer non-durable goods (Zahra, 1996) and medicinal and botanical products (Dalziel et al., 2011), have distinguished themselves for their negative effects on innovation. Other considerations are also relevant when it comes to industry, such as average industry R&D expenditure, which has a positive influence on innovation inputs (Baysinger et al., 1991) and outputs (Hoskinsson et al., 2002). Industrial diversity is another vector of innovation (Li, 2019). Industrial concentration is a hindrance to both R&D expenditure intensity (Chuluun et al., 2017; Zona, 2016) and patents and citations (Kang et al., 2018). Overall, these findings support the contention of some authors (e.g., Pellegrino and Savona, 2017) that industry appears to be as significant as financial constraints to explain innovation.

### **1.5.2.2.2. Firm network and innovation**

A firm's network has benefits in terms of both innovation inputs and outputs (Srinivasan et al., 2018; Wincent et al., 2013). The network, and more specifically the idea of collaboration it suggests, is perhaps more tangible in concepts such as open innovation, but the elements presented here show that its scope is far from limited to this area. Moreover, a link can be established with the social capital of directors discussed earlier, which seems also relevant at the firm level. This supports the close link between the BoD and its external environment, and the potential impact of these two elements on innovation, as well as that of their interactions.

#### **1.5.2.2.3. Firm region and innovation**

Geographical context is also relevant for innovation. This concept refers to several elements such as cultural dimensions (Attah-Boakye et al., 2020), political uncertainty (Díaz-Díaz et al., 2021) or, more largely, the institutional environment (Li et al., 2021; Rodrigues et al., 2020). It can also be measured by distinguishing some models, for example, those of similar countries (Sena et al., 2018), or even some regions within the same country (Wu and Wu, 2014). Overall, it appears that geography may not only have a direct impact on innovation, but also moderate or mediate the influence of other variables (Feldman, 1993; Von Zedtwitz et al., 2015).

#### **1.5.2.2.4. Other relevant external environment elements and innovation**

The other main external factors in the literature investigating the impact of the BoD on innovation are alliances/networks (Diestre et al., 2015; Sena et al., 2018), mergers and acquisitions (Li, 2019; Lim and McCann, 2014), and competition (Querbach et al., 2020; Wu et al., 2021). Environmental dynamism can also be beneficial to technological exploration, expressed in terms of patents (Li, 2019), while environmental uncertainty can decrease the intensity of R&D expenditure (Lim, 2015). Another interesting aspect to consider is that innovation can vary greatly from year to year (Chen et al., 2015; Chen et al., 2016; Wincent et al., 2013). Globally, these findings suggest that the external environment of firms is certainly relevant for innovation, especially when it allows organizations to tap into new knowledge (Crescenzi and Gagliardi, 2018; Ko et al., 2021).

#### **1.5.2.3. Organizational outcomes and innovation**

This study focuses specifically on the link between the BoD and innovation by carefully distinguishing inputs from outputs. However, adopting a contingency approach has made it possible to identify the interactions between various elements related to organizations' internal and external environments. Ultimately, we were also able to identify various organizational outcomes, such as financial performance and internationalization, that are relevant for explaining variations in innovation.

### **1.5.2.3.1. Innovation inputs and outputs**

Some studies on the relationship between the BoD and innovation have analyzed the impact of directors on inputs and outputs simultaneously. With regard to the most recurrent innovation input, R&D expenditure intensity, these studies have shown its positive impact on patents and citations (Balsmeier et al., 2017; Celikyurt et al., 2014; Sena et al., 2018), as well as the introduction of new products (Mazzola et al., 2016; Srinivasan et al., 2018; Wu and Wu, 2014). These findings suggest that the more active firms are in terms of innovation inputs, as measured by R&D investments, the more likely they are to generate innovation outputs, represented by patents, citations, and product innovation. It also shows that it is important for the BoD to be active in its role of resource allocation, particularly regarding the R&D budget, because this represents the safest path to generating innovation outputs.

### **1.5.2.3.2. Innovation and financial performance**

R&D expenditure intensity has also been shown to serve as a catalyst for financial performance, as represented by firm value (Kang et al., 2018), return on assets (Chen et al., 2016; Hill and Snell, 1988; Francis et al., 2015), profitability (Bernile et al., 2018), Tobin's Q (Chen et al., 2016; Cole et al., 2008; Jia, 2017), return on equity (Zhang et al., 2014), or a combination of the latter two financial indicators (Miller and Triana, 2009). However, although this appears to be an isolated finding, both Celikyurt et al. (2014) and Cao et al. (2021) found that R&D expenditure intensity had a negative impact on return on assets and return on sales. This finding shows that money put into R&D should be considered a strategic investment rather than being reduced to the concept of expenditure. Less surprisingly, innovation outputs have also been identified as vectors of financial performance. For example, an increase in patents and citations generates a higher Tobin's Q (Cai and Nguyen, 2018; Jia, 2017) and superior return on assets (Jia, 2017). Similarly, product and process innovation lead to greater return on assets and return on sales (Zahra et al., 2000). Therefore, innovation is a powerful catalyst for financial performance in its many forms.

### **1.5.2.3.3. Financial performance and innovation**

The inverse relationship between financial performance and innovation has also produced significant results. Return on assets has been shown to have a negative impact on R&D (Chen et al., 2018; Han et al., 2015; Upadhyay and Öztekin, 2021) as well as patents and citations



(Chuluun et al., 2017; Matzler et al., 2015; Wu et al., 2021). However, this measure of financial performance has a positive impact on innovation, as measured by an index (Zahra, 1996), organizational and product innovation (Zahra et al., 2000), and patents and citations (Balsmeier et al., 2014; Li, 2021). This suggests that financial performance, as measured by return on assets, has a quasi-systematically negative influence on innovation inputs, but a rather positive influence on innovation outputs.

Return on equity has systematically demonstrated its positive impact on R&D expenditure intensity (Bravo and Reguera-Alvarado, 2017; Deutsch, 2007), internal innovation (Hoskinsson et al., 2011), and patents (Chen et al., 2015). This is also the case with Tobin's Q, whose positive impact on R&D expenditure intensity (Baslmeier et al., 2017) and patents and citations (Baslmeier et al., 2017; Kang et al., 2018) has been empirically supported.

Another indicator of financial performance is sales growth, which has a negative impact on patents and citations (Chuluun et al., 2017; Faleye et al., 2018). However, in terms of its impact on innovation inputs, as measured by R&D expenditure intensity, its effect can be positive (Chuluun et al., 2017) or negative (Faleye et al., 2018; Ghosh, 2016).

Profitability has a positive impact on environmental innovation (Horbach and Jacob, 2017) and R&D expenditure intensity (Kor, 2006), and a firm's revenues provide it with a better capacity to innovate (Robeson and O'Connor, 2013).

These results suggest that firms with better financial performance are more likely to engage in efforts to innovate, that innovation inputs might reduce financial performance over a certain period, and that financial performance helps generate innovation outputs.

#### **1.5.2.3.4. Internationalization, innovation, and financial performance**

Internationalization has also been addressed, albeit marginally. Export growth tends to generate more product and process innovations (Horbach and Jacob, 2017), as well as patents (Helmets et al., 2017). Foreign sales increase both the intensity of R&D expenditure and the introduction of new products (Wu and Wu, 2014), as well as eco-innovation and environmental innovation (García-Sánchez et al., 2021). International diversification can increase innovation inputs (Miller and Triana, 2009), and patents can improve exportations

(Leung and Sharma, 2021). These results contribute to the debate seeking to establish the complementarity or opposition of innovation and internationalization strategies. The results presented above on the basis of the literature on the function of the BoD and innovation suggest their complementarity.

## **1.6. Research agenda and recommendations**

The extensive synthesis of the literature on the link between the BoD and innovation has allowed us to extract several promising avenues for future research and make several recommendations to guide scholars interested in contributing to this field of research. This section is articulated around three themes: (1) analytical frameworks, (2) theoretical constructs, and (3) methodological designs.

### **1.6.1. Analytical frameworks**

#### **1.6.1.1. Board composition beyond traditional measures**

Most studies on the link between the BoD and innovation have focused on board composition. However, one of our key findings is that the results produced by papers focusing on traditional measures of board composition (i.e., independence, size, and diversity) have yielded mixed results, and that these concepts cannot in themselves explain optimally how directors have an impact on innovation. Thus, we suggest incorporating board human and social capital into the analysis to bring a more pragmatic reflection and to better highlight the relevance of board composition for innovation purposes. The three categories formed for human capital and the three observations regarding both board human and social capital seem to be good starting points. Some articles provide guidance for scholars who are interested in these two concepts (e.g., Johnson et al., 2013; Khanna et al., 2014; Kor and Sundaramurthy, 2009; Stevenson and Radin, 2009; Tasheva and Hillman, 2019). We have also presented five dimensions (i.e., board human capital, board social capital, board demographics, board roles, and contingencies) that could be considered in combination with the independence and/or the size and/or the diversity of the BoD to generate richer results and observations/recommendations; that can help authors build their conceptual frameworks.

### **1.6.1.2. Underrepresented board concepts**

Even if a large number of variables were covered in this study thanks to the contingency perspective that was adopted, several concepts remain underrepresented and deserve to be addressed more thoroughly. Some examples are board committees, the presence of directors with specific training in governance or expertise in innovation, the conduct of meetings, the turnover rate, and the use of artificial intelligence. In addition, and more importantly, it would be particularly useful to further document board roles and processes, as well as their underlying connectors (e.g., board effectiveness and cohesiveness). These concepts remain largely unexplored, but they are those that can best explain directors' contributions in terms of innovation. Upstream, this could take the form of a study that seeks to understand how board human and social capital help directors fulfill their roles. Downstream, studies could analyze the way board effectiveness and cohesiveness, and their underlying processes, exert an influence innovation.

### **1.6.1.3. Conceptualization of innovation**

There is an important nuance to be drawn between efforts to innovate and their translation into concrete innovations. Thus, it would be interesting for future studies to focus on the impact of the BoD on both innovation inputs and outputs to determine whether and how they might differ. Our findings also illustrate such a disparity in the measurement of innovation that we cannot, at this time, draw a conclusion about the effect of the BoD. The reliance on indices could be an interesting avenue toward a consensus, as it would provide a more comprehensive approach to innovation and carry great potential in terms of the rationality of the results. For example, it could translate into the use of a construct that includes items measuring both innovation inputs (e.g., R&D intensity) and outputs (e.g., new product introduction). Some articles, even if rare, provide relevant examples of innovation constructs that could inspire future studies that engage in such an exercise (e.g., Wincent et al., 2013; Zahra, 1996; Zona, 2012; Zona et al., 2013).

### **1.6.1.4. Contingency approach**

The use of a contingency approach has highlighted the need to look beyond the BoD to understand its effects on innovation. Within the realm of corporate governance, it would be relevant to include variables related to ownership, the TMT, and the CEO. The concentration

of power, for example, through CEO duality and its potential participation in ownership, could be a promising variable to include when studying the impact of the BoD on innovation. More broadly, several variables should also be considered to analyze the potential effects of an organizations' internal and external environments. Subsequent studies should particularly consider firm age, size, and financial health at the internal level, as well as the sector (industry), partnerships (networks), and geographic context at the external level. Future research would also benefit from integrating other organizational outcomes, such as financial performance and internationalization, given that their impact on innovation has proven to be significant.

## **1.6.2. Theoretical constructs**

### **1.6.2.1. Agency theory**

The descriptive results have shown that agency theory is the dominant theory in this literature, as it is for any subject related to corporate governance. First, it is worth noting that this theory has often failed to establish significant links between corporate governance and organizational outcomes (Kor, 2006; Kumar and Zattoni, 2019). Although it certainly provides the basis for a rich analysis, it also remains controversial (Eisenhardt, 1989) and needs to be refined (Bosse and Phillips, 2016). This could be made possible by using primary data to consider the flow of information to and from the board, as well as other elements that agency theory can address, such as information asymmetry and opportunistic behaviours. More importantly, these facts emphasize the need to explore other theoretical postulates that have, to date, often been ignored. Some alternatives that should be considered in combination with agency theory are presented below. This is obviously not an exhaustive list, but in our humble opinion, it constitutes a good starting point that would make it possible to cover a wide range of themes at the junction of the BoD and innovation.

### **1.6.2.2. Stewardship theory**

Stewardship theory states that leaders do not necessarily act opportunistically and are “self-motivated” (Davis et al., 1997). Their performance is predominantly shaped by the structure in which they find themselves rather than through perceived incentives (Donaldson and Davis, 1991). A fundamental premise of this theory, and one that radically distinguishes it

from agency theory, is that the interests of shareholders and managers are aligned (Muth and Donaldson, 1998). Stewardship theory suggests that the interests of both parties converge toward the interests of the firm (Pugliese et al., 2009); that is to say, individualism is eclipsed in favour of collectivism, which results in putting the organization first. This common interest could hinge on innovation, and it therefore appears relevant to consider how the innovation imperative could serve as a unifying element for principals and agents. In addition, stewardship theory suggests that the main function of the board is to advise rather than monitor managers (Davis et al., 1997), which constitutes another fertile line of research.

### **1.6.2.3. Resource-based theory**

Resource-based theory focuses on the internal environment of organizations by underscoring the value of resources over their quantity (Wernerfelt, 1984). From this perspective, directors, through their human and social capital, can constitute valuable resources that help firms gain a competitive advantage (Barney, 1991; Barney et al., 2001). Their characteristics and abilities to perform their roles effectively and ensure efficient processes could represent important assets for firms. It has also been suggested that directors' attributes could greatly influence board service, advisory and strategic roles (Priem and Butler, 2001). Thus, where resource dependence theory refers primarily to the external environment, resource-based theory is more concerned with what happens inside the firm. This suggests that a combination of both theories could provide a theoretical framework that is particularly conducive to studying the potential impact of the BoD on innovation by placing great importance on both the internal and the external environments.

### **1.6.2.4. Resource dependence theory**

Resource dependence theory could be particularly relevant in investigating how directors' social capital affects firms' innovation performance. It would be interesting to examine how board networks contribute to reducing a firm's dependence on its external environment (Pfeffer and Salancik, 2003), and how this in turn contributes to innovation. Furthermore, this theory allows for a consideration of both BoD' composition (Hillman et al., 2000) and the various roles it is assigned, including advising organizations in different fields, being facilitators in creating links between the organization and its external environment, acting as providers of resources, and increasing firms' legitimacy (Hillman et al., 2000, 2008, 2009;

Hillman and Dalziel, 2003; Pfeffer and Salancik, 2003). In this sense, this theory could also provide an opportunity to document the influence of directors' roles on innovation and how they translate concretely through some board processes, which are two areas in need of further investigation.

#### **1.6.2.5. Stakeholder theory**

Stakeholder theory promotes pluralism (Freeman, 1999). In particular, it refers to the "principle of governance," which translates into the right of each stakeholder to participate in a firm's governance (Freeman and Reed, 1983). This theory raises major issues in the field of corporate governance. Jansson (2005) provided a relevant example by contrasting the contradictory goals of employees who want to increase their salaries and vacation time (which increases firms' costs) and shareholders who want to increase the return on their investments (which decreases firms' costs). This concept, which addresses interactions among various stakeholders, represents an avenue for potentially significant insights that could explain variations in innovation. Interest in this theory also lies in its contribution to decisions. For example, it has been suggested that because employees are affected by decisions made "at the top of the hierarchy," they should be allowed to provide input in the decision-making process (Jansson, 2005). In the same vein, Donaldson and Preston (1995) pointed out that several regions in the world, such as the United States and Japan, have enacted legislation to give a voice to various stakeholders in the decision-making process.

#### **1.6.2.6. Contingency theory**

Contingency theory is based on the principle that the performance of organizations is the result of a set of characteristics, including their structure, size, and environment (Burns and Stalker, 1961; Donaldson, 2001). It has been suggested that a board's composition is contingent upon characteristics related to the organization's external environment, such as uncertainty and diversification (Pearce and Zahra, 1992; Thorgren et al., 2010). Internally, some studies have shown that the impact of the BoD could also be contingent upon factors such as firm size (Zona et al., 2013) and resources (Wu, 2008). In this regard, contingency theory makes it possible to cast a much wider net in terms of concepts and, especially, to consider the complex interactions underlying the link between the BoD and innovation. All the elements related to firms' internal and external environments that have been identified in

this study are therefore interesting to consider as potential moderating and/or mediating variables of this relationship, or at least as control variables, as they have been shown to have a significant, sometimes direct and other times indirect, impact on innovation.

### **1.6.3. Methodological designs**

The methodology used by the studies included in our systematic review is rigorous, which is reflected in the detailed justifications of the choices made and the use of various tests to support the robustness of the results. That being said, we have identified a number of deficiencies from a purely methodological standpoint that should be corrected in the future.

#### **1.6.3.1. Primary data**

There is a need to expand the literature with more quantitative articles based on primary rather than secondary data. The availability of databases containing demographic data on directors may partly explain why studies using secondary databases are the most common. However, these tools may also be the source of redundancy in the variables used, as researchers with access to these databases could lead their studies in the direction of the information they contain. There are some interesting examples to guide scholars in conducting studies based on surveys to investigate the potential impact of directors on innovation (e.g., Arzubiaga et al., 2018; Querbach et al., 2020; Wu and Wu, 2014; Zona et al., 2013; Zona and Zamarian, 2021).

#### **1.6.3.2. Statistical shortcuts**

Studies need to be more nuanced when considering elements such as growth effects. The literature shows evidence of several “statistical shortcuts,” such as using the exponent of certain board variables to explain how an increase could potentially change the significance or sign of the relationship under study. Although commonly used and widely accepted, such practices remain simplistic, have a limited practical scope, and do not allow to capture the complexity of the growth effects. Therefore, it would be better preferable to use a gradual approach, for example, by testing variations of one or two units at a time.

### **1.6.3.3. Qualitative approach**

The literature on the link between the BoD and innovation needs more qualitative studies. The respective and reciprocal importance of the board and innovation for organizations, as well as how they interact, requires a more in-depth understanding that can only be produced through qualitative research. The quantitative approach mainly provides a theoretical and therefore necessarily partial understanding of the identified causal relationships. Studies by Klarner et al. (2020) and Almor et al. (2019) represent the only two exceptions of purely qualitative studies; following their example would be very rewarding.

### **1.6.3.4. Geographical context**

The results show that almost half of the articles referred to the US model of governance. This illustrates a need to further document the link between boards and innovation in the Anglo-Saxon world, but in countries other than the United States (i.e., Canada, the United Kingdom, and Australia), as the Anglo-Saxon governance model is not homogeneous, particularly in terms of individual ownership (Weimer and Pape, 1999). It would also be relevant for future studies to focus on the specificities of governance mechanisms outside the Anglo-Saxon world. The German context, with its “dual board” or “two tier system,” would be fertile ground for research. The same holds for the Japanese governance model, as it differs from other models in several regards, particularly with its concept of “Keiretsu,” which refers to a sense of loyalty that binds various stakeholders. Moreover, other aspects of this model, such as the important position of the central bank and the government, make it a very interesting context for studying the link between the BoD and innovation.

### **1.6.3.5. SMEs**

It is of utmost importance to analyze the impact of directors on innovation in the context of SMEs. The proximity between SMEs’ governance and that of large corporations supports this view. This is reflected by the relevance of independent directors (Rasmussen et al., 2018), as well as the strategic contributions of the CEO (Brunninge et al., 2007; Huse, 2000) in both contexts. On the other hand, the differences in terms of governance (Forbes and Milliken, 1999; Zahra et al., 2007) between these two contexts also support the interest of focusing on SMEs. As such, the clear dominance of studies examining large corporations confirms the recent concern expressed by several authors regarding the lack of papers using



a sample of SMEs (e.g., Arzubiaga et al., 2018; Gnan et al., 2015). This is especially problematic given that SMEs are strongly linked to the economic growth of the countries in which they operate (Van Gils, 2005). Also, the strategic nature of both governance (Brunninge et al., 2007; Huse, 2000) and innovation (Miller and Toulouse, 1986; Madrid-Guijarro et al., 2013) has been supported in the context of SMEs.

#### **1.6.3.6. Financial sector**

The analysis of the sectoral breakdown of the literature on the BoD and innovation provides an opportunity for cross-sectoral comparisons to conduct more in-depth analyses. This also shows that authors have measured the importance of building their sample by considering both the specificities and the technological intensity of certain industries, such as the hi-tech and manufacturing sectors. However, firms in the financial sector tend to be excluded. This is problematic given that several studies on corporate governance underscore the relevance for innovation of both the financial sector in general, and directors with financial sector experience in particular (e.g., Bantel and Jackson, 1989; Ghosh, 2016; Tylecote and Ramirez, 2006). In this regard, studies that exclude the financial domain could miss out on relevant findings, so we believe that this should be avoided in the future.

### **1.7. Conclusion**

#### **1.7.1. Theoretical and empirical contributions**

The systematic approach used in this study has generated what represents, to the best of our knowledge, the first proposal for an integrative conceptual framework regarding the impact of the BoD on innovation. The detailed mapping of this literature has highlighted the concepts at the board level that appear to be the most beneficial, as well as those that appear to be most detrimental to innovation inputs and outputs. Moreover, our in-depth analysis has revealed many underlying elements that can explain these relationships, as well as the often-mixed results that have been produced to date. We went beyond a simple synthesis work by extracting explanations based on the cross-referencing of different studies. Overall, our analysis shows that the BoD is a key tool for organizations to innovate, but it also reveals that directors are not omnipotent for this purpose.

The contingency approach used in this study made it possible to nuance the importance of directors in terms of innovation by illustrating the extent to which indirect relationships, contextual factors, and the distinction between innovation inputs and outputs are crucial. In this regard, while the board is certainly relevant to innovation, any analysis that focuses exclusively on this decisional group is inherently insufficient. Thus, a holistic approach to studying this relationship is not only desirable but essential, and we have provided several justifications that support this assertion.

This paper also provided an opportunity to identify the main limitations of previous studies on the link between the BoD and innovation at the analytical, theoretical, and methodological levels. These aspects have given rise to several promising ideas for future research to contribute to the advancement of knowledge on this topic. Thus, our third major theoretical contribution is that this work represents a compass to direct scholars wishing to investigate the interactions between directors and innovation.

### **1.7.2. Empirical and policy contributions**

This study contributes to raising awareness among organizations regarding the potential contribution of the BoD to innovation. Firms that have already established a BoD can use our results to guide their board members' recruitment and renewal processes toward increasing their capacity for innovation. Organizations that have yet to establish a BoD can take stock of the full range of benefits of implementing such a mechanism to stimulate innovation and know which aspects to prioritize.

In a broader sense, the present research informs organizations that innovation, both in terms of inputs and outputs, is far from being the exclusive responsibility of the BoD. A multitude of factors can explain this outcome, which implies that the influence of the board might be only indirect. This is, for example, supported by the fact that firms' resources are crucial for innovation, which suggests that it is primarily through the allocation and acquisition of resources that the BoD can make a concrete contribution to innovation. Thus, the findings provide organizations with a clear idea of the elements, beyond those relating to directors, that could help them stimulate innovation, as well as those that could represent obstacles. This contribution is even more valuable given that it is generally difficult for companies to

immerse themselves in the scientific literature, which is often viewed as burdensome and/or inaccessible. The exhaustive examination conducted in this study could somewhat bridge the gap between the professional and academic worlds by making information covering a period of 33 years available to organizations, including insights from 114 papers, in a single document.

Finally, the conclusions of this paper can provide government authorities with guidance on the importance of corporate governance for innovation. In this regard, rather than limiting their assistance to measures such as granting R&D tax credits, they may be well advised to provide financial support to improve governance practices. Government authorities could, for example, cover the expenses of corporate governance training or set up a project aimed at producing a guide for good governance practices when the goal is to stimulate innovation.

### **1.7.3. Limitations and concluding remarks**

This study used an exhaustive and integrative analysis approach based on a systematic literature review protocol. Such an expansive endeavour, all the more so when conducted from a contingency perspective, can at times result in surface rather than in-depth analysis. This is particularly true when examining concepts beyond those directly related to the BoD. These concepts, however, have proven to be crucial given their direct effects on innovation, as reported by studies focusing on the link between the BoD and innovation.

Moreover, even though limiting the analysis to articles published within a certain calibre of scientific journals, as well as to empirical papers, are practices that are recommended and justified for building a systematic literature review protocol, such choices deprive the analysis of information that could certainly have provided further contributions. This also suggests the possibility that some findings and recommendations may differ in the event that inclusion/exclusion criteria were to be expanded.

It should also be noted that a systematic review should ideally lead to a meta-analysis. However, the quantity of variables and the heterogeneity of the measures used to assess the concepts related to both the BoD and innovation did not allow for such an exercise, which would have made it possible to go further in the conclusions by documenting the combined

effects of the empirical results and supporting the causal links identified on statistical rather than narrative bases.

In short, this article demonstrates the importance of looking specifically at the BoD to explain the capacity of firms to innovate, both in terms of inputs and outputs, while emphasizing the need to consider the contingencies with which organizations must deal and that can affect this link. We hope that this work will open the door to many contributions in this field of research, which sits at the junction of two major concepts for any organization today.

## 1.8. References

- Aaboen, L., Lindelof, P., Christopher von, K., & Lofsten, H. (2006). Corporate governance and performance of small high-tech firms in Sweden. *Technovation*, 26, 955-968.
- Åberg, C., Bankewitz, M., & Knockaert, M. (2019). Service tasks of board of directors: A literature review and research agenda in an era of new governance practices. *European Management Journal*, 37, 648-663.
- Aguilera, R. V., & Crespi-Cladera, R. (2016). Global corporate governance: On the relevance of firms' ownership structure. *Journal of World Business*, 51, 50-57.
- Almor, T., Bazel-Shoham, O., & Lee, S. M. (2019). The dual effect of board gender diversity on R&D investments. *Long Range Planning* (in press), 55, 101884.
- Attah-Boakye, R., Adams, K., Kimani, D., & Ullah, S. (2020). The impact of board gender diversity and national culture on corporate innovation: A multi-country analysis of multinational corporations operating in emerging economies. *Technological Forecasting and Social Change*, 161, 120247.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Ashwin, A. S., Krishnan, R. T., & George, R. (2015). Family firms in India: Family involvement, innovation and agency and stewardship behaviors. *Asia Pacific Journal of Management*, 32, 869-900.
- Baker, H. K., Pandey, N., Kumar, S., & Haldar, A. (2020). A bibliometric analysis of board diversity: Current status, development, and future research directions. *Journal of Business Research*, 108, 232-246.
- Balsmeier, B., Buchwald, A., & Stiebale, J. (2014). Outside directors on the board and innovative firm performance. *Research Policy*, 43, 1800-1815.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Banbury, C. M., & Mitchell, W. (1995). The effect of introducing important incremental innovations on market share and business survival. *Strategic Management Journal*, 16, 161-182.
- Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference?. *Strategic Management Journal*, 10, 107-124.

- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, 27, 643-650.
- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Baumann, J., & Kritikos, A. S. (2016). The link between R&D, innovation and productivity: Are micro firms different?. *Research Policy*, 45, 1263-1274.
- Baysinger, B. D., Kosnik, R. D., & Turk, T. A. (1991). Effects of board and ownership structure on corporate R&D strategy. *Academy of Management Journal*, 34, 205-214.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Benkraiem, R., Boubaker, S., Brinette, S., & Khemiri, S. (2021). Board feminization and innovation through corporate venture capital investments: The moderating effects of independence and management skills. *Technological Forecasting and Social Change* (in press), 163, 120467.
- Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, 127, 588-612.
- Bezemer, P. J., Pugliese, A., Nicholson, G., & Zattoni, A. (2022). Toward a synthesis of the board-strategy relationship: A literature review and future research agenda. *Corporate Governance: An International Review* (in press).
- Black, S. E., & Lynch, L. M. (2004). What's driving the new economy?: The benefits of workplace innovation. *The Economic Journal*, 114, 97-116.
- Bommaraju, R., Ahearne, M., Krause, R., & Tirunillai, S. (2019). Does a Customer on the Board of Directors Affect Business-to-Business Firm Performance? *Journal of Marketing*, 83, 8-23.
- Bosse, D. A., & Phillips, R. A. (2016). Agency theory and bounded self-interest. *Academy of Management Review*, 41, 276-297.
- Boyd, B. K., Gove, S., & Solarino, A. M. (2017). Methodological rigor of corporate governance studies: A review and recommendations for future studies. *Corporate Governance: An International Review*, 25, 384-396.
- Boyd, B. K., & Solarino, A. M. (2016). Ownership of corporations: A review, synthesis, and research agenda. *Journal of Management*, 42, 1282-1314.
- Bravo, F., & Reguera-Alvarado, N. (2017). The effect of board of directors on R&D intensity: board tenure and multiple directorships. *R&D Management*, 47, 701-714.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Burns, T., & Stalker, G. M. (1961). *The management of innovation*. London: Tavistock.
- Camisón-Zornoza, C., Lapiedra-Alcamí, R., Segarra-Ciprés, M., & Boronat-Navarro, M. (2004). A meta-analysis of innovation and organizational size. *Organization Studies*, 25, 331-361.
- Cai, J., & Nguyen, T. (2018). Disciplinary directors: Evidence from the appointments of outside directors who have fired CEOs. *Journal of Banking & Finance*, 96, 221-235.

- Canil, J., Karpavičius, S., & Yu, C. F. (2021). TMT gender diversity: implications for corporate tournaments and innovation. *The European Journal of Finance*, 27, 1765-1790.
- Cao, S., Fang, Z., Pu, W., & Ruan, Y. Y. (2021). Vertical Interlock and Firm Value: The Role of Corporate Innovation. *Emerging Markets Finance and Trade*, 58, 1061-1077.
- Cassiman, B., & Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42, 56-75.
- Cefis, E., & Marsili, O. (2006). Survivor: The role of innovation in firms' survival. *Research Policy*, 35, 626-641.
- Cefis, E., & Marsili, O. (2019). Good times, bad times: innovation and survival over the business cycle. *Industrial and Corporate Change*, 28, 565-587.
- Celikyurt, U., Sevilir, M., & Shivdasani, A. (2014). Venture Capitalists on Boards of Mature Public Firms. *Review of Financial Studies*, 27, 56-101.
- Certo, S. T., Lester, R. H., Dalton, C. M., & Dalton, D. R. (2006). Top management teams, strategy and financial performance: A meta-analytic examination. *Journal of Management Studies*, 43, 813-839.
- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.
- Chen, J. (2020). A juggling act: CEO polychronicity and firm innovation. *The Leadership Quarterly*, 101380.
- Chen, C. J., Lin, B. W., Lin, Y. H., & Hsiao, Y. C. (2016). Ownership structure, independent board members and innovation performance: A contingency perspective. *Journal of Business Research*, 69, 3371-3379.
- Chen, H. L. (2014). Board Capital, CEO Power and R&D Investment in Electronics Firms. *Corporate Governance-an International Review*, 22, 422-436.
- Chen, H. L., Ho, M. H. C., & Hsu, W. T. (2013). Does board social capital influence chief executive officers' investment decisions in research and development? *R&D Management*, 43, 381-393.
- Chen, H. L., & Hsu, W. T. (2009). Family Ownership, Board Independence, and R&D Investment. *Family Business Review*, 22, 347-362.
- Chen, J., Leung, W. S., & Evans, K. P. (2018). Female board representation, corporate innovation and firm performance. *Journal of Empirical Finance*, 48, 236-254.
- Chen, S. M., Bu, M., Wu, S. B., & Liang, X. (2015). How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance. *Journal of Business Research*, 68, 1127-1135.
- Chen, S. M., Ni, X., & Tong, J. Y. (2016). Gender Diversity in the Boardroom and Risk Management: A Case of R&D Investment. *Journal of Business Ethics*, 136, 599-621.
- Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics*, 87, 157-176.
- Choi, J., Rhee, M., & Kim, Y. C. (2019). Performance feedback and problemistic search: The moderating effects of managerial and board outsidersness. *Journal of Business Research*, 102, 21-33.
- Chuluun, T., Prevost, A., & Upadhyay, A. (2017). Firm network structure and innovation. *Journal of Corporate Finance*, 44, 193-214.
- Coad, A., Segarra, A., & Teruel, M. (2016). Innovation and firm growth: does firm age play a role?. *Research Policy*, 45, 387-400.

- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics*, 87, 329-356.
- Cook, A., & Glass, C. (2015). Do minority leaders affect corporate practice? Analyzing the effect of leadership composition on governance and product development. *Strategic Organization*, 13, 117-140.
- Crescenzi, R., & Gagliardi, L. (2018). The innovative performance of firms in heterogeneous environments: The interplay between external knowledge and internal absorptive capacities. *Research Policy*, 47, 782-795.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47, 1154-1191.
- Cumming, D., & Leung, T. Y. (2021). Board diversity and corporate innovation: Regional demographics and industry context. *Corporate Governance: An International Review*, 29, 277-296.
- Cuomo, F., Mallin, C., & Zattoni, A. (2016). Corporate governance codes: A review and research agenda. *Corporate Governance: An International Review*, 24, 222-241.
- Dalziel, T., Gentry, R. J., & Bowerman, M. (2011). An Integrated Agency-Resource Dependence View of the Influence of Directors' Human and Relational Capital on Firms' R&D Spending. *Journal of Management Studies*, 48, 1217-1242.
- Damanpour, F. (1992). Organizational size and innovation. *Organization Studies*, 13, 375-402.
- Dangelico, R. M. (2016). Green product innovation: where we are and where we are going. *Business Strategy and the Environment*, 25, 560-576.
- David, P., Hitt, M. A., & Gimeno, J. (2001). The influence of activism by institutional investors on R&D. *Academy of Management Journal*, 44, 144-157.
- Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Davis, Schoorman, and Donaldson reply: The distinctiveness of agency theory and stewardship theory. *Academy of Management Review*, 22, 611-613.
- Demirag, I. S. (1998). Boards of Directors' short-term perceptions and evidence of managerial short-termism in the UK. *European Journal of Finance*, 4, 195-211.
- Denyer, D. and Tranfield, D. (2009), Producing a systematic review, in Buchanan, D. and Bryman, A. (Eds), *The Sage Handbook of Organizational Research Methods*, Sage Publications, London.
- Deutsch, Y. (2007). The influence of outside directors' stock-option compensation on firms' R&D. *Corporate Governance: An International Review*, 15, 816-827.
- Díaz-Díaz, N. L., López-Iturriaga, F. J., & Santana-Martín, D. J. (2021). The role of political ties and political uncertainty in corporate innovation. *Long Range Planning* (in press), 55, 102111.
- Diestre, L., Rajagopalan, N., & Dutta, S. (2015). Constraints in acquiring and utilizing directors' governance: An empirical study of new-market entry in the pharmaceutical industry. *Strategic Management Journal*, 36, 339-359.
- Donaldson, L. (2001). *The contingency theory of organizations*. Sage.
- Donaldson, L., & Davis, J. H. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management*, 16, 49-64.
- Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review*, 20, 65-91.

- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate governance: An International Review*, 11, 102-111.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14, 57-74.
- Faleye, O., Hoitash, R., & Hoitash, U. (2011). The costs of intense board monitoring. *Journal of Financial Economics*, 101, 160-181.
- Faleye, O., Hoitash, R., & Hoitash, U. (2018). Industry expertise on corporate boards. *Review of Quantitative Finance and Accounting*, 50, 441-479.
- Faleye, O., Kung, W., Parwada, J. T., & Tian, G. Y. (2020). Are entrepreneurs special? Evidence from board appointments. *Journal of Business Venturing*, 35, 106003.
- Feldman, M. P. (1993). An examination of the geography of innovation. *Industrial and Corporate Change*, 2, 451-470.
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- Foss, N. J., Klein, P. G., Lien, L. B., Zellweger, T., & Zenger, T. (2021). Ownership competence. *Strategic Management Journal*, 42, 302-328.
- Francis, B., Hasan, I., & Wu, Q. (2015). Professors in the Boardroom and Their Impact on Corporate Governance and Firm Performance. *Financial Management*, 44, 547-581.
- Freeman, R. E. (1999). Divergent stakeholder theory. *Academy of Management Review*, 24, 233-236.
- Freeman, R. E., & Reed, D. L. (1983). Stockholders and stakeholders: A new perspective on corporate governance. *California Management Review*, 25, 88-106.
- García-Sánchez, I. M., Gallego-Álvarez, I., & Zafra-Gómez, J. L. (2021). Do independent, female and specialist directors promote eco-innovation and eco-design in agri-food firms?. *Business Strategy and the Environment*, 30, 1136-1152.
- Ge, W. X., & Kim, J. B. (2014). Boards, takeover protection, and real earnings management. *Review of Quantitative Finance and Accounting*, 43, 651-682.
- Ghosh, S. (2016). Banker on board and innovative activity. *Journal of Business Research*, 69, 4205-4214.
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Griffin, D., Li, K., & Xu, T. (2021). Board gender diversity and corporate innovation: International evidence. *Journal of Financial and Quantitative Analysis*, 56, 123-154.
- Guldiken, O., & Darendeli, I. S. (2016). Too much of a good thing: Board monitoring and R&D investments. *Journal of Business Research*, 69, 2931-2938.
- Hill, L. A., & Davis, G. (2017). The board's new innovation imperative. *Harvard Business Review*, 95, 102-109.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9, 193-206.
- Han, J., Bose, I., Hu, N., Qi, B. L., & Tian, G. L. (2015). Does director interlock impact corporate R&D investment? *Decision Support Systems*, 71, 28-36.
- Harjoto, M. A., Laksmana, I., & Yang, Y. W. (2018). Board diversity and corporate investment oversight. *Journal of Business Research*, 90, 40-47.



- Hasan, I., & Tucci, C. L. (2010). The innovation–economic growth nexus: Global evidence. *Research Policy*, 39, 1264-127.
- Haynes, K. T., & Hillman, A. (2010). The effect of board capital and CEO power on strategic change. *Strategic Management Journal*, 31, 1145-1163.
- Haxhi, I., & Aguilera, R. V. (2017). An institutional configurational approach to cross-national diversity in corporate governance. *Journal of Management Studies*, 54, 261-303.
- He, X. P., & Jiang, S. (2019). Does gender diversity matter for green innovation? *Business Strategy and the Environment*, 28, 1341-1356.
- Helmers, C., Patnam, M., & Rau, P. R. (2017). Do board interlocks increase innovation? Evidence from a corporate governance reform in India. *Journal of Banking & Finance*, 80, 51-70.
- Hill, C. W., & Snell, S. A. (1988). External control, corporate strategy, and firm performance in research-intensive industries. *Strategic Management Journal*, 9, 577-590.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37, 235-256.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28, 383-396.
- Hillman, A. J., Nicholson, G., & Shropshire, C. (2008). Directors' multiple identities, identification, and board monitoring and resource provision. *Organization Science*, 19, 441-456.
- Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource dependence theory: A review. *Journal of Management*, 35, 1404-1427.
- Horbach, J., & Jacob, J. (2018). The relevance of personal characteristics and gender diversity for (eco-)innovation activities at the firm-level: Results from a linked employer–employee database in Germany. *Business Strategy and the Environment*, 27, 924-934.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Grossman, W. (2002). Conflicting voices: The effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, 45, 697-716.
- Huergo, E., & Jaumandreu, J. (2004). How does probability of innovation change with firm age?. *Small Business Economics*, 22, 193-207.
- Hung, K. P., & Chou, C. (2013). The impact of open innovation on firm performance: The moderating effects of internal R&D and environmental turbulence. *Technovation*, 33, 368-380.
- Iyer, S. R., Sankaran, H., & Zhang, Y. (2020). Do Well-Connected Boards Invest Optimally In R&D Activities?. *Journal of Financial Research*, 43, 895-932.
- Jansson, E. (2005). The stakeholder model: the influence of the ownership and governance structures. *Journal of Business Ethics*, 56, 1-13.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.

- Jensen, M., & Zajac, E. J. (2004). Corporate elites and corporate strategy: How demographic preferences and structural position shape the scope of the firm. *Strategic Management Journal*, 25, 507-524.
- Jia, N. (2017). Should Directors Have Term Limits? – Evidence from Corporate Innovation. *European Accounting Review*, 26, 755-785.
- Jiang, F., Shi, W., & Zheng, X. (2020). Board chairs and R&D investment: Evidence from Chinese family-controlled firms. *Journal of Business Research*, 112, 109-118.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Jugend, D., Jabbour, C. J. C., Scaliza, J. A. A., Rocha, R. S., Junior, J. A. G., Latan, H., & Salgado, M. H. (2018). Relationships among open innovation, innovative performance, government support and firm size: Comparing Brazilian firms embracing different levels of radicalism in innovation. *Technovation*, 74, 54-65.
- Kang, J. K., Liu, W. L., Low, A., & Zhang, L. (2018). Friendly boards and innovation. *Journal of Empirical Finance*, 45, 1-25.
- Kang, S., Kim, E. H., & Lu, Y. (2018). Does Independent Directors' CEO Experience Matter? *Review of Finance*, 22, 905-949.
- Katila, R., Thatchenkery, S., Christensen, M. Q., & Zenios, S. (2017). Is there a doctor in the house? Expert product users, organizational roles and innovation. *Academy of Management Journal*, 60, 2415-2437.
- Khanna, P., Jones, C. D., & Boivie, S. (2014). Director human capital, information processing demands, and board effectiveness. *Journal of Management*, 40, 557-585.
- Kim, H., Park, N. K., & Lee, J. (2014). How does the second-order learning process moderate the relationship between innovation inputs and outputs of large Korean firms? *Asia Pacific Journal of Management*, 31, 69-103.
- Kirsch, A. (2018). The gender composition of corporate boards: A review and research agenda. *The Leadership Quarterly*, 29, 346-364.
- Kitchenham, B. (2004). Procedures for performing systematic reviews. Keele, UK, Keele University, 33, 1-26.
- Ko, Y. J., O'Neill, H., & Xie, X. (2021). Strategic intent as a contingency of the relationship between external knowledge and firm innovation. *Technovation* (in press), 104, 102260.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- Kor, Y. Y., & Sundaramurthy, C. (2009). Experience-based human capital and social capital of outside directors. *Journal of Management*, 35, 981-1006.
- Klarner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2–11.
- Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18, 399-429.

- Leung, T. Y., & Sharma, P. (2021). Differences in the impact of R&D intensity and R&D internationalization on firm performance—Mediating role of innovation performance. *Journal of Business Research*, 131, 81-91.
- Li, M. X. (2019). Diversity of Board Interlocks and the Impact on Technological Exploration: A Longitudinal Study. *Journal of Product Innovation Management*, 36, 490-512.
- Li, Y. X., & He, C. (2021). Board diversity and corporate innovation: Evidence from Chinese listed firms. *International Journal of Finance & Economics*, 1-24.
- Li, J., Li, M., Wang, X., & Thatcher, J. B. (2021). Strategic Directions for AI: The Role of CIOs and Boards of Directors. *Management Information Systems Quarterly*, 45, 1603-1644.
- Liang, Q., Li, X. C., Yang, X. R., Lin, D. M., & Zheng, D. H. (2013). How does family involvement affect innovation in China? *Asia Pacific Journal of Management*, 30, 677-695.
- Lim, E. N. K. (2015). The role of reference point in CEO restricted stock and its impact on R&D intensity in high-technology firms. *Strategic Management Journal*, 36, 872-889.
- Lim, E. N. K., & McCann, B. T. (2014). Performance Feedback and Firm Risk Taking: The Moderating Effects of CEO and Outside Director Stock Options. *Organization Science*, 25, 262-282.
- Lin, W.-C., & Chang, S.-c. (2012). Corporate governance and the stock market reaction to new product announcements. *Review of Quantitative Finance and Accounting*, 39, 273-291.
- Lu, J., & Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, 48, 1-16.
- Lu, J., Mahmoudian, F., Yu, D., Nazari, J. A., & Herremans, I. M. (2021). Board interlocks, absorptive capacity, and environmental performance. *Business Strategy and the Environment*, 30, 3425-3443.
- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Ma, S., Kor, Y. Y., & Seidl, D. (2020). CEO advice seeking: An integrative framework and future research agenda. *Journal of Management*, 46, 771-805.
- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & Van Auken, H. (2013). An investigation of Spanish SME innovation during different economic conditions. *Journal of Small Business Management*, 51, 578-601.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The Impact of Family Ownership, Management, and Governance on Innovation. *Journal of Product Innovation Management*, 32, 319-333.
- Mazzola, E., Perrone, G., & Kamuriwo, D. S. (2016). The interaction between inter-firm and interlocking directorate networks on firm's new product development outcomes. *Journal of Business Research*, 69, 672-682.
- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management Studies*, 46, 755-786.
- Miller, D., & Toulouse, J. M. (1986). Chief executive personality and corporate strategy and structure in small firms. *Management Science*, 32, 1389-1409.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.

- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., ... & Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4, 1-9.
- Muth, M., & Donaldson, L. (1998). Stewardship theory and board structure: A contingency approach. *Corporate Governance: An International Review*, 6, 5-28.
- Nadeem, M., Bahadar, S., Gull, A. A., & Iqbal, U. (2020). Are women eco-friendly? Board gender diversity and environmental innovation. *Business Strategy and the Environment*, 29, 3146-3161.
- Narayan, S., Sidhu, J. S., & Volberda, H. W. (2021). From attention to action: The influence of cognitive and ideological diversity in top management teams on business model innovation. *Journal of Management Studies*, 58, 2082-2110.
- Nguyen, T. H. H., Ntim, C. G., & Malagila, J. K. (2020). Women on corporate boards and corporate financial and non-financial performance: A systematic literature review and future research agenda. *International Review of Financial Analysis*, 71, 1-24.
- OECD (2021). SME and Entrepreneurship Outlook 2021. Disponible à travers le lien suivant : <https://www.oecd.org/publications/oecd-sme-and-entrepreneurship-outlook-2021-97a5bbfe-en.htm>
- Osma, B. G. (2008). Board independence and real earnings management: The case of R&D expenditure. *Corporate Governance: An International Review*, 16, 116-131.
- Paik, Y., & Woo, H. (2017). The effects of corporate venture capital, founder incumbency, and their interaction on entrepreneurial firms' R&D investment strategies. *Organization Science*, 28, 670-689.
- Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know?. *International Business Review*, 29, 101717.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pellegrino, G., & Savona, M. (2017). No money, no honey? Financial versus knowledge and demand constraints on innovation. *Research Policy*, 46, 510-521.
- Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, 13, 5-16.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Post, C., Sarala, R., Gatrell, C., & Prescott, J. E. (2020). Advancing theory with review articles. *Journal of Management Studies*, 57, 351-376.
- Priem, R. L., & Butler, J. E. (2001). Is the resource-based "view" a useful perspective for strategic management research?. *Academy of Management Review*, 26, 22-40.
- Pugliese, A., Bezemer, P. J., Zattoni, A., Huse, M., Van den Bosch, F. A., & Volberda, H. W. (2009). Boards of directors' contribution to strategy: A literature review and research agenda. *Corporate Governance: An International Review*, 17, 292-306.
- Purkayastha, S., Manolova, T. S., & Edelman, L. F. (2018). Business group effects on the R&D intensity-internationalization relationship: Empirical evidence from India. *Journal of World Business*, 53, 104-117.

- Qian, C., Cao, Q., & Takeuchi, R. (2013). Top management team functional diversity and organizational innovation in China: The moderating effects of environment. *Strategic Management Journal*, 34, 110-120.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the former CEO stays on board: The role of the predecessor's board retention for product innovation in family firms. *Journal of Product Innovation Management*, 37, 184-207.
- Rasmussen, C. C., Ladegård, G., & Korhonen-Sande, S. (2018). Growth intentions and board composition in high-growth firms. *Journal of Small Business Management*, 56, 601-617.
- Ravasi, D., & Zattoni, A. (2006). Exploring the political side of board involvement in strategy: A study of mixed-ownership institutions. *Journal of Management Studies*, 43, 1671-1702.
- Roberts, P. W. (1999). Product innovation, product-market competition and persistent profitability in the US pharmaceutical industry. *Strategic Management Journal*, 20, 655-670.
- Robeson, D., & O'Connor, G. C. (2013). Boards of Directors, Innovation, and Performance: An Exploration at Multiple Levels. *Journal of Product Innovation Management*, 30, 608-625.
- Rodrigues, R., Samagaio, A., & Felício, T. (2020). Corporate governance and R&D investment by European listed companies. *Journal of Business Research*, 115, 289-295.
- Sariol, A. M., & Abebe, M. A. (2017). The influence of CEO power on explorative and exploitative organizational innovation. *Journal of Business Research*, 73, 38-45.
- Schaedler, L., Graf-Vlachy, L., & König, A. (2021). Strategic leadership in organizational crises: A review and research agenda. *Long Range Planning* (in press), 102156.
- Schiehl, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, Pivot and Advisory Boards: The Role of Governance Configurations in Innovation Commitment. *Organization Studies*, 39, 1449-1472.
- Schilke, O. (2018). A micro-institutional inquiry into resistance to environmental pressures. *Academy of Management Journal*, 61, 1431-1466.
- Schumpeter, J.A. (1934) *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press, Cambridge, MA
- Sena, V., Duygun, M., Lubrano, G., Marra, M., & Shaban, M. (2018). Board independence, corruption and innovation. Some evidence on UK subsidiaries. *Journal of Corporate Finance*, 50, 22-43.
- Shaikh, I. A., O'Brien, J. P., & Peters, L. (2018). Inside directors and the underinvestment of financial slack towards R&D-intensity in high-technology firms. *Journal of Business Research*, 82, 192-201.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly*, 1-26.
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333-339.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate Board Interlocks and New Product Introductions. *Journal of Marketing*, 82, 132-148.
- Staples, M., & Niazi, M. (2007). Experiences using systematic review guidelines. *Journal of Systems and Software*, 80, 1425-1437.

- Stevenson, W. B., & Radin, R. F. (2009). Social capital and social influence on the board of directors. *Journal of Management Studies*, 46, 16-44.
- Talke, K., Salomo, S., & Rost, K. (2010). How top management team diversity affects innovativeness and performance via the strategic choice to focus on innovation fields. *Research Policy*, 39, 907-918.
- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Thorgren, S., Wincent, J., & Anokhin, S. (2010). The importance of compensating strategic network board members for network performance: a contingency approach. *British Journal of Management*, 21, 131-151.
- Torchia, M., Calabro, A., & Huse, M. (2011). Women Directors on Corporate Boards: From Tokenism to Critical Mass. *Journal of Business Ethics*, 102, 299-317.
- Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review*, 15, 404-428.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14, 207-222.
- Tylecote, A., & Ramirez, P. (2006). Corporate governance and innovation: The UK compared with the US and 'insider' economies. *Research Policy*, 35, 160-180.
- Usman, M., Javed, M., & Yin, J. (2020). Board internationalization and green innovation. *Economics Letters*, 197, 109625.
- Vandenbroucke, E., Knockaert, M., & Ucbasaran, D. (2016). Outside Board Human Capital and Early Stage High-Tech Firm Performance. *Entrepreneurship: Theory and Practice*, 40, 759-779.
- Von Zedtwitz, M., Corsi, S., Sjøberg, P. V., & Frega, R. (2015). A typology of reverse innovation. *Journal of Product Innovation Management*, 32, 12-28.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5, 171-180.
- Weimer, J., & Pape, J. (1999). A taxonomy of systems of corporate governance. *Corporate Governance: An International Review*, 7, 152-166.
- Wincent, J., Anokhin, S., & Boter, H. (2009). Network board continuity and effectiveness of open innovation in Swedish strategic small-firm networks. *R&D Management*, 39, 55-67.
- Wincent, J., Anokhin, S., & Ortqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME networks. *Journal of Business Research*, 63, 265-275.
- Wincent, J., Anokhin, S., & Ortqvist, D. (2013). Supporting innovation in government-sponsored networks: The role of network board composition. *International Small Business Journal-Researching Entrepreneurship*, 31, 997-1020.
- Wincent, J., Thorgren, S., & Anokhin, S. (2013). Managing Maturing Government-Supported Networks: The Shift from Monitoring to Embeddedness Controls. *British Journal of Management*, 24, 480-497.
- Weiss, M., Hoegl, M., & Gibbert, M. (2011). Making virtue of necessity: The role of team climate for innovation in resource-constrained innovation projects. *Journal of Product Innovation Management*, 28, 196-207.

- Wu, H-L. (2008). How do Board–CEO Relationships Influence the Performance of New Product Introduction? Moving from Single to Interdependent Explanations. *Corporate Governance: An International Review*, 16, 77-89.
- Wu, H. L. (2008). When does internal governance make firms innovative? *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. F. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yoo, T., & Sung, T. (2015). How outside directors facilitate corporate R&D investment? Evidence from large Korean firms. *Journal of Business Research*, 68, 1251-1260.
- Yoon, B., Jeong, Y., Lee, K., & Lee, S. (2020). A systematic approach to prioritizing R&D projects based on customer-perceived value using opinion mining. *Technovation*, 98, 102164.
- Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, 39, 1713-1735.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zenou, E., Allemand, I., Brullebaut, B., & Galia, F. (2020). Board recruitment as a strategic answer: Do companies' strategies for innovation influence the selection of new board members?. *Strategic Change*, 29, 127-139.
- Zhang, Q., Chen, L. L., & Feng, T. J. (2014). Mediation or Moderation? The Role of R&D Investment in the Relationship between Corporate Governance and Firm Performance: Empirical Evidence from the Chinese IT Industry. *Corporate Governance: An International Review*, 22, 501-517.
- Zona, F. (2012). Corporate Investing as a Response to Economic Downturn: Prospect Theory, the Behavioural Agency Model and the Role of Financial Slack. *British Journal of Management*, 23, 42-57.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.
- Zona, F., & Zamarian, M. (2022). The Behavioral Agency Model and Innovation Investment: Examining the Combined Effects of CEO and Board Ownership. *Group & Organization Management*, 47, 647-678.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A Contingency Model of Boards of Directors and Firm Innovation: The Moderating Role of Firm Size. *British Journal of Management*, 24, 299-315.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.

## **Chapitre 2 : Article 2 – The impact of board of directors' composition, roles, and effectiveness on innovation in small and medium-sized enterprises: A multistage theorization and experimentation**

### **2.1. Résumé**

Cet article analyse l'impact de la composition (c.-à-d. taille, indépendance et capital humain), des rôles (c.-à-d. contrôle et stratégie) et de l'efficacité du CA (c.-à-d. contributions historiques) sur l'innovation dans les PME. Une théorisation originale y est développée sur la base de divers postulats théoriques, d'un échantillon de 300 PME et de diverses facettes du CA. L'expérimentation conduite à travers une modélisation par équations structurelles suggère que l'influence du CA sur l'innovation se traduit par un processus séquentiel en quatre étapes et que certaines contingences sont également importantes à des fins d'innovation. Concrètement, il en ressort que l'augmentation de la taille et l'indépendance réduirait le capital humain du CA, que ce dernier est l'élément qui permet au CA de s'acquitter de son rôle stratégique, et que ce rôle spécifique régirait l'efficacité du CA, laquelle représente le chaînon qui lie le CA à l'innovation.

**Mots-clés:** Conseil d'administration; Composition; Rôles; Efficacité; Innovation; PME.



## **2.2. Abstract**

This article analyzes the impact of board composition (i.e., size, independence, and human capital), roles (i.e., control and strategy), and board effectiveness (i.e., historical contributions) on innovation in SMEs. An original theorization is developed based on various theoretical postulates, a sample of 300 SMEs and various facets of the BoD. The experimentation conducted through structural equation modeling suggests that the influence of the BoD on innovation results from a four-stage sequential process and that some contingencies are also important to innovate. Concretely, it reveals that the increase in size and independence would reduce the human capital within the BoD, that this last aspect is the element which allows the BoD to fulfill its strategic role, and that this specific role would govern board effectiveness, which represents the factor that binds the BoD to innovation.

**Keywords:** Board of directors; Composition; Roles; Effectiveness; Innovation; SMEs.

### **2.3. Introduction**

SMEs represent a major part of the economic fabric of any country (Mei et al., 2019; Mínguez-Vera and Martin, 2011; Van Gils, 2005). The strategic nature of innovation for these firms has been underlined by several scholars (Ejdemo and Örtqvist, 2020; Love and Roper, 2015; Madrid-Guijarro et al., 2013), particularly for sustaining growth (Guo et al., 2017; Prange and Pinho, 2017; Rodríguez and Nieto, 2016). The importance of governance for SMEs has been emphasized many times over the past two decades (Huse, 2000; Li et al., 2020; Zahra et al., 2007), more specifically through the BoD and its strategic involvement (Diestre et al., 2015; Querbach et al., 2020; Vandenbroucke et al., 2016), which can be reflected in the BoD's potential contribution to innovation (Arzubiaga et al., 2018; Klarner et al., 2020; Schiehl et al., 2018). Thus, research at the junction of the BoD and innovation, especially when conducted in the context of SMEs, is of great interest from both scientific and practical points of view.

However, despite enriching contributions since the publication of the first study that examined the link between the BoD and innovation more than three decades ago (Hill and Snell, 1988), little is known about how this link actually operates, and this field of research has produced mixed results (Balsmeier et al., 2017; Chang and Wu, 2021; Matzler et al., 2015). This literature also reveals some methodological and theoretical issues that partly explain the two previous observations (i.e., limited understanding and mixed results). This is reflected in particular by the fact that previous studies have almost always systematically relied on large corporations, secondary data, the context of the United States, and the exclusive postulates of agency theory (Arzubiaga et al., 2018; Baysinger et al., 1991; Dalziel et al., 2011; Kurzhals et al., 2020; Robeson and O'Connor, 2013; Zahra et al., 2000). Furthermore, it translates into a lack of consideration of the environment in which firms operate, which appears to have a non-negligible impact on innovation (Chen et al., 2016; Lim and McCann, 2014; Zona et al., 2013). Indeed, boards' contributions to organizational outcomes are contingent on characteristics related to firms' internal and external environment (Huse, 2000; Pearce and Zahra, 1992; Thorgren et al., 2010; Wu, 2008; Wu and Wu, 2014). These observations imply that, to date, we have only a partial, narrow, and oriented understanding of the link between the BoD and innovation.

Acknowledging these facts, recent studies have tried to shed some light on this complex phenomenon. These papers have shown, for example, that aspects related to board composition, such as the presence of female directors and the pool of skills within the BoD, are relevant in explaining innovation in SMEs (e.g., Baum et al., 2022; Bauweraerts et al., 2022). That being said, when it comes to board composition, human capital has often been ignored when analyzing the link between BoD and innovation. This needs to be highlighted because what is true at the organizational level—that human capital ranks among the most important assets for organizations in terms of performance (Fulmer and Ployhart, 2014)—could also be true at the executive level (Chemmanur et al., 2020; Nasirov et al., 2021; Zarutskie, 2010) and, more specifically, at the board level (Haynes and Hillman, 2010; Johnson et al., 2013; Tasheva and Hillman, 2019). Furthermore, human capital has been considered a source of competitive advantage and an antecedent of various organizational outcomes (Khanna et al., 2014; Stevenson and Radin, 2009; Vandenbroucke et al., 2016), including innovation (Bonesso et al., 2020; Tzabbar and Margolis, 2017). These observations support our choice to consider board human capital in addition to the traditional variables in terms of board composition, such as board size and independence.

It also seems necessary to broaden the analysis by adopting an analytic framework that goes beyond board composition. On this subject, the literature shows a tendency to focus on either board composition or board roles (Bendig et al., 2020; Miller and Triana, 2009), which is not optimal, given that the two are closely related (Bernile et al., 2018; Pearce and Zahra, 1992). Furthermore, both board composition (Hillman et al., 2000; Zona, 2016) and board roles (Forbes and Milliken, 1999; Zattoni et al., 2015) could explain organizational performance in general and innovation in particular. These facts emphasize the relevance of integrating them simultaneously into a single conceptual framework instead of fragmenting their treatment across several articles. This also has the benefit of allowing us to examine potential interaction effects between the various concepts involved, which is a major consideration that deserves more attention when analyzing the link between the BoD and innovation (Arzubiaga et al., 2018; Bendig et al., 2020; Querbach et al., 2020). In this way, it becomes possible to analyze indirect links—in this case, those between board composition (i.e., size, independence, and human capital) and board roles (i.e., control and strategy)—and to

ultimately move toward a substantial understanding of innovation antecedents regarding various facets of the BoD considered simultaneously.

Notwithstanding the importance of board composition and board roles, and even more so, the interactions between these two dimensions, board effectiveness is probably the concept with the greatest explanatory power regarding how these concepts materialize. Somewhat paradoxically, it is also one of the least studied board variables due to the difficulty in measuring it (Bonini and Lagasio, 2022; Forbes and Milliken, 1999; Payne et al., 2009). Board effectiveness takes on its full importance when it comes to innovation, given that this organizational outcome often results from complex antecedents. This means that attempting to link it to factors related to board composition and/or board roles alone would provide only a partial understanding. In this sense, board-level outputs, in the form of board tasks' outcomes as attested by directors' historical contributions, must also be considered to better assimilate the mechanisms through which the BoD can contribute to organizational performance (Boivie et al., 2021; Bonini and Lagasio, 2022). In short, if board composition and board roles are relevant, they only take on their full meaning when they lead to concrete outcomes at the board level, and only then is it appropriate to infer the idea of the potential impact of directors on organizational outcomes such as innovation.

In light of these observations, our analysis draws upon the premises of resource-based, resource dependence, agency, and contingency theories. These theories allow us to analyze the multiple facets of the BoD included in our extensive analytical framework (i.e., composition, roles, and effectiveness) and to consider the importance of the internal and external environments of organizations, both of which are fundamental for innovation (Gurtner and Reinhardt, 2016; Piening and Salge, 2015). We tested our theoretical framework and hypotheses on primary data gathered from a survey of 300 SMEs. In accordance with our desire to grant a greater place to complexity by analyzing indirect effects and adopting a sequential logic, we used structural equation modeling to drive our statistical tests.

Our study contributes to the advancement of knowledge in the fields of strategy, innovation, and entrepreneurship. The first major contribution is related to our extended theoretical development, which combines four theories. This approach made it possible to highlight the

contradictory positions that can be adopted for the same board-level concepts, which could explain the inconsistency of the results regarding the impact of the BoD on innovation. A second major contribution is the original conceptualization of certain variables (i.e., board control role, board human capital, and board effectiveness), supported not only by extensive literature but also by rigorous statistical tests. This has allowed us to propose constructs and arguments that might seem far from traditional theories like agency theory but that are definitely more in line with the reality of SMEs. The third, and perhaps most important theoretical contribution, resides in the multistage approach that we developed to dissect the complex process within the BoD, and that makes it possible to understand the path through which this governance body can influence innovation in the context of SMEs. This takes on even more meaning knowing that the thesis of the direct causal relationship continues to be favoured, causing the literature to provide only a partial understanding and a rather simplistic view of the impact of the BoD on innovation. The fourth contribution concerns contingencies to which the BoD is not impervious, and it translates into the fact that firm internationalization has been shown to be relevant in explaining innovation. This finding underlines the need to relativize the impact of the BoD, as it might also be through interactions with various environmental factors, and not only interactions within it, that the BoD can exert a significant influence on innovation in SMEs.

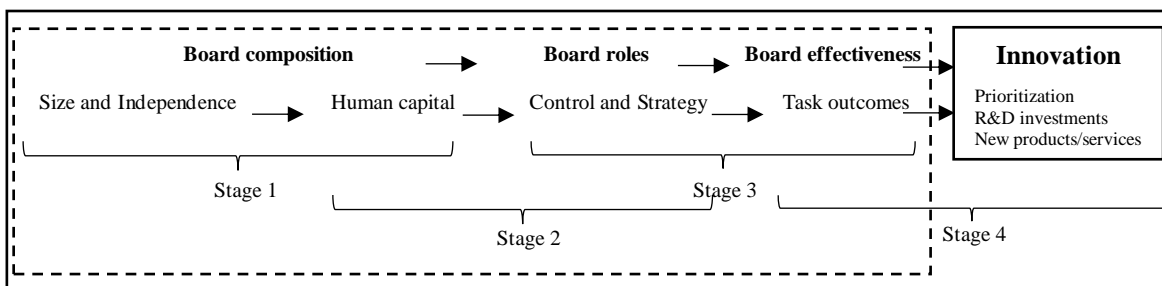
From a practical point of view, our results suggest that SMEs without a board would benefit from implementing one, as it is a mechanism that could be valuable in the quest for innovation. SMEs that have already implemented a board should prioritize the research of alternatives to increasing the number of directors in general, and that of independent directors in particular, because this does not seem to feed the human capital pool of the BoD; it is actually the opposite. This is even more necessary given that our findings show the relevance of having a high degree of human capital within the board for SMEs, and that this concept is probably the most promising vector for ensuring that directors are highly involved in their control and strategic roles. Furthermore, the fact that board members are committed to their duties would not be sufficient to increase innovation. SMEs should take appropriate measures to ensure that they have an effective way to assess the historical contributions of directors. These recommendations apply to both the recruitment of new directors and the evaluation of current board members, or in general, to pinpoint and elucidate the contributions of the BoD

in terms of organizational outcomes such as innovation. Even more broadly, our results also point to the relevance of the BoD when it comes to identifying elements that can increase the survival rate of SMEs, in this case, through its contribution to innovation.

## 2.4. Theoretical background and hypotheses development

The literature on the link between the BoD and innovation is fragmented, both theoretically and empirically. This might be partly because a simplistic view suggesting a direct linear impact of certain board characteristics on innovation continues to be favoured. We suggest a more nuanced approach by arguing that the influence of the BoD on innovation is much more complex and translates more precisely into a four-stage sequential process (Figure 5).

**Figure 5.** The multistage and sequential conceptual framework linking BoD composition, roles, and effectiveness to innovation



The first stage is reflected in the degree to which board size and independence influence the level of human capital within the BoD.

Once a board reflects a given level of human capital, it must be put to good use. This concerns the ability of the BoD to materialize its human capital by assuming its control and strategic roles, which represents the second stage of the process.

Beyond being highly involved in their roles, directors must do so adequately by demonstrating great effectiveness in performing their tasks as attested by historical contributions at the organizational level; this is the third stage of the process.

Finally, the fourth stage relates to the fact that, based on its effectiveness, the BoD will be able to exert a tangible influence on various organizational outcomes—in the case of this study, specifically on innovation.

## **2.4.1. Board composition and innovation**

### **2.4.1.1. Size and innovation**

Board size is generally smaller in SMEs and tends to fluctuate according to the size and complexity of the firm (Coles et al., 2008; Eisenberg et al., 1998; Forbes and Milliken, 1999). The optimal number of directors continues to be debated, particularly when it comes to considering this aspect in connection with innovation. On the one hand, a smaller number of directors could be preferable because as board size increases, organizations tend to engage in fewer innovation inputs (Dalziel et al., 2011; Faleye et al., 2018; Shaikh et al., 2018) and produce fewer innovation outputs (Arzubiaga et al., 2018; Lin and Chang, 2012; Zona et al., 2013). On the other hand, a larger board size could be advisable for both innovation inputs (Balsmeier et al., 2017; Driver and Colheo Guedes, 2012; He and Jiang, 2019) and outputs (He and Jiang, 2019; Kang et al., 2018; Wincent et al., 2013). Thus, the empirical results do not allow us to take a categorical position regarding the link between board size and innovation. This can in part be explained by the fact that the analysis should not be restricted to the number of directors by considering board size in light of other variables to uncover its added value (Goodstein et al., 1994; Helmers et al., 2017; Zona et al., 2013).

From a theoretical standpoint, scholars have posed arguments regarding the benefits of both large and small board sizes. Agency theory suggests that the larger a board, the more fertile ground there is for communication and coordination problems to emerge (Jensen, 1993; Lipton and Lorsh, 1992), which could inhibit innovation. Resource-based theory, however, supports the idea that a larger board size might be preferable, as it could grow and diversify skills and knowledge, and ultimately help generate a competitive advantage. It also stipulates that value—and not necessarily the number of resources—is the relevant point of consideration (Barney, 1991; Wernerfelt, 1984). Resource dependence theory takes a rather nuanced view, suggesting that the number of directors should increase as a firm's need for external links expands (Hillman et al., 2000; Hillman et al., 2009; Pfeffer and Salancik, 2003). Thus, depending on the theory used, it is possible to advocate for both a small and a large board size to stimulate innovation, which could explain the mixed empirical results.

In light of these contradictory positions, expressed both empirically and theoretically, leaning toward one or the other would not be wise. The central idea to be drawn is that the number of directors should be analyzed in relation to its added value. This can be reflected in the capacity of board size to make board human capital fluctuate. We argue that board human capital gives meaning to board size because an increase or decrease in the number of directors will inevitably affect the degree of human capital within the board. Some studies support this position and, more generally, the idea that one of the most relevant justifications for increasing board size is that it expands the degree of human capital (e.g., Khanna et al., 2014; Vandenbroucke et al., 2016). Thus, we postulated the following:

*H<sub>1</sub>: In SMEs, board size can explain innovation when it is analyzed in light of the degree of board human capital.*

#### **2.4.1.2. Independence and innovation**

Independent directors—outside directors, non-executive directors, and unrelated directors—fulfill no other roles (besides those related to directors) and have no other ties to the firms in which they serve (Balsmeier et al., 2017; Ma and Khanna, 2016; Pfeffer and Salancik, 2003). Studies examining the link between board independence and innovation have also reported mixed results. Many studies have shown that board independence leads to an increase in innovation inputs (Chen et al., 2018; Garcia Osma, 2008; Hill and Snell, 1988) and outputs (Balsmeier et al., 2017; Chen et al., 2018; Lu and Wang, 2018). However, an inverse relationship has also been established in terms of innovation inputs (Deutsch, 2007; Yoo and Sung, 2015) and outputs (Hoskisson et al., 2002; Srinivasan et al., 1996). These facts corroborate the hypothesis suggesting that when investigating the potential impact of board independence on innovation, scholars should engage in an in-depth analysis, given that several contingencies could govern this link (Sena et al., 2018; Zona, 2016).

This empirical contrast can also be observed at the theoretical level. Agency theory advocates the need to move toward a greater degree of independence so that directors can adequately perform their control functions and contribute to strategic decisions (Balsmeier et al., 2014; Hillman and Dalziel, 2003). However, the strategic perspective is more relevant than the monitoring one in the specific context of SMEs (Uhlauer et al., 2021; Voordeckers et al.,



2007). This could explain why board independence is sometimes considered less pertinent in the context of SMEs, given that independent directors are traditionally allocated a control/monitoring role (Brunninge et al., 2007; Johannisson and Huse, 2000). Resource dependence theory argues that independent directors can facilitate access to external resources needed by the firm to deal with uncertainty in its environment and to provide the organization with skills and knowledge (Dalziel et al., 2011; Hillman and Dalziel, 2003). However, these elements are not their prerogative (Kor and Sundaramurthy, 2009). Therefore, it is reasonable to defend the benefits of both inside and outside directors with regard to innovation.

In short, the literature on board independence has reached no consensus, either empirically or theoretically, especially regarding its impact on innovation. The central idea to be drawn is the need to focus on what independent directors can bring to the board and ultimately, to their firms, because having this type of board member is insufficient to explain variations in innovation. Concretely, independent directors should be analyzed through the prism of their human capital, as this can provide a clearer picture of their potential impact on organizational outcomes, such as innovation (Dalziel et al., 2011; Johnson et al., 2013; Tian et al., 2011; Zattoni et al., 2015). This reasoning leads to the following hypothesis:

*H<sub>2</sub>: In SMEs, board independence can explain innovation when it is analyzed in light of the degree of board human capital.*

#### **2.4.1.3. Human capital and innovation**

Board human capital is the sum of directors' experience, expertise, skills, and knowledge (Johnson et al., 2013; Kor and Sundaramurthy, 2009; Tasheva and Hillman, 2019). It can contribute to strategic decision making (Adams and Ferreira, 2007; Calabrò et al., 2021; Coles et al., 2008) and ultimately foster the penetration of new international markets (Chen et al., 2016) as well as organizational growth (Kor and Sundaramurthy, 2009) and involvement in innovation (Schiehll et al., 2018).

The specific experience of directors in their organization's focal industry can represent a valuable resource (Bruneel et al., 2018) and allow firms to benefit from greater legitimacy and a more extensive network, in addition to instilling trust among minority shareholders

(Kor and Misangyi, 2008; Van den Berghe and Levrau, 2004). This notion has also been associated with greater R&D expenditure intensity (Guldiken and Darendeli, 2016), along with better performance of monitoring functions (Wang et al., 2015) and strategic change (Oehmichen et al., 2017).

Directors' level of education influences radical innovation (Wincent et al., 2010), and their functional diversity has a positive impact on firm growth (Barroso-Castro et al., 2022). In addition, outside directors who have studied at prestigious universities foster R&D investment, given their high degree of human capital (Dalziel et al., 2011). The education of directors and entrepreneurs has been identified as a driver of both innovation inputs (Chen, 2014; Marvel and Lumpkin, 2007) and outputs (He and Jiang, 2019; Wincent et al., 2013).

Seniority, often defined by board tenure and directors' experience, is also relevant to the decision-making process and the relationship between the BoD and management (Kosnik, 1990). This concept also captures the extent to which directors better protect shareholder interests (Sharma, 2011) and is associated with higher attendance at board meetings (Vafeas, 2003) and innovation outputs as measured by patents (Vandenbroucke et al., 2016).

The elements presented above are only a few of the many concrete examples of the benefits linked to different facets of board human capital. They also point to why the experience, skills, and knowledge of directors are important for innovation (Balsmeier et al., 2014; Tzabbar and Margolis, 2017). By the same token, they explain why it is fundamental to expand the analysis by considering the pool of human capital within the BoD in addition to variables such as board size and independence (Bravo and Reguera-Alvarado, 2017; Hillman et al., 2009; Kor and Sundaramurthy, 2009). Notably, board size and independence are not sufficient indicators of directors' ability to fulfill their roles, as they could differ significantly depending on the context (Boivie et al., 2021; Hillman et al., 2000; Hillman and Dalziel, 2003). Accordingly, by exploiting their human capital, directors would be in a better position to fulfill their control and strategic roles (Arzubiaga et al., 2018; Forbes and Milliken, 1999; Hillman and Dalziel, 2003; Haynes and Hillman, 2010; Heyden et al., 2015).

In light of all these aspects, there is a clear consensus regarding the positive nature of board human capital. This is also a reality from a theoretical point of view: no theory could

rationally lead to the prediction of a negative link between board human capital and innovation. Resource dependence theory suggests that directors must contribute to their organization by providing advice and increasing legitimacy (Pfeffer and Salancik, 2003), and board human capital can only contribute to these aspects. Resource-based theory emphasizes the importance of resource heterogeneity (Barney, 1991; Wernerfelt, 1984), which could be reflected in the various skills and knowledge of the directors. Agency theory emphasizes the potential problems of information asymmetry and opportunistic behaviours between principals and agents (Fama and Jensen, 1983; Jensen and Meckling, 1976) that human capital can help alleviate.

In summary, the arguments put forward regarding the potential impact of board human capital on innovation lead to three main observations. First, board human capital is a central concept that explains the potential contributions of directors, especially when it comes to innovation. Second, board human capital helps make sense of the relevance of board size and independence for innovation purposes. Third, board human capital nurtures the capacity of directors to fulfill their control and strategic roles. In this sense, there is little doubt that board human capital is critical to innovation, but in line with our concern for nuance, we must emphasize that human capital, when analyzed through the prism of diversity, is not a guarantee of positive and direct organizational outcomes (El Shoubaki et al., 2020; Guldiken et al., 2019; Zhu and Shen, 2016). These considerations lead to the following hypothesis:

*H<sub>3</sub>: In SMEs, board human capital acts as an intermediary between board size and independence on the one hand, and board control and strategic role on the other, to explain innovation.*

## **2.4.2. Board roles and innovation**

### **2.4.2.1. Control and innovation**

BoD' control role is often linked to its independence, mainly because independent directors are independent not only from the firm and other directors (Hillman et al., 2008), but also from the CEO (Boyd, 1995; Hermalin and Weisbach, 1998; Johnson et al., 1996). The control role has also been represented by incentives for directors to motivate them to perform this role rigorously (Jensen, 1993), generally given out as compensation in the form of shares.

This incentive principle has also been addressed exclusively in connection with the CEO rather than the BoD as a whole. Furthermore, CEO duality, when it includes monetary incentives, has been identified as a potential solution to the convergence of the interests of shareholders and executives (Conyon and Peck, 1998; Donaldson and Davis, 1991).

BoD' control role offers limited scope in terms of organizational performance, as it ignores most board attributes (Barroso-Castro et al., 2011). Its relevance can mainly be established based on its primary constraining character in terms of innovation. The uncertainty inherent in innovative initiatives (Hoskisson et al., 1993; Pang and Wang, 2020) and risk aversion, which, by definition, characterizes directors to protect the interests of shareholders, induces the need for greater control (Eisenhardt, 1989; Fama and Jensen, 1983; Jensen and Meckling, 1976). This relates to short-termism, which supports the hypothesis that boards' control role has a negative influence on innovation.

However, a more positive view can also be taken: BoD' control role could enable more thoughtful selection of innovation projects. The management of problems between principals and agents could also result in the firm being operated more efficiently and performing better (Filatotchev et al., 2020), particularly in terms of innovation. Thus, although agency problems and the related control role suggest a position that is *a priori* hostile to innovation, a nuanced view could be considered. This is supported by the fact that BoD' control role has been reported to affect the implementation of strategies (Rindova, 1999) and organizational performance (Hillman and Dalziel, 2003).

Since BoD' control role can potentially be both beneficial and detrimental to innovation, the presence of certain nuances between the governance of SMEs and that of large firms (Forbes and Milliken, 1999; Uhlaner et al., 2007) becomes an interesting element that can push the reasoning a step further. First, the role of managers and shareholders may have greater significance for SMEs, given the scarcity and difficult access to resources they have to deal with, which are major issues that must be addressed to innovate (Colclough et al., 2019). Moreover, the entire business philosophy can differ considerably between SMEs and large corporations. Shareholders in large corporations typically have the main goal of maximizing the return on their investments. In the case of SMEs, as shareholders often consist almost exclusively of the founder-manager and their relatives, the approach tends to be much more

altruistic (Arzubiaga et al., 2018; Rasmussen et al., 2018; Van den Heuvel et al., 2006). Also, in SMEs, the goal of recruiting independent directors is to gather a variety of perspectives (Minichilli et al., 2009) and support the founder (Zahra and Filatotchev, 2004), rather than to monitor the CEO as is traditionally the case in large firms (Kang and Zaheer, 2018; Wang et al., 2019).

In the same vein, agency problems may be almost non-existent in the context of SMEs (Bammens et al., 2011; Gnan et al., 2015; Zahra and Filatotchev, 2004). Information tends to circulate in a more transparent manner (Gnan et al., 2015), and control is generally focused on the CEO or, more broadly, on the family (De Massis et al., 2016), as SMEs are generally averse to the idea of relinquishing a share of ownership (Gómez-Mejía et al., 2007). SMEs' governance is therefore generally less formal, so norms in terms of relationships and trust are all the more essential (Calabrò and Mussolino, 2013). The principles linked to agency theory, such as opportunistic behaviours associated with managers of large firms, which tend to hide or bias certain information (Hoskisson et al., 1994), do not usually represent an issue in the context of SMEs because the concentration of shareholding mitigates these potential problems (Dasilas and Papasyriopoulos, 2015). All these elements suggest that BoD' control role is probably non-existent in the context of SMEs, or at least not formalized, and is mainly reflected in the concentration of (decision-making and/or ownership) power. These arguments lead to the following hypothesis:

*H4: In SMEs, BoD' control role does not act as an intermediary between board human capital and board effectiveness in explaining innovation.*

#### **2.4.2.2. Strategy and innovation**

BoD' strategic role appears to be more relevant than the control role in explaining innovation, especially in SMEs (Van den Heuvel et al., 2006), as potential control tasks are linked to strategic processes (Arzubiaga et al., 2018). Furthermore, the capacity of the board to fulfill its roles largely depends on its composition (Bernile et al., 2018; Pearce and Zahra, 1992). In defining this role, it is essential to attenuate the confusion associated with it, which is fuelled largely by the literature. Some scholars define it as a strategic role (Pearce and Zahra, 1992; Ruigrok et al., 2006; Zahra and Pearce, 1989), whereas others speak of a role in connection

with access to resources (Barroso-Castro et al., 2011; Hillman et al., 2000; Johnson et al., 1996). Other terms include “service role” (Bjornali et al., 2016; Crucke and Knockaert 2016; Zattoni et al., 2017) and “advisory role” (Adams et al., 2010; De Andres and Vallelado, 2008; Minichilli and Hansen, 2007).

The entanglement illustrated above is exacerbated by the fact that several of these roles are split and/or juxtaposed. For example, Johnson et al. (1996) argued that the service role is reflected in the fact that directors should provide advice to the CEO, but they also include a strategic component consisting of the board’s involvement in decision making. Thus, the service role refers as much to “service” tasks as it does to “advice” and “strategy” tasks. According to these same authors, the third role (i.e., in addition to those of control and service/advice/strategy) is linked to resource dependence, which considers the board an instrument for organizations to facilitate access to resources and help them deal with their external environment more effectively. For other scholars, however, the service role itself includes a resource dependence role, whereas the strategic role is distinct (Pearce and Zahra, 1989). These different ways of operationalizing board roles explain much of the controversy that persists in the definition of BoD’ strategic role in particular (Zahra and Pearce, 1989; Pugliese et al., 2009; Zattoni et al., 2015) and all boards’ roles in general (Barroso-Castro et al., 2011; Machold and Farquhar, 2013; van den Heuvel et al., 2006). A literature review of 150 articles demonstrates this by reporting a high degree of variability in the definition of “BoD’ strategic role” (Pugliese et al., 2009).

A more appropriate approach may be to combine all these roles (i.e., advisory, service, strategy, and resource) into a single role. The most extensive review of the literature on board strategic roles suggested grouping all these roles under the term “strategic involvement of the BoD” (Pugliese et al., 2009). Moreover, the choice not to separate the “strategy” role from the “resource” role is supported by the literature—they are interchangeable and could even overlap with the service/advisory role (Knockaert and Ucbasaran, 2013). Other studies agree that the board fulfills two main roles that fall under the “strategy” and “control” categories (Arzubiaga et al., 2018; Baldenius et al., 2014; Harjoto et al., 2015; Zhu et al., 2016). Finally, the lack of a clear definition and indisputable measures regarding board roles (Nicholson and Newton, 2010) further justifies an approach that combines apparently similar roles.

BoD' contributions in terms of strategic decisions have been documented extensively (Pearce and Zahra, 1992; O'Neal and Thomas, 1996; Rindova, 1999). More recently, their importance in terms of innovation has been underlined (Arzubiaga et al., 2018; Bendig et al., 2020; Zona et al., 2013). BoD' strategic role translates into directors' involvement in initiating, formulating, and implementing strategies, participating in different phases of the strategic process, and influencing various organizational outcomes (Judge and Zeithaml, 1992; Machold et al., 2011; Pugliese et al., 2009). These elements suggest that a BoD is particularly useful for firms when it deploys its "strategic arsenal." Given that innovation is a strategic imperative (Pisano, 2015; Stringer, 2000), the strategic role of the board contains, by definition, great potential for understanding the impact of directors on innovation.

BoD' strategic role also allows us to consider the contribution of directors to the acquisition of both internal and external resources. Regarding internal resources, following the logic of resource-based theory (Barney, 1991; Wernerfelt, 1984), directors can serve as strategic resources with their various skills and knowledge (Barroso-Castro et al., 2011; Bommaraju et al., 2019). Regarding external resources, to which resource dependence theory refers (Hillman et al., 2000; Pfeffer and Salancik, 2003), a board's strategic role could help fulfill organizations' resources needs and mitigate its dependence on its external environment (Hillman et al., 2009; Pfeffer and Salancik, 2003). BoD' strategic role could thus influence innovation not simply through the involvement of directors in the decision-making process, but also through their tasks in terms of acquisition and allocation of both internal and external resources.

It is now necessary to put the board strategic role into perspective in the context of SMEs. One of the main characteristics of SMEs that distinguishes them from large firms is that they can change their strategies more quickly, given the concentration of control that prevails in such firms (Patel and Chrisman, 2014). However, strategy change is less frequent in SMEs as they tend to perpetuate the strategy established at the firm's creation (Brunninge et al., 2007). Most SMEs also have simple systems and procedures, which gives them more flexibility and allows them to make decisions faster (Singh et al., 2008). In this regard, strategy formulation is often implicit (Hagen et al., 2012), and given that SMEs often do not usually have the resources to commit to R&D investments, they rely in part on knowledge

acquisition to innovate (Hervas-Oliver et al., 2014). Also, despite the prevailing notion that CEOs of SMEs are the main decision makers, they are often supported by other members of the governance chain (Van Gils, 2005). These elements suggest the importance of BoD' strategic role for large firms and SMEs, particularly in terms of innovation. In this sense, this suggest that strategy might be more sensitive to aspects such as sectoral specificities (Freel, 2000) rather than organizational size. Overall, based on the arguments above, we hypothesize the following:

*H<sub>5</sub>: In SMEs, BoD' strategic role acts as an intermediary between board human capital and board effectiveness in explaining innovation.*

### **2.4.3. Board effectiveness and innovation**

BoD' effectiveness is undoubtedly the most crucial aspect in elucidating the potential contributions of this governance body to organizational outcomes. It is also one of the least studied concepts in the corporate governance literature, notably because of the difficulty in observing the effectiveness of directors in practice (Cheng et al., 2022; Forbes and Milliken, 1999). Thus, much emphasis has been placed on board composition and roles, but these concepts only have actual value insofar as they allow directors to be effective in their various tasks and enhance organizational effectiveness (Khanna et al., 2014; Provan, 1980; Lorca et al., 2011). Thus, board effectiveness is usually operationalized mainly by considering the two traditional roles of control and strategy assigned to directors (Wang et al., 2019; Zattoni et al., 2015; Zona and Zattoni, 2007). Forbes and Milliken's (1999) model serves as a reference and has inspired the approach of most of the few studies that have examined this dimension of the BoD. The general idea of this model is that board composition, through certain board processes (e.g., effort norms, cognitive conflicts, and use of skills/knowledge), affects board effectiveness (e.g., task performance and cohesiveness), and ultimately allows the BoD to have an impact on firm performance. In contrast, we highlight three major distinctions.

First, we consider that board processes are transversal to all board components and cannot be considered mediators between board composition and board effectiveness. Indeed, processes linked to the recruitment or renewal of directors precedes board composition. At the other end of the continuum, after the board has completed its duties, there may be an evaluation



process. Our argument is supported by the fact that the transversal character of various processes has been supported in different ways, for example, through specific processes related to the logistics and practices of board meetings or the exchange of information (Bradshaw et al., 1992; Cornforth, 2001; Milliken and Vollrath, 1991; McNulty and Pettigrew, 1999). Moreover, SMEs' context involves certain processes, such as those related to succession (Querbach et al., 2020; Umans et al., 2020).

Second, the purpose of the BoD, through its control and strategic roles, is to contribute to firm performance. Directors should not only be intensely involved in their duties, but should do so in an effective manner. High involvement does not guarantee effectiveness, although it certainly represents an important step toward this end. The idea here is that quantity (involvement) is not synonymous with quality (outcomes). Thus, it seems preferable to look at the concrete historical contributions of the BoD at the organizational level to assess its effectiveness (Payne et al., 2009; Veltrop et al., 2015) and not limit it to a high degree of involvement.

Third, the concept of cohesiveness is challenging to consider as a dimension of board effectiveness. Directors are generally very busy individuals (Elyasiani and Zhang, 2015; Field et al., 2013; Hauser, 2018) who sit on several boards (Bravo and Reguera-Alvarado, 2017; Brown et al., 2019). They could certainly benefit from a wider network, but it might result in lowering their participation on each board (Hillman et al., 2008; Masulis and Zhang, 2019). Also, directors meet punctually, which means that it is often difficult to have the necessary bases to produce a rational analysis of board cohesiveness and, more specifically, to consider it as a dimension of board effectiveness or as an antecedent of innovation. Thus, we believe that board task outcomes, which refers to directors' historical contributions, is sufficient to capture board effectiveness and implicitly considers board cohesiveness.

This discussion produces three major observations. First, even if board effectiveness is one of the least studied board-level concepts, owing in part to the difficulty of measuring it, it may be the most important variable for understanding the potential impact of directors on organizational outcomes. Second, board effectiveness is mainly a consequence of directors' task performance and their inherent processes, which we know very little about today and

which are transversal to all board components (i.e., board composition, roles, and effectiveness). Third, board effectiveness could be beneficial to innovation because it consists of a testimony of the concrete historical contributions of directors, which puts them in a good position to impact such a specific and complex organizational outcome. In this regard, it is instructive to note, for example, that the BoD has been reported to contribute to firms' financial performance and/or identification of new business opportunities (Bonini et al., 2021; Dalton et al., 1999; Zahra and Pearce, 1989), which have been linked to innovation (De Jong et al., 2013; Parmar et al., 2014; Zahra, 1996).

*H<sub>6</sub>: In SMEs, BoD' effectiveness acts as an intermediary between board roles (control and strategic) and innovation.*

## **2.5. Methodology**

### **2.5.1. Sampling**

This empirical study of the link between the BoD and innovation is based on SMEs, which are defined as firms with fewer than 250 employees (Arzubiaga et al., 2018; Querbach et al., 2020; Statistics Canada, 2020). SMEs with fewer than 20 employees were not considered, given the low likelihood that they had implemented a formal governance mechanism, such as a BoD. Given that geography is an important aspect of governance and performance (Zahra and Pearce, 1989; Zattoni et al., 2017), we conducted the survey in a specific Canadian province (Québec). This approach has the advantage of neutralizing potential contextual biases and is all the more relevant given the differences between Canadian provinces (Bédard et al., 2008; Dicko et al., 2020; Switzer and Kelly, 2006). This choice is also justified by the fact that institutional particularities represent an important factor in governance (Forbes and Miliken, 1999; Li, 2019) and it contributes to the need to diversify the literature in terms of geographic context (Huse, 2000; Boyd et al., 2017; Pugliese and Wenstøp, 2007).

We contracted a polling firm to conduct a telephone survey from June 4 to July 7, 2020, according to the need to conduct research based on primary data rather than secondary data when studying corporate governance (Boyd et al., 2017; Filatotchev and Wright, 2017; McNulty et al., 2013). The survey reached 1,933 firms and ultimately 487 observations were collected (response rate: 25%). 300 responses were fully usable, and 112 (37%) of these

SMEs had a BoD. This sample size is consistent with the literature on corporate governance (Arzubiaga et al., 2018; Hoskisson et al., 2002; Querbach et al., 2020; Robeson and O'Connor, 2013; Zahra et al., 2000). To strengthen the rigour of the empirical approach, we implemented the necessary steps to avoid possible biases, such as those related to the use of a single instrument (i.e., questionnaire) or a single respondent (i.e., the SMEs' main executive), to measure the independent and dependent variables (Arzubiaga et al., 2018; Minichilli et al., 2009; Zona et al., 2013).

## **2.5.2. Variables**

The latent variables were assessed on a five-point Likert scale (1 = strongly disagree and 5 = strongly agree) and were obtained by averaging all the items related to each of them.

### **2.5.2.1. Independent/mediating variables for board composition**

We measured *board size* by the total number of directors on the board (Bendig et al., 2020; Cheng, 2008), *board independence* by the percentage of independent directors (Lu and Wang, 2018; Zona, 2016), and *board human capital* as a construct that accounted for various underlying aspects, especially board expertise and tenure (Johnson et al., 2013; Kor and Sundaramurthy, 2009; Tasheva and Hillman, 2019). The latter is an attractive alternative approach for considering each construct individually (Arzubiaga et al., 2018; Zona et al., 2013), especially since the distinction between different sub-components could partly explain the mixed results produced on aspects such as specific expertise or level of education. Board human capital was more specifically represented by four items: the degree to which directors had extensive (1) experience as directors, (2) managerial experience, (3) knowledge of their firm's industry, and (4) knowledge of the main corporate functions of their organization. The results showed an eigenvalue of 2.18. The Cronbach's alpha for this index was 0.75.

### **2.5.2.2. Independent/mediating variables for board roles**

We measured the *board control role* using an index that included four items articulated around the specificities of SMEs in terms of power concentration. This translates into the combination of the following facts: (1) the CEO is also the chairman of the board, (2) the main owner sits on the board, (3) the CEO is also the main owner, and (4) the organization is a family firm. Traditional notions of control, compensation, and performance evaluation

of senior executives (Johnson et al., 1996; Pearce and Zahra, 1992; Zattoni et al., 2015) were not considered for three main reasons. First, these characteristics are inspired by the reality of large corporations, in which ownership and management are usually dissociated (Forbes and Milliken, 1999). Second, although these elements were included in the questionnaire to assess their relevance, the exploratory factor analysis resulted in their exclusion, which in turn supports the first argument. Third, agency problems are considerably reduced (if not absent) in SMEs (Gnan et al., 2015), which demonstrates the low utility of aspects associated with the traditional role of control and suggests that they are more strategic in nature for SMEs (Arzubiaga et al., 2018). The results showed an eigenvalue of 2.35. The Cronbach's alpha for this index was 0.75.

We measured *board strategic role* by considering the purely strategic contributions as well as those in terms of advice, services, and resources. Thus, the index consisted of a combination of the different ways of operationalizing this role described in the literature, which is similar among SMEs and large corporations (Forbes and Milliken, 1999; Garg and Eisenhardt, 2017; Johnson et al., 1996; Pearce and Zahra, 1992; Pugliese et al., 2009; Ravasi and Zattoni, 2006; Ruigrok et al., 2006; Zahra and Pearce, 1989). Specifically, board strategic role was measured by assessing the extent to which the board was involved in (1) strategic planning; (2) monitoring, control, and approval of budgets; (3) risk management; (4) performance and compensation of senior executives; and (5) management of the crisis related to the COVID-19 pandemic. The results showed an eigenvalue of 2.77 and a Cronbach's alpha of 0.78.

### **2.5.2.3. Independent/mediating variable for board effectiveness**

We measured *board effectiveness* with consideration for the need to adopt a broad view (Payne et al., 2009). We used eight items on the extent to which the BoD has historically contributed to firms: (1) access to new business opportunities, (2) growth, (3) reputation, (4) strategic planning, (5) financial performance, (6) social performance, (7) innovation, and (8) management of the COVID-19 pandemic. The results yielded an eigenvalue of 3.71 and a Cronbach's alpha of 0.83.

#### 2.5.2.4. Control variables

A study on the link between governance and innovation must incorporate control variables, as elements related to the environment have a share of importance (Arzubiaga et al., 2018; Filatotchev et al., 2020; Zona et al., 2013). In this regard, we considered several control variables for analysis at both the board and firm levels.

We measured *firm size*, which has been both positively (Balsmeier et al., 2017; Camisón-Zornoza et al., 2004; Damanpour, 1992) and negatively (Chandy and Tellis, 2000; Faleye and Hoitash, 2011; Wu and Wu, 2014) related to innovation, by the total number of employees. This is the only variable that required a logarithmic transformation to respect the premise of normality.

*Firm age*, meaning the total number of years since the firm's inception, was also considered for control purposes. This variable can also both increase (Faleye et al., 2018; Matzler et al., 2015; Zona, 2016) and decrease (Dalziel et al., 2011; Sena et al., 2018; Yoo and Sung, 2015) innovation.

Innovation requires a culture and a climate that favors it (Damanpour, 1991; Deschamps and Nelson, 2014). In this regard, certain sectors distinguish themselves by their culture of innovation (Daziel et al., 2011; Heyden et al., 2015). These observations point to the need to control for possible sectoral effects (Arzubiaga et al., 2018; De Massis et al., 2018; Zona et al., 2013). Thus, our study used *firm sector* as a control variable based on the OECD classification of technology intensity. To optimize the factorial model and considering the relatively small sample size, we adapted this classification to form a binary variable. We merged the “high technology intensity” and “medium-high technology intensity” classifications to form the “technology-prone” classification (1). The same approach was used for the “low technology intensity” and “medium-low technology intensity” classifications to form the “technology-averse” classification (0) (Gimenez-Fernandez et al., 2020; Link and van Hasselt, 2020).

We measured *firm financial performance* using a binary variable that distinguished firms that outperformed (1) from those that underperformed (0) their main competitors. This variable

is relevant because it can affect both innovation inputs (Chen et al., 2016, 2018; Matzler et al., 2015) and outputs (Balsmeier et al., 2014; Zahra, 1996; Zahra et al., 2000).

*Firm internationalization* is also relevant considering its potential effects on both innovation inputs (Horbach and Jacob, 2017) and outputs (Wu and Wu, 2014). We used a binary variable to distinguish firms that produced internationally and/or engaged in foreign sales (1) from those that only do business locally.

#### **2.5.2.5. Dependent variable**

We measured *innovation* using three items that captures specifically *internal product/service innovation*. This construct was inspired by previous studies that focused on innovation in a broad sense and internal innovation in particular, that is, innovation that combines R&D and product/service innovation (Bianchi et al., 2016; Hitt et al., 1996; Hoskisson et al., 2002; Zona et al., 2013). The first item gauged firms' innovation efforts by assessing the degree to which innovation was considered a priority objective, which is an important element regarding both R&D intensity and new product development (Eliëns et al., 2018; Garms and Engelen, 2019). The second item concerned innovation inputs, represented by the amount of R&D expenditure by SMEs compared with their main competitors. Apart from facilitating organizational learning (Cohen and Levinthal, 1990), R&D exerts the highest marginal impact on the development of major innovations for SMEs (Baumann and Kritikos, 2016; Raymond and St-Pierre, 2010). The third item focused on the degree to which SMEs introduced new products/services compared with their main competitors. The close link between R&D and innovation outputs (Mazzola et al., 2016; Srinivasan et al., 2018; Wu and Wu, 2014) further justifies the inclusion of this variable. Although innovation is often associated with R&D departments, it is certainly not limited to this (Oslo Manual, 2018, p. 87). Indeed, R&D investments do not guarantee innovation (Scoresby et al., 2021; Zahra, 1996; Zona et al., 2013) and are a risky financial endeavour, because despite the huge amounts invested, few projects reach the market stage (Chiesa and Frattini, 2011; DiMasi et al., 2016). Furthermore, the focus on the introduction of new products and/or services (Katila and Ajuha, 2002; Querbach et al., 2020; Srinivasan et al., 2018) is justified by previous research that underlined the relevance of including both inputs and outputs in the analysis when studying innovation as a dependent variable (Protogerou et al., 2017; Rodríguez and

Nieto, 2016). The introduction of a comparative basis, which involves looking at the degree of R&D spending and the introduction of new products/services by SMEs compared with their main competitors (Bernard et al., 2020; Coad, 2019), is relevant given that innovation is essential for organizations for its ability to generate a competitive advantage (Bendig et al., 2020; Lengnick-Hall, 1992; Wu, 2008). The results showed an eigenvalue of 1.80 and a Cronbach's alpha of 0.72.

### **2.5.3. Data and factorial model validation**

To assess the quality of the data, we split the sample into two sub-samples to compare the responses collected first with those collected last. We also compared the responses for certain board characteristics (e.g., size and independence) and organizational variables (e.g., size and age). The mean tests carried out did not produce any significant results, indicating the homogeneity of the sample—a good basis to push the statistical analysis further.

After confirming the reliability and consistency of the multi-item data for all our variables, we tested the relevant assumptions before conducting the structural equations models. The choice of structural equation modeling was justified by two main reasons: the presence of latent variables and the consideration of indirect effects through mediating variables. We tested multicollinearity using multiple linear regression and assessed it through the variation inflation factor values, which ranged from 1.08 to 1.42 (Tranekjer and Knudsen, 2012; Zhang et al., 2018). We also verified normality through Q-Q plot, which revealed the need to apply a logarithmic transformation for the variable “firm size”, and homoscedasticity through the scatter plot of the residuals. The number of observations (112) and variables were consistent with recommendations specifying a sample size of 100 to 200 observations (Boomsma, 1985) or that a minimum of 5 to 10 observations per explanatory variable should be targeted (Bentler and Chou, 1987). Finally, we addressed potential common method bias using Harman's single factor test (Arzubiaga et al., 2018; Podsakoff et al., 2003; Querbach et al., 2020). This procedure revealed that one factor explained only 14.97% of the variance, far below the critical threshold of 50%, thereby confirming the absence of common method bias.

Next, we conducted confirmatory factor analysis to validate the measures of the four latent constructs: those relating to board human capital, board control role, board strategic role, and internal product/service innovation. We tested discriminant validity by ensuring that the square root of the average variance extracted was higher than the correlations between the constructs. Arriving at these results took many iterations and a long purification process that required the deletion of items, as illustrated by the differences between the constructs formed in the exploratory factor analysis and the final constructs that emerged from the confirmatory factor analysis. Overall, these numbers were all within the acceptable range at all stages, albeit not optimal at stage 1 (Fornell and Larcker, 1981; Marsh et al., 2004), and were consistent with previous research on boards published in leading journals (e.g., Uhlaner et al., 2021; Zattoni et al., 2015). Tables 10 and 11 present the variable descriptions, the results of the confirmatory factor analysis, and the measurement validity of the latent variables.

**Table 10.** Fit of the factorial models

<b>Models</b> \ <b>Metrics</b>	$\chi^2/df$	<i>p-value</i>	<i>GFI</i>	<i>NFI</i>	<i>CFI</i>	<i>SRMR</i>	<i>RMSEA</i>
<b>Model 1 (Stage 1)</b>	2.25	0.02	0.96	0.88	0.92	0.08	0.06
<b>Model 2 (Stage 2)</b>	1.46	0.06	0.93	0.90	0.96	0.05	0.06
<b>Model 3 (Stage 3)</b>	1.30	0.10	0.92	0.89	0.97	0.05	0.05
<b>Model 4 (Stage 4)</b>	1.48	0.08	0.94	0.90	0.96	0.08	0.07



**Table 11.** Variable descriptions, confirmatory factor analysis, and measurement validity

<b>Variables</b>	<b>Items</b>	<b>Loadings</b>	<b>AVE</b>	<b>CR</b>
<u><i>BoD composition</i></u>				
<i>BoD size</i>	Total number of directors	-	-	-
<i>BoD independence</i>	Percentage of independent directors	-	-	-
<i>BoD human capital</i>	The degree to which directors have extensive:	S1 / S2	S1 / S2	S1 / S2
	(1) Experience as directors	0.74 / 0.80	0.51 / 0.54	0.76 / 0.78
	(2) Managerial experience	0.73 / 0.71		
	(3) Knowledge of their firm's industry	0.67 / 0.69		
<u><i>BoD roles</i></u>				
<i>BoD control role</i>	Presence of the following dualities:	S2 / S3	S2 / S3	S2 / S3
	(1) CEO is also the chair of the board	0.58 / 0.59	0.56 / 0.55	0.79 / 0.78
	(2) CEO is also the main owner	0.83 / 0.82		
	(3) Main owner sits on the board	0.80 / 0.80		
<i>BoD strategic role</i>	The extent to which the BoD is involved in:	S2 / S3	S2 / S3	S2 / S3
	(1) Strategic planning	0.80 / 0.88	0.54 / 0.54	0.77 / 0.77
	(2) Risk management	0.72 / 0.69		
	(3) Evaluation and allocation of budgets	0.67 / 0.60		
<i>BoD effectiveness</i>	The extent to which BoD has historically contributed to its firm's:	S3 / S4	S3 / S4	S3 / S4
	(1) Search for new business opportunities	0.63 / 0.65	0.51 / 0.50	0.78 / 0.77
	(2) Growth	0.70 / 0.72		
	(3) Strategic planning	0.75 / 0.73		
	(4) Financial health	0.72 / 0.71		
	(5) Management of the COVID-19 pandemic	0.69 / 0.73		
<u><i>Organizational factors</i></u>				
<i>Financial performance</i>	The firm performs better financially than its main competitors (binary)	-	-	-
<i>Internationalization</i>	The firm produces abroad and/or makes foreign sales (binary)	-	-	-
<i>Firm sector</i>	The firm does business in a technology-prone industry (binary)	-	-	-
<i>Firm size</i>	The natural logarithm of the total number of employees	-	-	-
<i>Firm age</i>	The number of years the firm has existed since its establishment	-	-	-
<u><i>Innovation</i></u>	Innovation was measured according to the degree to which SMEs:	S4	S4	S4
<i>Internal product/service</i>	(1) Consider innovation a primary objective	0.58	0.51	0.75
	(2) Invest in R&D compared to their main competitors	0.80		
	(3) Introduce products/services compared to their main competitors	0.74		

## 2.6. Results

### 2.6.1. Descriptive statistics

The descriptive overview of our sample is presented in terms of statistics and frequency in Tables 12 and 13 (continuous and nominal variables), respectively.

Table 14 presents the correlation matrix. We used Spearman's test, given the presence of nominal variables. We notably observe that board human capital, strategic role, and effectiveness showed positive correlations with internal product/service innovation.

**Table 12.** Descriptive statistics (continuous variables)

<b>Variables</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
<i>BoD size</i>	112	5.54	3.09	1.00	19.00
<i>BoD independence</i>	112	0.21	0.34	0.00	1.00
<i>BoD human capital</i>	112	4.21	0.76	2.00	5.00
<i>BoD control role</i>	112	0.73	0.36	0.00	1.00
<i>BoD strategic role</i>	112	4.15	0.83	1.67	5.00
<i>BoD effectiveness</i>	112	3.78	0.81	1.00	5.00
<i>Firm age</i>	112	40.46	22.07	5.00	130.00
<i>Firm size</i>	112	3.90	0.71	3.00	5.52
<i>Innovation (internal product/service)</i>	112	3.42	0.87	1.00	5.00

**Table 13.** Descriptive statistics (nominal variables)

Variables/Labels		Frequency	Percentage
<i>Firm financial performance</i>	Lower than main competitors	25	22.30
	Higher than main competitors	87	77.70
	Total	112	100.00
<i>Firm internationalization</i>	Produces and/or sells only locally	82	73.20
	Produces and/or sells abroad	30	26.80
	Total	112	100.00
<i>Firm sector</i>	Technology-averse industry	83	25.90
	Technology-prone industry	29	74.10
	Total	112	100.00

**Table 14.** Correlation matrix (Spearman)

	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	0.37**	1									
3	-0.26**	-0.21*	1								
4	-0.42**	-0.37**	0.23*	1							
5	-0.30**	-0.27**	0.44**	0.26**	1						
6	-0.22*	-0.18	0.41**	0.23*	0.47**	1					
7	0.11	-0.09	-0.14	-0.33**	-0.12	-0.06	1				
8	0.12	0.00	-0.14	-0.20*	0.06	-0.05	0.26**	1			
9	-0.04	0.16	-0.10	-0.08	-0.08	-0.04	0.07	-0.01	1		
10	-0.03	0.09	-0.10	-0.10	0.00	0.09	0.03	0.03	0.06	1	
11	0.01	0.13	0.01	0.14	-0.09	-0.03	-0.08	0.05	0.01	-0.02	1
12	0.00	-0.16	0.20*	0.19	0.24*	0.25**	-0.05	0.02	0.06	0.04	0.17

**Significance** (two-tailed): \* P < 0.05; \*\* P < 0.01.

**Board variables:** 1. Size; 2. Independence; 3. Human capital; 4. Control role; 5. Strategic role; 6. Effectiveness

**Organizational variables:** 7. Age; 8. Size; 9. Sector; 10. Financial performance; 11. Internationalization

**Innovation variable:** 12. Internal product/service

### 2.6.2. Hypothesis testing

*Stage 1:* Board size ( $\beta = 0.06$ ;  $p = 0.02$ ) and board independence ( $\beta = 0.57$ ;  $p = 0.03$ ) proved to be significant factors in explaining board human capital through a negative impact. Thus, Hypotheses 1 and 2 are supported.

*Stage 2:* Board human capital yielded a significant result regarding its positive impact on both board control ( $\beta = 0.16$ ;  $p < 0.01$ ) and strategic ( $\beta = 0.61$ ;  $p < 0.01$ ) roles. Thus, Hypothesis 3 is supported.

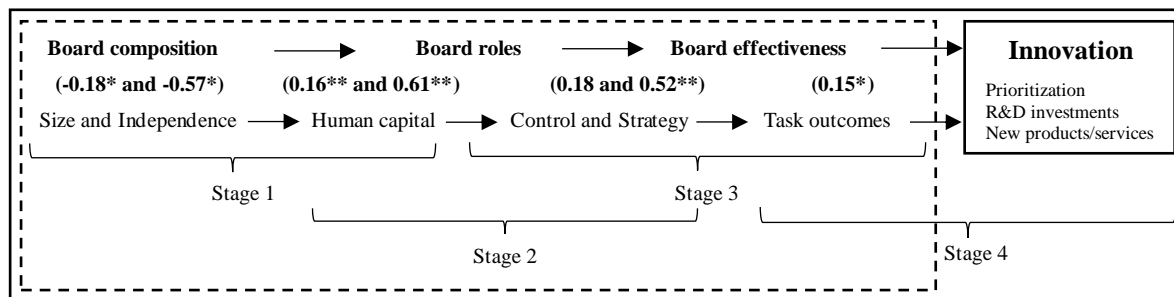
*Stage 3:* Board control role ( $\beta = 0.18$ ;  $p = 0.39$ ) did not act as a significant predictor of board effectiveness, contrary to board strategic role, which testifies to a positive link ( $\beta = 0.52$ ;  $p < 0.001$ ). Thus, Hypotheses 4 and 5 are supported.

*Stage 4:* Board effectiveness had a positive and significant impact on internal product/service innovation ( $\beta = 0.15$ ;  $p = 0.04$ ). Thus, Hypothesis 6 is supported.

Internationalization is the only organizational variable that proved to be significant in explaining product/service innovation, through a positive impact ( $\beta = 0.19$ ;  $p = 0.04$ ).

Figure 6 again shows our multistage and sequential conceptual framework, but this time by also including the results of the structural equation models.

**Figure 6.** The multistage and sequential conceptual framework linking BoD composition, roles, and effectiveness to innovation including the results of the structural equation models



$N = 112$

Maximum likelihood method

Standardized estimates (in parentheses)

\*; \*\* denote significance at the 5% and 1% thresholds, respectively

## **2.7. Discussion and conclusion**

### **2.7.1. Multistage theorization of the board's impact on innovation**

Corporate governance literature is dominated by studies on large firms, but the context of SMEs has proven to be just as, if not more, fertile ground for research (Arzubiaga et al., 2018; Gnan et al., 2015; Li et al., 2020). Studies that specifically address the impact of the BoD on innovation remain scarce, especially in the context of SMEs, and the few contributions on this topic show mixed results (Balsmeier et al., 2017; Cumming and Leung, 2021; Matzler et al., 2015). However, board involvement in innovation is empirically supported (Arzubiaga et al., 2018; Klarner et al., 2020; Schiehl et al., 2018), particularly through the strategic duties of directors (Querbach et al., 2020; Srinivasan et al., 2018; Vandenbroucke et al., 2016). Therefore, the decision to focus on SMEs is not trivial and is even more justified given that they constitute the overwhelming majority of the economic fabric of any region in the world (Mínguez-Vera and Martin, 2011; Van Gils, 2005), and that both corporate governance (Huse, 2000; Li et al., 2020; Zahra et al., 2007) and innovation (Ejdemo and Örtqvist, 2020; Love and Roper, 2015; Madrid-Guijarro et al., 2013) are crucial concepts to them.

All of these facts underscore the interest and scope of our study, which aimed to document an emerging phenomenon, namely, the link between corporate governance (at the board level) and strategy (specifically in terms of internal product/service innovation) in the context of SMEs. We tackled the need to incorporate the inherent complexity of studying the link between the BoD and innovation by approaching it as a multistage process between various components (i.e., board composition, roles, and effectiveness), integrating contingency factors (Chen et al., 2016; Lim and McCann, 2014; Zona et al., 2013), and following the suggestion to rely on a combination of theories (Aaboen et al., 2006; Chang and Wu, 2021; Robeson and O'Connor, 2013). Our approach is consistent with the fact that innovation requires both internal and external resources (Gurtner and Reinhardt, 2016; Piening and Salge, 2015). We took a step further by highlighting the sequential way in which a specific internal resource, the BoD, can influence innovation through its many facets.

The results revealed that board size has a significant and negative impact on human capital, which suggests that increasing the number of directors is not a viable option to expand the

pool of human capital. This finding is in line with agency theory, which argues that a larger board could cause cohesion problems (Goodstein et al., 1994; Jensen, 1993; Lipton and Lorsh, 1992), and resource dependence theory, which states that the number of directors must be coherent with the needs of the organization (Hillman et al., 2000; Hillman et al., 2009; Pfeffer and Salancik, 2003). This is also consistent with resource-based theory regarding the primacy of value/quality instead of the quantity of resources (Barney, 1991; Wernerfelt, 1984). Thus, although increasing board size could eventually enhance board human capital (Khana et al., 2014; Vandenbroucke et al., 2016), other avenues should be explored. An explanation for the negative impact of board size on innovation is that its increase might lead to greater diversity in terms of knowledge and skills, which does not necessarily affect organizational outcomes positively and directly (El Shoubaki et al., 2020; Guldiken et al., 2019; Zhu and Shen, 2016). Another explanation lies in the fact that board size is generally smaller in SMEs and tends to fluctuate according to the size and complexity of the firm (Coles et al., 2008; Eisenberg et al., 1998; Forbes and Milliken, 1999).

Board independence also had a significant and negative impact on human capital. Increasing the number of independent directors is again not a viable solution for increasing board human capital. This finding is in contrast with agency theory, which argues for the need to have more independent directors, given their monitoring tasks and information-processing abilities (Balsmeier et al., 2014; Hillman and Dalziel, 2003). It is also inconsistent with resource dependence theory, which argues that independent directors can facilitate access to external resources and provide human capital (Dalziel et al., 2011; Hillman and Dalziel, 2003). Our results rather support the idea that board independence could be less relevant for SMEs since it is closely linked to the monitoring role that is not as important as in large firms (Brunninge et al., 2007; Johannisson and Huse, 2000) and in the same vein that the strategic perspective is prominent in the specific context of SMEs (Uhlener et al., 2021; Voordeckers et al., 2007). Also, it suggests that the main advantages associated with independent directors, such as facilitating access to external resources, are not their prerogative (Kor and Sundaramurthy, 2009).

BoD's human capital proved to be a significant factor in explaining both board control and strategic roles through a positive impact. In accordance with resource dependence theory

(Pfeffer and Salancik, 2003), resource-based theory (Barney, 1991; Wernerfelt, 1984), and agency theory (Fama and Jensen, 1983; Jensen and Meckling, 1976), board human capital is undoubtedly one of the best concepts for understanding how directors can assume their tasks (Arzubiaga et al., 2018; Forbes and Milliken, 1999; Hillman and Dalziel, 2003; Hillman et al., 2009) and the potential contributions of the board at the organizational level (Haynes and Hillman, 2010; Johnson et al., 2013; Khanna et al., 2014; Kor and Sundaramurthy, 2009; Vandenbroucke et al., 2016). This suggests that board size and independence are not sufficient indicators of directors' abilities to fulfill their roles (Boivie et al., 2021; Hillman et al., 2000; Hillman and Dalziel, 2003) and should be complemented by the consideration of board human capital.

Our results also showed that BoD' control role had no significant impact on board effectiveness. This finding reflects the informal nature of SMEs, particularly in terms of governance and monitoring tasks of the BoD, through the near non-existence of agency problems, as well as the overlap of ownership and both functional and operational governance levels (Brammens et al., 2011; Brunninge et al., 2007; Dasilas and Papasyriopoulos, 2015; De Massis et al., 2016; Gnan et al., 2015; Gómez-Mejía et al., 2007; Huse, 2000; Zahra and Filatotchev, 2004). Overall, this finding suggests that board control role is not a relevant factor in assessing the degree of board effectiveness in the context of SMEs and ultimately in understanding the potential impact of directors on innovation.

The positive impact of board strategic role on board effectiveness can be partly attributed to the flexibility, consistency, and speed of SMEs in terms of strategic decision making (Brunninge et al., 2007; Hagen et al., 2012; Patel and Chrisman, 2014; Singh et al., 2008). Overall, the findings clearly support the relevance of board strategic roles for SMEs (Arzubiaga et al., 2018; Pugliese and Wenstøp, 2007; Van Gils, 2005). This is consistent with resource-based theory, which suggests that directors themselves could constitute strategic resources via their various skills and knowledge (Barney, 1991; Barroso-Castro et al., 2011; Wernerfelt, 1984). It also corroborates the postulates of resource dependence theory in that, among other things, the BoD is expected to mitigate its organization's dependence on its external environment (Hillman et al., 2000, 2009; Pfeffer and Salancik, 2003). These results more broadly support the rationale for not choosing to focus on either board composition or

board roles (Bendig et al., 2020; Miller and Triana, 2009), given the close relationship between these two concepts (Bernile et al., 2018; Pearce and Zahra, 1992). Thus, it seems that board composition (Hillman et al., 2000; Zona, 2016) and roles (Forbes and Milliken, 1999; Zattoni et al., 2015) are not only relevant for potentially explaining firm performance, but also board-level outcomes, namely, board effectiveness.

Regarding board effectiveness, our findings showed a positive and significant impact on innovation, as measured by internal product/service innovation. This supports our argument that board effectiveness is the most likely variable for explaining directors' contributions to specific organizational outcomes, particularly innovation. It is also in line with our assertion stating that board effectiveness is primarily a consequence of directors' task outcomes. Accordingly, this finding underlines the relevance of measuring board effectiveness on the basis of the concrete historical contributions of directors, such as the improvement of a firm's financial health and/or identification of new business opportunities (Bonini et al., 2021; Dalton et al., 1999; Zahra and Pearce, 1989), which have been shown to influence innovation (De Jong et al., 2013; Parmar et al., 2014; Zahra, 1996).

### **2.7.2. Theoretical/conceptual implications**

Our multistage theorization of the process by which the BoD influences innovation helps clarify how this complex link materializes in the context of SMEs and provides one of the rare empirical evidence on this specific topic. It shows more precisely that, as far as internal product/service innovation is concerned, board effectiveness is the element that binds directors to this specific organizational outcome. It also reveals that it is part of a broader process composed of four main stages that are articulated around board composition, board roles, and board effectiveness. Our empirical results support this reasoning and advocate the idea of a sequential logic, going from board composition to board roles to board effectiveness and finally arriving at innovation, while the dominant thesis in the current literature continues to be that of the direct link.

We also demonstrate that certain contingency factors, specifically SMEs' internationalization through foreign production and/or sales, are significant in explaining innovation, which allows us to relativize the influence of the BoD or at least contextualize it. Thus, our work



provides a much more nuanced position than that which emerges from the existing literature by showing that the link between the BoD and innovation is neither direct nor impervious to environmental variables.

Our study also provides rigorously supported conceptualizations, both theoretically and statistically, of different concepts (e.g., board human capital, control role, and effectiveness) on which future studies on SMEs' governance can rely. This seems particularly relevant given the lack of consensus regarding the measures of board variables, as well as the specificities distinguishing corporate governance in the context SMEs from that of large firms.

Finally, we highlight both the complementary and contradictory positioning that could be adopted depending on various theories, which revealed that it is possible to put forward almost any sign (negative or positive) for the same concepts when analyzing the link between board variables and innovation. This calls for a lot of precaution in the development of hypotheses and demonstrates the extent to which considering too few theories can bias the positions by directing toward a specific reasoning that could differ significantly if one or more other theories were mobilized. Therefore, neutral positioning may be the most optimal option, particularly when it comes to variables relating to aspects such as board composition.

### **2.7.3. Practical/political implications**

This study makes several practical/political contributions. First, it encourages SMEs to set up a formal governance body, such as a BoD, if they have not already done so. Several concepts related to directors have a significant impact on internal product/service innovation, which testifies to the benefits that can result from complementing the founder, CEO, and current management teams with a decision-making body like the BoD. Our study also provides new evidence that the board could be one of the most important governance bodies for SMEs, particularly through its strategic involvement in a broad sense, but also more specifically in terms of innovation. Thus, SMEs need to recognize that governance is not only for large corporations, while acknowledging the nuances between these two contexts.

SMEs that have already implemented a BoD should prioritize the training of its current members rather than seeking to increase the number of directors in general or the number of

independent directors in particular. They must also ensure that their BoD demonstrates a high degree of human capital, strategic thinking, and, above all, effectiveness. To this end, SMEs can refer to the different items that form each of these three constructs (e.g., directors with extensive knowledge of their firm's industry for board human capital, involvement in strategic planning for board strategic role, and evidence of historical board contributions in terms of business opportunities for board effectiveness) to implement concrete actions.

#### **2.7.4. Limitations and avenues for future research**

This study has certain limitations that indicate possibilities for future research. First, the focus on SMEs in the province of Québec (Canada) suggests that the results may be valid only in this specific context. Similar studies ought to be conducted in a variety of other geographic contexts to confirm whether the findings can be generalized. A replication of this study in the context of a governance system other than the Anglo-Saxon system (e.g., the Chinese, German or Japanese governance models) could be particularly insightful and would also provide a rich basis for comparison.

Second, given our relatively small sample size, and despite its consistency with governance studies based on primary data, our findings must be interpreted with caution. Paradoxically, a smaller sample could drive the positive significance of the results in structural equation modeling. Thus, a larger sample size would provide an even more solid basis to support the credibility of the findings. Such research would be ambitious given the many specificities and challenges inherent in this field of research (e.g., difficulty in accessing executives and the very low rate of SMEs with a formal governance structure such as a BoD), but it also reflects the potential scope of such an approach.

Third, the link between BoD and innovation merits more in-depth analysis using a qualitative method to derive a more substantial understanding of the underlying elements that explain the significant links identified here. Despite their many advantages, quantitative studies provide a more theoretical than practical understanding of the phenomenon under study. In this regard, qualitative studies have a complementary character that would help further decrease the level of abstraction, which would be particularly relevant for such a complex topic as the link between the BoD and innovation.

Fourth, our study does not claim to provide a consensus on the measures used for the various concepts under study, so although our choices were inspired by previous research and rigorously supported by statistical tests, different pathways could have been selected to establish the different constructs. Future studies would benefit from testing and enriching the constructs used in this study to avoid contradictory conclusions, especially given the importance of both the BoD and innovation for any firm, and that the literature at the junction of these two concepts continues to produce mixed results.

Finally, our analytical framework, although broader than most of those in previous studies, does not have the pretentiousness of covering the entire spectrum of relevant parameters to analyze the link between the BoD and innovation. Several other variables could be interesting, such as the concepts of board diversity regarding board composition, social capital to complement human capital, and the various transversal processes and behaviours within the BoD underlying its effectiveness.

In short, much remains to be done to demystify the potential impact of the BoD on innovation, especially in SMEs. We hope that this study will contribute to nourishing the reflection of scholars who are interested in examining this stimulating phenomenon, whose interest is not confined to scientific frontiers but is also largely palpable from a managerial point of view, as well as for policy makers.

## **2.8. References**

- Aaboen, L., Lindelöf, P., Von Koch, C., & Löfsten, H. (2006). Corporate governance and performance of small high-tech firms in Sweden. *Technovation*, 26, 955-968.
- Adams, R. B., & Ferreira, D. (2007). A theory of friendly boards. *The Journal of Finance*, 62, 217-250.
- Adams, R. B., Hermalin, B. E., & Weisbach, M. S. (2010). The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, 48, 58-107.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Bahl, M., Lahiri, S., & Mukherjee, D. (2021). Managing internationalization and innovation tradeoffs in entrepreneurial firms: Evidence from transition economies. *Journal of World Business*, 56, 101150.
- Baldenius, T., Melumad, N., & Meng, X. (2014). Board composition and CEO power. *Journal of Financial Economics*, 112, 53-68.

- Balsmeier, B., Buchwald, A., & Stiebale, J. (2014). Outside directors on the board and innovative firm performance. *Research Policy*, 43, 1800-1815.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Bammens, Y., Voordeckers, W., & Van Gils, A. (2011). Boards of directors in family businesses: A literature review and research agenda. *International Journal of Management Reviews*, 13, 134-152.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Barroso-Castro, C., Villegas, M. M., & Pérez-Calero, L. (2011). Board influence on a firm's internationalization. *Corporate Governance: An International Review*, 19, 351-367.
- Battaglia, D., & Neirotti, P. (2022). Dealing with the tensions between innovation and internationalization in SMEs: A dynamic capability view. *Journal of Small Business Management*, 60, 379-419.
- Baum, C. F., Lööf, H., Stephan, A., & Viklund-Ros, I. (2022). Innovation by start-up firms: The role of the board of directors for knowledge spillovers. *Research Policy* (in press), 51, 104375.
- Baumann, J., & Kritikos, A. S. (2016). The link between R&D, innovation and productivity: Are micro firms different?. *Research Policy*, 45, 1263-1274.
- Bauweraerts, J., Rondi, E., Rovelli, P., De Massis, A., & Sciascia, S. (2022). Are family female directors catalysts of innovation in family small and medium enterprises?. *Strategic Entrepreneurship Journal*, 16, 314-354.
- Baysinger, B. D., Kosnik, R. D., & Turk, T. A. (1991). Effects of board and ownership structure on corporate R&D strategy. *Academy of Management Journal*, 34, 205-214.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The Effect of Family Involvement on Innovation Outcomes: The Moderating Role of Board Social Capital. *Journal of Product Innovation Management*, 37, 249-272.
- Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods & Research*, 16, 78-117.
- Bernard, D., Blackburne, T., & Thornock, J. (2020). Information flows among rivals and corporate investment. *Journal of Financial Economics*, 136, 760-779.
- Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, 127, 588-612.
- Bianchi, M., Croce, A., Dell'Era, C., Di Benedetto, C. A., & Frattini, F. (2016). Organizing for inbound open innovation: how external consultants and a dedicated R&D unit influence product innovation performance. *Journal of Product Innovation Management*, 33, 492-510.
- Bjornali, E. S., Knockaert, M., & Erikson, T. (2016). The impact of top management team characteristics and board service involvement on team effectiveness in high-tech start-ups. *Long Range Planning*, 49, 447-463.
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.

- Bommaraju, R., Ahearne, M., Krause, R., & Tirunillai, S. (2019). Does a customer on the board of directors affect business-to-business firm performance?. *Journal of Marketing*, 83, 8-23.
- Boomsma, A. (1985). Nonconvergence, Improper Solutions, and Starting Values in LISREL Maximum Likelihood Estimation. *Psychometrika*, 50, 229-242
- Bonesso, S., Gerli, F., Pizzi, C., & Boyatzis, R. E. (2020). The role of intangible human capital in innovation diversification: linking behavioral competencies with different types of innovation. *Industrial and Corporate Change*, 29, 661-681.
- Bonini, S., Deng, J., Ferrari, M., John, K., & Ross, D. G. (2022). Long-tenured independent directors and firm performance. *Strategic Management Journal*, 43, 1602-1634.
- Bonini, S., & Lagasio, V. (2022). Board meetings dynamics and information diffusion. *Corporate Governance: An International Review*, 30, 96-119.
- Boyd, B. K. (1995). CEO duality and firm performance: A contingency model. *Strategic Management Journal*, 16, 301-312.
- Bradshaw, P., Murray, V., & Wolpin, J. (1992). Do nonprofit boards make a difference? An exploration of the relationships among board structure, process, and effectiveness. *Nonprofit and Voluntary Sector Quarterly*, 21, 227-249.
- Bravo, F., & Reguera-Alvarado, N. (2017). The effect of board of directors on R&D intensity: board tenure and multiple directorships. *R&D Management*, 47, 701-714.
- Brown, A. B., Dai, J., & Zur, E. (2019). Too busy or well-connected? Evidence from a shock to multiple directorships. *The Accounting Review*, 94, 83-104.
- Bruneel, J., Clarysse, B., & Autio, E. (2018). The role of prior domestic experience and prior shared experience in young firm internationalization. *International Small Business Journal*, 36, 265-284.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Burns, T., & Stalker, G. M. 1961. *The management of innovation*. London: Tavistock.
- Calabrò, A., & Mussolino, D. (2013). How do boards of directors contribute to family SME export intensity? The role of formal and informal governance mechanisms. *Journal of Management & Governance*, 17, 363-403.
- Calabrò, A., Torchia, M., Jimenez, D. G., & Kraus, S. (2021). The role of human capital on family firm innovativeness: the strategic leadership role of family board members. *International Entrepreneurship and Management Journal*, 17, 261-287.
- Camisón-Zornoza, C., Lapiedra-Alcamí, R., Segarra-Ciprés, M., & Boronat-Navarro, M. (2004). A meta-analysis of innovation and organizational size. *Organization Studies*, 25, 331-361.
- Chandy, R. K., & Tellis, G. J. (2000). The incumbent's curse? Incumbency, size, and radical product innovation. *Journal of Marketing*, 64, 1-17.
- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.
- Chemmanur, T. J., Gupta, M., & Simonyan, K. (2020). Top management team quality and innovation in venture-backed private firms and IPO market rewards to innovative activity. *Entrepreneurship Theory and Practice*, 46, 920-951.
- Chen, H. L. (2014). Board capital, CEO power and R&D investment in electronics firms. *Corporate Governance: An International Review*, 22, 422-436.

- Chen, S., Bu, M., Wu, S., & Liang, X. (2015). How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance. *Journal of Business Research*, 68, 1127-1135.
- Chen, J., Leung, W. S., & Evans, K. P. (2018). Female board representation, corporate innovation and firm performance. *Journal of Empirical Finance*, 48, 236-254.
- Chen, C. J., Lin, B. W., Lin, Y. H., & Hsiao, Y. C. (2016). Ownership structure, independent board members and innovation performance: A contingency perspective. *Journal of Business Research*, 69, 3371-3379.
- Cheng, L., Xie, E., Fang, J., & Mei, N. (2022). Performance feedback and firms' relative strategic emphasis: The moderating effects of board independence and media coverage. *Journal of Business Research*, 139, 218-231.
- Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics*, 87, 157-176.
- Coad, A. (2019). Persistent heterogeneity of R&D intensities within sectors: Evidence and policy implications. *Research Policy*, 48, 37-50.
- Cohen, W. M., & Levinthal, D. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35, 128-152.
- Colclough, S. N., Moen, Ø., Hovd, N. S., & Chan, A. (2019). SME innovation orientation: Evidence from Norwegian exporting SMEs. *International Small Business Journal*, 37, 780-803.
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all?. *Journal of Financial Economics*, 87, 329-356.
- Conyon, M. J., & Peck, S. I. (1998). Board control, remuneration committees, and top management compensation. *Academy of Management Journal*, 41, 146-157.
- Cornforth, C. (2001). What Makes Boards Effective? An examination of the relationships between board inputs, structures, processes and effectiveness in non-profit organisations. *Corporate Governance: An International Review*, 9, 217-227.
- Crucke, S., & Knockaert, M. (2016). When stakeholder representation leads to faultlines. A study of board service performance in social enterprises. *Journal of Management Studies*, 53, 768-793.
- Dalton, D. R., Daily, C. M., Johnson, J. L., & Ellstrand, A. E. (1999). Number of directors and financial performance: A meta-analysis. *Academy of Management Journal*, 42, 674-686.
- Dalziel, T., Gentry, R. J., & Bowerman, M. (2011). An integrated agency–resource dependence view of the influence of directors' human and relational capital on firms' R&D spending. *Journal of Management Studies*, 48, 1217-1242.
- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34, 555-590.
- Damanpour, F. (1992). Organizational size and innovation. *Organization Studies*, 13, 375-402.
- Dasilas, A., & Papasyriopoulos, N. (2015). Corporate governance, credit ratings and the capital structure of Greek SME and large listed firms. *Small Business Economics*, 45, 215-244.
- De Andres, P., & Vallelado, E. (2008). Corporate governance in banking: The role of the board of directors. *Journal of Banking & Finance*, 32, 2570-2580.
- De Jong, J. P. (2013). The decision to exploit opportunities for innovation: a study of high-tech small-business owners. *Entrepreneurship Theory and Practice*, 37, 281-301.

- De Massis, A., Frattini, F., Kotlar, J., Petruzzelli, A. M., & Wright, M. (2016). Innovation through tradition: Lessons from innovative family businesses and directions for future research. *Academy of Management Perspectives*, 30, 93-116.
- Deschamps, J. P., & Nelson, B. (2014). Innovation governance: How top management organizes and mobilizes for innovation. John Wiley & Sons.
- Deutsch, Y. (2007). The influence of outside directors' stock-option compensation on firms' R&D. *Corporate Governance: An International Review*, 15, 816-827.
- Diestre, L., Rajagopalan, N., & Dutta, S. (2015). Constraints in acquiring and utilizing directors' experience: An empirical study of new-market entry in the pharmaceutical industry. *Strategic Management Journal*, 36, 339-359.
- DiMasi, J. A., Grabowski, H. G., & Hansen, R. W. (2016). Innovation in the pharmaceutical industry: New estimates of R&D costs. *Journal of Health Economics*, 100, 20-33.
- Donaldson, L. (2001). *The contingency theory of organizations*. Sage.
- Donaldson, L., & Davis, J. H. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management*, 16, 49-64.
- Driver, C., & Guedes, M. J. C. (2012). Research and development, cash flow, agency and governance: UK large companies. *Research Policy*, 41, 1565-1577.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14, 57-74.
- Ejdemo, T., & Örtqvist, D. (2020). Related variety as a driver of regional innovation and entrepreneurship: A moderated and mediated model with non-linear effects. *Research Policy*, 49, 104073.
- Eliëns, R., Eling, K., Gelper, S., & Langerak, F. (2018). Rational versus intuitive gatekeeping: Escalation of commitment in the front end of NPD. *Journal of Product Innovation Management*, 35, 890-907.
- El Shoubaki, A., Laguir, I., & Den Besten, M. (2020). Human capital and SME growth: The mediating role of reasons to start a business. *Small Business Economics*, 54, 1107-1121.
- Elyasiani, E., & Zhang, L. (2015). Bank holding company performance, risk, and “busy” board of directors. *Journal of Banking & Finance*, 60, 239-251.
- Faleye, O., Hoitash, R., & Hoitash, U. (2011). The costs of intense board monitoring. *Journal of Financial Economics*, 101, 160-181.
- Faleye, O., Hoitash, R., & Hoitash, U. (2018). Industry expertise on corporate boards. *Review of Quantitative Finance and Accounting*, 50, 441-479.
- Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26, 301-325.
- Field, L., Lowry, M., & Mkrtchyan, A. (2013). Are busy boards detrimental?. *Journal of Financial Economics*, 109, 63-82.
- Filatotchev, I., Aguilera, R. V., & Wright, M. (2020). From governance of innovation to innovations in governance. *Academy of Management Perspectives*, 34, 173-181.
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39-50.
- Freel, M. S. (2000). Do small innovating firms outperform non-innovators?. *Small Business Economics*, 14, 195-210.

- Freixanet, J., Rialp, A., & Churakova, I. (2020). How do innovation, internationalization, and organizational learning interact and co-evolve in small firms? a complex systems approach. *Journal of Small Business Management*, 58, 1030-1063.
- Fulmer, I. S., & Ployhart, R. E. (2014). "Our Most Important Asset" a multidisciplinary/multilevel review of human capital valuation for research and practice. *Journal of Management*, 40, 161-192.
- Garcia Osma, B. (2008). Board Independence and Real Earnings Management: The Case of R&D Expenditure. *Corporate Governance: An International Review*, 16, 116-131.
- Garms, F. P., & Engelen, A. (2019). Innovation and R&D in the Upper Echelons: The Association between the CTO's Power Depth and Breadth and the TMT's Commitment to Innovation. *Journal of Product Innovation Management*, 36, 87-106.
- Gimenez-Fernandez, E. M., Sandulli, F. D., & Bogers, M. (2020). Unpacking liabilities of newness and smallness in innovative start-ups: Investigating the differences in innovation performance between new and older small firms. *Research Policy*, 49, 104049.
- Gómez-Mejía, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly*, 52, 106-137.
- Goodstein, J., Gautam, K., & Boeker, W. (1994). The effects of board size and diversity on strategic change. *Strategic Management Journal*, 15, 241-250.
- Guldiken, O., & Darendeli, I. S. (2016). Too much of a good thing: Board monitoring and R&D investments. *Journal of Business Research*, 69, 2931-2938.
- Gurtner, S., & Reinhardt, R. (2016). Ambidextrous idea generation—Antecedents and outcomes. *Journal of Product Innovation Management*, 33, 34-54.
- Hagen, B., Zucchella, A., Cerchiello, P., & De Giovanni, N. (2012). International strategy and performance—Clustering strategic types of SMEs. *International Business Review*, 21, 369-382.
- Hair, J.F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V.G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research", *European Business Review*, 26, 106-121.
- Harjoto, M. A., Laksmana, I., & Lee, R. (2015). Board diversity and corporate social responsibility. *Journal of Business Ethics*, 132, 641-660.
- Harjoto, M. A., Laksmana, I., & Yang, Y. W. (2018). Board diversity and corporate investment oversight. *Journal of Business Research*, 90, 40-47.
- Link, A. N., & van Hasselt, M. (2020). Exploring the impact of R&D on patenting activity in small women-owned and minority-owned entrepreneurial firms. *Small Business Economics*, 54, 1061-1066.
- Hauser, R. (2018). Busy directors and firm performance: Evidence from mergers. *Journal of Financial Economics*, 128, 16-37.
- Haynes, K. T., & Hillman, A. (2010). The effect of board capital and CEO power on strategic change. *Strategic Management Journal*, 31, 1145-1163.
- He, X., & Jiang, S. (2019). Does gender diversity matter for green innovation?. *Business Strategy and the Environment*, 28, 1341-1356.
- Helmets, C., Patnam, M., & Rau, P. R. (2017). Do board interlocks increase innovation? Evidence from a corporate governance reform in India. *Journal of Banking & Finance*, 80, 51-70.



- Hermalin, B. E., & Weisbach, M. S. (1998). Endogenously chosen boards of directors and their monitoring of the CEO. *American Economic Review*, 88, 96-118.
- Hervas-Oliver, J. L., Sempere-Ripoll, F., & Boronat-Moll, C. (2014). Process innovation strategy in SMEs, organizational innovation and performance: a misleading debate?. *Small Business Economics*, 43, 873-886.
- Heyden, M. L., Oehmichen, J., Nichting, S., & Volberda, H. W. (2015). Board background heterogeneity and exploration-exploitation: The role of the institutionally adopted board model. *Global Strategy Journal*, 5, 154-176.
- Hill, C. W., & Snell, S. A. (1988). External control, corporate strategy, and firm performance in research-intensive industries. *Strategic Management Journal*, 9, 577-590.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37, 235-256.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28, 383-396.
- Hillman, A. J., Nicholson, G., & Shropshire, C. (2008). Directors' multiple identities, identification, and board monitoring and resource provision. *Organization Science*, 19, 441-456.
- Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource dependence theory: A review. *Journal of Management*, 35, 1404-1427.
- Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal*, 39, 1084-1119.
- Horbach, J., & Jacob, J. (2018). The relevance of personal characteristics and gender diversity for (eco-) innovation activities at the firm-level: Results from a linked employer-employee database in Germany. *Business Strategy and the Environment*, 27, 924-934.
- Hoskisson, R. E., Hitt, M. A., & Hill, C. W. (1993). Managerial incentives and investment in R&D in large multiproduct firms. *Organization Science*, 4, 325-341.
- Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Grossman, W. (2002). Conflicting voices: The effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, 45, 697-716.
- Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1994). Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance. *Academy of Management Journal*, 37, 1207-1251.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Guo, H., Tang, J., Su, Z., & Katz, J. A. (2017). Opportunity recognition and SME performance: The mediating effect of business model innovation. *R&D Management*, 47, 431-442.
- Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, 48, 831-880.

- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Johannisson, B., & Huse, M. (2000). Recruiting outside board members in the small family business: An ideological challenge. *Entrepreneurship & Regional Development*, 12, 353-378.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Judge Jr, W. Q., & Zeithaml, C. P. (1992). Institutional and strategic choice perspectives on board involvement in the strategic decision process. *Academy of Management Journal*, 35, 766-794.
- Kafouros, M. I., Buckley, P. J., Sharp, J. A., & Wang, C. (2008). The role of internationalization in explaining innovation performance. *Technovation*, 28, 63-74.
- Kang, J. K., Liu, W. L., Low, A., & Zhang, L. (2018). Friendly boards and innovation. *Journal of Empirical Finance*, 45, 1-25.
- Kang, R., & Zaheer, A. (2018). Determinants of alliance partner choice: Network distance, managerial incentives, and board monitoring. *Strategic Management Journal*, 39, 2745-2769.
- Katila, R., & Ahuja, G. (2002). Something old, something new: A longitudinal study of search behavior and new product introduction. *Academy of Management Journal*, 45, 1183-1194.
- Khanna, P., Jones, C. D., & Boivie, S. (2014). Director human capital, information processing demands, and board effectiveness. *Journal of Management*, 40, 557-585.
- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Klarner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- Kor, Y. Y., & Misangyi, V. F. (2008). Outside directors' industry-specific experience and firms' liability of newness. *Strategic Management Journal*, 29, 1345-1355.
- Kor, Y. Y., & Sundaramurthy, C. (2009). Experience-based human capital and social capital of outside directors. *Journal of Management*, 35, 981-1006.
- Kosnik, R. D. (1990). Effects of board demography and directors' incentives on corporate greenmail decisions. *Academy of Management Journal*, 33, 129-150.
- Knockaert, M., & Ucbasaran, D. (2013). The service role of outside boards in high tech start-ups: A resource dependency perspective. *British Journal of Management*, 24, 69-84.
- Kumar, P., Zattoni, A., Marinovic, I., Povel, P., Kosová, R., Sertsios, G., ... & Berkowitz, J. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18, 399-429.

- Li, H., Terjesen, S., & Umans, T. (2020). Corporate governance in entrepreneurial firms: a systematic review and research agenda. *Small Business Economics*, 54, 43-74.
- Li, M. (2019). Diversity of board interlocks and the impact on technological exploration: A longitudinal study. *Journal of Product Innovation Management*, 36, 490-512.
- Lim, E. N., & McCann, B. T. (2014). Performance feedback and firm risk taking: The moderating effects of CEO and outside director stock options. *Organization Science*, 25, 262-282.
- Lin, W. C., & Chang, S. C. (2012). Corporate governance and the stock market reaction to new product announcements. *Review of Quantitative Finance and Accounting*, 39, 273-291.
- Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. *The Business Lawyer*, 48, 59-77.
- Lorca, C., Sánchez-Ballesta, J. P., & García-Meca, E. (2011). Board effectiveness and cost of debt. *Journal of Business Ethics*, 100, 613-631.
- Love, J. H., & Roper, S. (2015). SME innovation, exporting and growth: A review of existing evidence. *International Small Business Journal*, 33, 28-48.
- Lu, J., & Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, 48, 1-16.
- Ma, J., & Khanna, T. (2016). Independent directors' dissent on boards: Evidence from listed companies in China. *Strategic Management Journal*, 37, 1547-1557.
- Machold, S., & Farquhar, S. S. (2013). Board task evolution: A longitudinal field study in the UK. *Corporate Governance: An International Review*, 21, 147-164.
- Machold, S., Huse, M., Minichilli, A., & Nordqvist, M. (2011). Board leadership and strategy involvement in small firms: A team production approach. *Corporate Governance: An International Review*, 19, 368-383.
- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & Van Auken, H. (2013). An investigation of Spanish SME innovation during different economic conditions. *Journal of Small Business Management*, 51, 578-601.
- Marvel, M. R., & Lumpkin, G. T. (2007). Technology entrepreneurs' human capital and its effects on innovation radicalness. *Entrepreneurship: Theory and Practice*, 31, 807-828.
- Masulis, R. W., & Zhang, E. J. (2019). How valuable are independent directors? Evidence from external distractions. *Journal of Financial Economics*, 132, 226-256.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The impact of family ownership, management, and governance on innovation. *Journal of Product Innovation Management*, 32, 319-333.
- Mazzola, E., Perrone, G., & Kamuriwo, D. S. (2016). The interaction between inter-firm and interlocking directorate networks on firm's new product development outcomes. *Journal of Business Research*, 69, 672-682.
- McNulty, T., & Pettigrew, A. (1999). Strategists on the board. *Organization Studies*, 20, 47-74.
- McNulty, T., Zattoni, A., & Douglas, T. (2013). Developing corporate governance research through qualitative methods: A review of previous studies. *Corporate Governance: An International Review*, 21, 183-198.
- Mei, L., Zhang, T., & Chen, J. (2019). Exploring the effects of inter-firm linkages on SMEs' open innovation from an ecosystem perspective: An empirical study of Chinese manufacturing SMEs. *Technological Forecasting and Social Change*, 144, 118-128.

- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management studies*, 46, 755-786.
- Milliken, F. J., & Vollrath, D. A. (1991). Strategic decision-making tasks and group effectiveness: Insights from theory and research on small group performance. *Human Relations*, 44, 1229-1253.
- Mínguez-Vera, A., & Martín, A. (2011). Gender and management on Spanish SMEs: An empirical analysis. *The International Journal of Human Resource Management*, 22, 2852-2873.
- Minichilli, A., & Hansen, C. (2007). The board advisory tasks in small firms and the event of crises. *Journal of Management & Governance*, 11, 5-22.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.
- Nasirov, S., Li, Q. C., & Kor, Y. Y. (2021). Converting technological inventions into new products: The role of CEO human capital. *Journal of Product Innovation Management*, 38, 522-547.
- Oehmichen, J., Schrapp, S., & Wolff, M. (2017). Who needs experts most? Board industry expertise and strategic change—a contingency perspective. *Strategic Management Journal*, 38, 645-656.
- O'Neal, D., & Thomas, H. (1996). Developing the strategic board. *Long Range Planning*, 29, 314-327.
- Pang, C., & Wang, Y. (2020). Stock pledge, risk of losing control and corporate innovation. *Journal of Corporate Finance*, 60, 101534.
- Parmar, R., Mackenzie, I., Cohn, D., & Gann, D. (2014). The new patterns of innovation. *Harvard Business Review*, 92, 86-95
- Patel, P. C., & Chrisman, J. J. (2014). Risk abatement as a strategy for R&D investments in family firms. *Strategic Management Journal*, 35, 617-627.
- Payne, G. T., Benson, G. S., & Finegold, D. L. (2009). Corporate board attributes, team effectiveness and financial performance. *Journal of Management Studies*, 46, 704-731.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, 93, 44-54.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879.
- Prange, C., & Pinho, J. C. (2017). How personal and organizational drivers impact on SME international performance: The mediating role of organizational innovation. *International Business Review*, 26, 1114-1123.
- Protogerou, A., Caloghirou, Y., & Vonortas, N. S. (2017). Determinants of young firms' innovative performance: Empirical evidence from Europe. *Research Policy*, 46, 1312-1326.

- Provan, K. G. (1980). Board power and organizational effectiveness among human service agencies. *Academy of Management Journal*, 23, 221-236.
- Pugliese, A., Bezemer, P. J., Zattoni, A., Huse, M., Van den Bosch, F. A., & Volberda, H. W. (2009). Boards of directors' contribution to strategy: A literature review and research agenda. *Corporate Governance: An International Review*, 17, 292-306.
- Pugliese, A., & Wenstøp, P. Z. (2007). Board members' contribution to strategic decision-making in small firms. *Journal of Management & Governance*, 11, 383-404.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the Former CEO stays on Board: The Role of the Predecessor's Board Retention for Product Innovation in Family Firms. *Journal of Product Innovation Management*, 37, 184-207.
- Rasmussen, C. C., Ladegård, G., & Korhonen-Sande, S. (2018). Growth intentions and board composition in high-growth firms. *Journal of Small Business Management*, 56, 601-617.
- Ravasi, D., & Zattoni, A. (2006). Exploring the political side of board involvement in strategy: A study of mixed-ownership institutions. *Journal of Management Studies*, 43, 1671-1702.
- Raymond, L., & St-Pierre, J. (2010). R&D as a determinant of innovation in manufacturing SMEs: An attempt at empirical clarification. *Technovation*, 30, 48-56.
- Rindova, V. P. (1999). What corporate boards have to do with strategy: A cognitive perspective. *Journal of Management Studies*, 36, 953-975.
- Robeson, D., & O'Connor, G. C. (2013). Boards of directors, innovation, and performance: An exploration at multiple levels. *Journal of Product Innovation Management*, 30, 608-625.
- Rodríguez, A., & Nieto, M. J. (2016). Does R&D offshoring lead to SME growth? Different governance modes and the mediating role of innovation. *Strategic Management Journal*, 37, 1734-1753.
- Ruigrok, W., Peck, S. I., & Keller, H. (2006). Board characteristics and involvement in strategic decision making: Evidence from Swiss companies. *Journal of Management Studies*, 43, 1201-1226.
- Schiehl, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Sena, V., Duygun, M., Lubrano Lavadera, G., Marra, M., & Shaban, M. (2018). Board independence, corruption and innovation. Some evidence on UK subsidiaries. *Journal of Corporate Finance*, 50, 22-43.
- Shaikh, I. A., O'Brien, J. P., & Peters, L. (2018). Inside directors and the underinvestment of financial slack towards R&D-intensity in high-technology firms. *Journal of Business Research*, 82, 192-201.
- Sharma, V. (2011). Independent directors and the propensity to pay dividends. *Journal of Corporate Finance*, 17, 1001-1015.
- Singh, R. K., Garg, S. K., & Deshmukh, S. G. (2008). Strategy development by SMEs for competitiveness: a review. *Benchmarking: An International Journal*, 15, 525-547.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate board interlocks and new product introductions. *Journal of Marketing*, 82, 132-148.
- Stevenson, W. B., & Radin, R. F. (2009). Social capital and social influence on the board of directors. *Journal of Management Studies*, 46, 16-44.

- Stringer, R. (2000). How to manage radical innovation. *California Management Review*, 42, 70-88.
- Switzer, L. N., & Kelly, C. (2006). Corporate governance mechanisms and the performance of small-cap firms in Canada. *International Journal of Business Governance and Ethics*, 2, 294-328.
- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Thorgren, S., Wincent, J., & Anokhin, S. (2010). The importance of compensating strategic network board members for network performance: A contingency approach. *British Journal of Management*, 21, 131-151.
- Tian, J., Halebian, J., & Rajagopalan, N. (2011). The effects of board human and social capital on investor reactions to new CEO selection. *Strategic Management Journal*, 32, 731-747.
- Tranekjer, T. L., & Knudsen, M. P. (2012). The (unknown) providers to other firms' new product development: what's in it for them?. *Journal of Product Innovation Management*, 29, 986-999.
- Tzabbar, D., & Margolis, J. (2017). Beyond the startup stage: The founding team's human capital, new venture's stage of life, founder-CEO duality, and breakthrough innovation. *Organization Science*, 28, 857-872.
- Uhlaner, L., Wright, M., & Huse, M. (2007). Private firms and corporate governance: An integrated economic and management perspective. *Small Business Economics*, 29, 225-241.
- Umans, I., Lybaert, N., Steijvers, T., & Voordeckers, W. (2020). Succession planning in family firms: family governance practices, board of directors, and emotions. *Small Business Economics*, 54, 189-207.
- Vafeas, N. (2003). Length of board tenure and outside director independence. *Journal of Business Finance & Accounting*, 30, 1043-1064.
- Van den Berghe, L. A., & Levrau, A. (2004). Evaluating boards of directors: what constitutes a good corporate board?. *Corporate Governance: An International Review*, 12, 461-478.
- Vandenbroucke, E., Knockaert, M., & Ucbasaran, D. (2016). Outside board human capital and early stage high-tech firm performance. *Entrepreneurship Theory and Practice*, 40, 759-779.
- Van den Heuvel, J., Van Gils, A., & Voordeckers, W. (2006). Board roles in small and medium-sized family businesses: Performance and importance. *Corporate Governance: An International Review*, 14, 467-485.
- Van Gils, A. (2005). Management and governance in Dutch SMEs. *European Management Journal*, 23, 583-589.
- Veltrop, D. B., Hermes, N., Postma, T. J. B. M., & de Haan, J. (2015). A tale of two factions: Why and when factional demographic faultlines hurt board performance. *Corporate Governance: An International Review*, 23, 145-160.
- Wang, G., DeGhetto, K., Ellen, B. P., & Lamont, B. T. (2019). Board antecedents of CEO duality and the moderating role of country-level managerial discretion: a meta-analytic investigation. *Journal of Management Studies*, 56, 172-202.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5, 171-180.

- Wincent, J., Anokhin, S., & Örtqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME networks. *Journal of Business Research*, 63, 265-275.
- Wincent, J., Anokhin, S., & Örtqvist, D. (2013). Supporting innovation in government-sponsored networks: the role of network board composition. *International Small Business Journal*, 31, 997-1020.
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yoo, T., & Sung, T. (2015). How outside directors facilitate corporate R&D investment? Evidence from large Korean firms. *Journal of Business Research*, 68, 1251-1260.
- Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, 39, 1713-1735.
- Zahra, S. A., & Filatotchev, I. (2004). Governance of the entrepreneurial threshold firm: A knowledge-based perspective. *Journal of Management Studies*, 41, 885-897.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., Neubaum, D. O., & Naldi, L. (2007). The effects of ownership and governance on SMEs' international knowledge-based resources. *Small Business Economics*, 29, 309-327.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zarutskie, R. (2010). The role of top management team human capital in venture capital markets: Evidence from first-time funds. *Journal of Business Venturing*, 25, 155-172.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zattoni, A., Witt, M. A., Judge, W. Q., Talaulicar, T., Chen, J. J., Lewellyn, K., et al. (2017). Does board independence influence financial performance in IPO firms? The moderating role of the national business system. *Journal of World Business*, 52, 628-639.
- Zhu, D. H., & Shen, W. (2016). Why do some outside successions fare better than others? The role of outside CEOs' prior experience with board diversity. *Strategic Management Journal*, 37, 2695-2708.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.
- Zona, F., & Zattoni, A. (2007). Beyond the black box of demography: Board processes and task effectiveness within Italian firms. *Corporate Governance: An International Review*, 15, 852-864.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24, 299-315.

## **Chapitre 3 : Article 3 – Board-related processes and innovation in small and medium-sized enterprises: A continuum logic and configurational approach**

### **3.1. Résumé**

Cet article vise à identifier des configurations de processus originaux liés au CA (c.-à-d. établissement, intégration, centralisation et bureaucratie), qui peuvent stimuler l'innovation dans les PME. Une théorisation singulière y est développée autour d'une logique de continuum et divers postulats théoriques. Ultiment, son expérimentation via une approche configurationnelle appliquée à des données collectées auprès de 300 PME suggère que l'innovation peut résulter d'effets combinés entre quatre processus du CA, qui interviennent à différents moments et évoluent selon le niveau de croissance bidimensionnelle des PME (c.-à-d. taille et âge); dans le cadre de 10 configurations uniques. Ainsi, cette étude va notamment au-delà de la vision limitée qui prévaut actuellement dans la littérature quant à l'hypothèse de liens linéaires entre le CA et l'innovation et s'émancipe de la tendance consistant à établir des hiérarchies qui sous-entendent que certains éléments isolés seraient forcément prééminents par rapport à d'autres à des fins d'innovation.

**Mots-clés** : Conseil d'administration; Processus; FsQCA; Contingence; Innovation; PME.



### **3.2. Abstract**

This article aims to identify configurations of original board-related processes (i.e., establishment, integration, centralization, and bureaucracy) that can stimulate innovation in SMEs. A singular theorization is developed around a continuum logic and various theoretical postulates. Ultimately, its experimentation via a configurational approach applied to data collected from 300 SMEs showed that innovation may result from complex combined effects between four board-related processes, that occur at different times and evolve according to SMEs' bi-dimensional level of growth (i.e., size and age); through 10 unique configurations. Thus, this study notably goes beyond the limited view that currently prevails in the literature regarding the hypothesis of linear links between the BoD and innovation and emancipates itself from the tendency to establish hierarchies implying that certain isolated elements would necessarily be pre-eminent regarding innovation.

**Keywords:** Board of directors; Processes; FsQCA; Contingency; Innovation; SMEs.

### 3.3. Introduction

Innovation is a powerful driver of value creation (Bustinza et al., 2019; Hoskisson et al., 2002) and often a source of competitive advantage for organizations (Crossan and Apaydin, 2010; Teece et al., 2016). Therefore, it is of a strategic nature (Pfothenauer et al., 2019; Sjödin et al., 2020), particularly in SMEs (Barroso-Castro et al., 2022; Ejdemo and Örtqvist, 2020), which represent 95–99% of all businesses worldwide (OECD, 2021). However, innovation usually results from a complex process (Díaz-Díaz et al., 2021, McCann and Bahl, 2017), and numerous factors have been identified as potential vectors or inhibitors (Chester Goduscheit and Faullant, 2018; Foucart and Li, 2021). Thus, even if circumscribing the antecedents of innovation is fundamental, it represents a challenge that can lead to a tedious list of elements, inducing confusion and disparity.

The BoD is of particular interest in the race for innovation (Baum et al., 2022; Srinivasan et al., 2018). This governance body plays a significant role in this strategy (Chen et al., 2022; Deschamps and Nelson, 2014, p. 44) and instills the degree of risk assumed by firms regarding innovative initiatives (Sierra-Morán et al., 2021; Wu and Wu, 2014). These facts take on another dimension in the context of SMEs, where the BoD is considered an unconventional but strategic resource (Arzubiaga et al., 2018; Puthusserry et al., 2021) and a complement to executives rather than a control mechanism (Bammens et al., 2011; Gnan et al., 2015). Nonetheless, there is a need to better understand its strategic contributions (Lungeanu and Zajac, 2019; Panayi et al., 2021).

Furthermore, research on the BoD (Balsmeier et al., 2017; Pearce II and Patel, 2018) and principles of “good corporate governance” (Mutlu et al., 2018; Witt et al., 2022) are often articulated around board composition. However, while some board structures may be more beneficial than others (García-Ramos and Díaz, 2021; Paniagua et al., 2018), board composition alone is not sufficient to explain organizational performance (Johnson et al., 1996; Pearce II and Patel, 2018) and even less innovation (Kurzahls et al., 2020; Sierra-Morán et al., 2021). In this sense, the prevailing thesis today stating that board composition has an impact on innovation allows only a narrow understanding at best, and other avenues must be investigated.

In this perspective, board-related processes stand out, as these would influence the BoD's ability to conduct its duties, give meaning to its composition, and explain its impact on organizational outcomes (Forbes and Milliken, 1999; Pugliese et al., 2015). Thus, for more than three decades, several scholars have been trying to raise awareness about the relevance of board-related processes, which has also been repeated recently (Federo et al., 2020; Forbes and Milliken, 1999; Kumar and Zattoni, 2019; McNulty and Pettigrew, 1999; Pettigrew, 1992; Uhlaner et al., 2021; Zattoni et al., 2015). These calls, however, have not been heeded for three main reasons: (1) governance databases generally include board structural attributes easier to measure; (2) the board's inherent confidentiality cultivates a certain secrecy; (3) the difficulty of accessing directors (Klarner et al., 2020; Leblanc and Schwartz, 2007). Consequently, we know very little today about how the BoD can capitalize on its underlying processes to create value for organizations (Cheng et al., 2022), especially in terms of innovation and in the context of SMEs.

These considerations lead to the following question: how can the BoD, through its underlying processes, spur innovation in SMEs? This study seeks to answer it through the analysis of four original board-related processes (i.e., establishment, integration, centralization, and bureaucratic), whose relevance is tested using FsQCA based on a survey of 300 Canadian SMEs from various industries. The results highlight the strategic scope of the BoD and shows that this governance body is a key tool by confirming its relevance for innovation purposes in SMEs. Specifically, we find that distinct processes are involved at different times to explain the influence of the BoD on innovation in SMEs. Additionally, we conclude that innovation in SMEs can arise from 10 complex configurations, including board-related processes and contingency factors. Overall, these observations corroborate the relevance of adopting a continuum logic through a configurational approach from a contingency perspective.

This paper makes several contributions that go beyond traditional theories, current empirical evidence, and conventional good practices in corporate governance. It proposes an original theorization of four board-related processes that demonstrate that the link between the BoD and innovation in SMEs involves upstream, midstream, and downstream processes. This provides a singular comprehension of this link and allows to enrich the conclusions available

to date, which are mainly based on midstream-level analyzes. Additionally, it identifies various complex combinations including board-related processes and contingency factors that can be examined as potential mechanisms to stimulate innovation in SMEs. These contributions, which are rooted in theoretical, empirical, and methodological considerations, ultimately led to the emergence of multiple recommendations to guide practitioners and policymakers as to some concrete actions to be taken when the goal is to help SMEs strive for higher levels of innovation.

The remainder of the paper is divided in five sections. The next section presents the literature review and research propositions. Then, the methodology is described, before displaying the results. Finally, a discussion around the findings and brief concluding remarks close this study.

### **3.4. Conceptualization, Theorization, and Propositions**

#### **3.4.1. Board-related processes and innovation**

The model of board processes proposed by Forbes and Milliken (1999) informed the approach of most studies that have explored aspects beyond board composition and roles (Arzubiaga et al., 2018; Zattoni et al., 2015; Zhu et al., 2016). This model comprises three processes (i.e., effort norms, cognitive conflicts, and use of skills and knowledge) that have enabled major advances in the understanding of the functioning of the BoD based on social-psychological processes. Ultimately, this has made it possible to better assimilate how board-related processes can influence the performance of directors individually and collectively, and that of their organizations (Ingley and van der Walt, 2005; Minichilli et al., 2012; Zattoni et al., 2015). However, in this model, several distinct board processes are intertwined or simply absent. Moreover, it is built around the reality of large firms and does not allow one to consider the nuances of the governance of SMEs fully. Furthermore, this model omits important contingencies, especially for SMEs, such as firm size and age. These three major limitations of the model proposed by Forbes and Milliken (1999) model are highlighted by the authors themselves in their seminal article.

Based on these three main arguments, we theorize about a model complementary to that of Forbes and Milliken (1999). This model is built around four original board-related processes

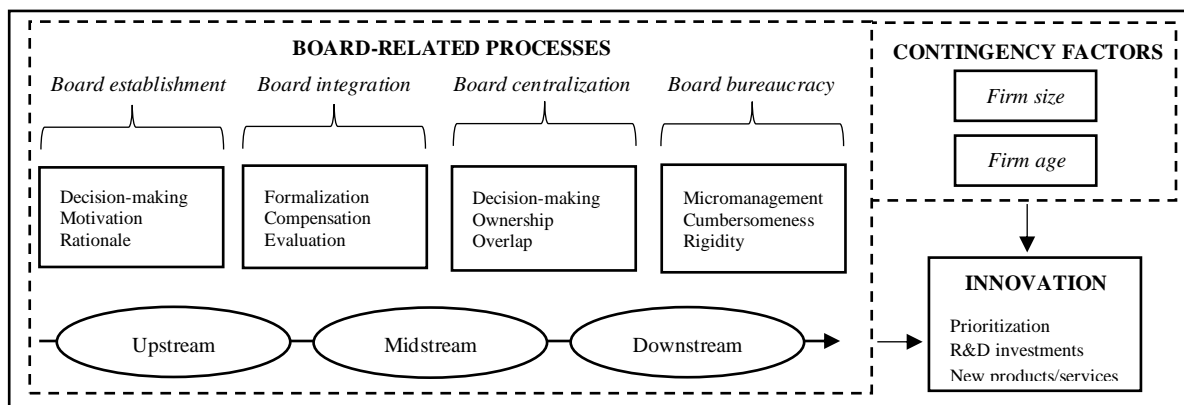
following a continuum logic. It is also more in tune with the specificities of corporate governance in the context of SMEs, such as the high levels of implication of venture capitalists, the importance of the founder, and the differences in agency effects (Li et al., 2020; Zahra et al., 2007). Moreover, it attaches considerable importance to contingencies, which is fundamental when analyzing the BoD and considering as an outcome strategy in general or innovation in particular (Díaz-Díaz et al., 2022; Oehmichen et al., 2017; Zona et al., 2013). It does so by including two contingency factors in our model: firm size and age. Finally, our model is based on a configurational approach to identify combinations of factors rather than focusing on isolated elements to explain innovation. This point takes on its full meaning given that both strategic leadership and innovation imply a complex process and involve multiple factors (Cortes and Herrmann, 2021; Davis and Bendickson, 2021; Foucart and Li, 2021).

All four board-related processes are rooted in resource-based theory and resource dependence theory. Concretely, for SMEs, through its underlying processes, a BoD potentially constitutes a valuable resource. It can increase the pool of knowledge and expertise in addition to providing an external perspective and a rich network, all of which are crucial to manage tensions within organizations or arising from the external environment and ultimately spur innovation (Barney, 1991; Pfeffer and Salancik, 2003). Furthermore, the four board-related processes find their essence in stakeholders' theory, which stipulates that value creation and particularly innovation can result from the BoD following rigorous processes, allowing this governance body to help firms manage and balance their multiple relationships (Chen and Liu, 2020; Freeman, 1984; Wu, 2008). Finally, these processes also draw on contingency theory (Burns and Stalker, 1961; Csaszar and Ostler, 2020) and complexity theory (Kauffman, 1993; García-Ramos and Díaz, 2021), given the difficulty of analyzing board-related processes and the need to look outside the BoD to gain a complete understanding of its potential contributions, especially in terms of innovation.

The general definition appearing in the latest edition of the Oslo Manual is the one used to describe the notion of innovation in our conceptual framework: « *An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users*

(product) or brought into use by the unit (process) » (Oslo Manual, 2018, p. 20). A certain consensus has been established around this definition in the scientific and business worlds. In terms of operationalization, it is more precisely internal product/service innovation that has been retained. The main reason explaining this initiative is that this specific type of innovation refers to aspects over which the BoD can exercise significant influence. These include the degree of prioritization of innovation (Klarner et al., 2020; Schiehl et al., 2018), the degree of R&D investments (Almor et al., 2019; Díaz-Díaz et al., 2022), and the degree of new products/services (Srinivasan et al., 2018; Wu and Wu, 2014) of SMEs compared to their main competitors. Figure 7 illustrates our conceptual model.

**Figure 7.** Conceptual framework of board-related processes following a continuum logic through a configurational approach and from a contingency perspective



### 3.4.1.1. Board-related establishment process and innovation

Numerous studies have focused on the composition of the BoD to explain organizational performance, as the leadership structure through the presence of outside directors or the number of directors might affect their functioning and scope (Boivie et al., 2021; Dalton et al., 1998). However, much remains to be discovered about the antecedents of board composition (Allemand et al., 2022; Hillman and Dalziel, 2003; Kim and Cannella Jr., 2008), especially regarding their repercussions. Scholars generally start from the premise of an already existing BoD. Nevertheless, boards' responsibilities and effectiveness are partly determined by the process of setting up and selecting directors (Cravenes et al., 2001; Drymiotes and Sivaramakrishnan, 2021). This means that if board composition can affect organizational performance, upstream processes that shape board structures can do the same

(Yildirim-Öktem and Üsdiken, 2010). This becomes even more apparent knowing that the impact of directors depends on their evolution (Elms et Pugliese, 2022; Garg et al., 2019; Westphal and Zajac, 1995), for which the starting point is the establishment of this governance body. In this sense, board-related establishment process aims to capture the motivations, the decision-making process, and the rationale underlying such an initiative in SMEs.

The choice of establishing a BoD for SMEs raises several philosophical and legal issues (Arzubiaga et al., 2018; Uhlaner et al., 2021). In many cases of SMEs, as the shareholding is often made up almost exclusively of the founder, to which family members are sometimes added, the approach would be much less “capitalist” (Anderson and Reeb, 2004). The well-being, the feeling of accomplishment, and the reputation would constitute elements of at least equal if not greater importance than the maximization of profits. In this continuity, SMEs are generally characterized by a very low level of agency problems (Dasilas and Papasyriopoulos, 2015; Gnan et al., 2015; Zahra and Filatotchev, 2004), especially in family businesses (Arzubiaga et al., 2018; Bammens et al., 2011; Voordeckers et al., 2007). Also, the choice for SMEs to set up a governance structure does not fit into the traditional and rather coercive logic attributable to agency theory and large firms, according to which the primary objective behind such an initiative is to safeguard the interests of shareholders by exercising control over managers. More broadly, it deviates from the institutional perspective suggesting that the establishment of a BoD or initiatives surrounding this governance body mainly result from external pressures, even if it is a reality in some contexts such as the USA or when topics like diversity are involved (Fiegener et al., 2000; Guldiken et al., 2019; Judge and Zeithaml, 1992).

Therefore, SMEs have a distinctive way to orchestrate their governance. They tend to favor “informal governance” (Brunninge et al., 2007) or governance that is “less professional” (Zahra and Filatotchev, 2004). Consequently, the notion of governance in the context of SMEs often amounts to the CEO-founder (Deb and Wiklund, 2017; Strese et al., 2018), on which they are highly dependent (Randøy and Goel, 2003; Rasmussen et al., 2018; Van den Heuvel et al., 2006). Similarly, when SMEs choose to establish governance structures, they tend to favor bodies less formal than a BoD but more solemn than simply articulating

governance around the CEO-founder, such as advisory boards (Ding et al., 2013; Schiehl et al., 2018) and family councils (Arzubiaga et al., 2018; Gnan et al., 2015). Nevertheless, some SMEs make the unconventional choice of establishing a BoD and understanding the rationale of this decision is relevant to assimilating the potential strategic scope of this governance body, especially in terms of innovation.

The scarcity of resources that SMEs must deal with, which suggests that they should go beyond their internal knowledge and skills if they want to innovate (Colclough et al., 2019; Street and Cameron, 2007), points to the relevance of establishing a BoD. Indeed, a BoD could help SMEs gain external perspectives (Minichilli et al., 2009), which, in turn, could help mitigate the founder's potential lack of experience (Zahra and Filatotchev, 2004) and ultimately foster innovation. The human and social capital that directors can bring to SMEs (Barroso-Castro et al., 2022; Purkayastha et al., 2021) further illustrates that setting up a BoD can facilitate access to resources for SMEs, which is crucial to innovate. These factors help better understand why the BoD would be as important for SMEs as it is for large firms (Puthusserry et al., 2021; Huse, 2000). Thus, an element that could be involved in the board-related establishment process for SMEs and that may be particularly relevant for innovation purposes is the need to tap into new expertise.

Establishing a BoD can also be part of a desire to be in line with industry best practices and be rooted in the institutional perspective. Investors usually compare firms within a given sector to guide their investment decisions and adapt their firms' governance practices to that of other organizations within their industry (Okhmatovskiy and David, 2012). Further, among the key factors that affect the management of innovation are best practices in terms of leadership and strategy (Ben Rejeb et al., 2008), which are aspects that refer to the BoD. However, to understand their relevance for innovation, it is essential to avoid blindly following them (Pisano, 2015) and contextualize them, especially because they are usually tacit and ambiguous (Un and Asakawa, 2015). This could explain why many best practices in corporate governance have not been empirically supported (Heracleous, 2001; Dalton and Dalton, 2005). The problem is that these are generally articulated around board structural attributes. Therefore, the processes are neglected (Dalton and Dalton, 2006), which could hinder the BoD in its strategic contributions (Boivie et al., 2021). Nevertheless, best practices



related to corporate governance have proven to be relevant to innovation, and many renowned firms in the high-tech industry have introduced some structures such as technology advisory boards for this purpose (Shaikh and Randhawab, 2022). Furthermore, following best practices at the board level can influence the firms' legitimacy and acceptance (Steckler and Clark, 2019). In other words, the alignment of SMEs on industry best practices, when it is conducted properly, can be judicious because this would optimize the adequacy with sectorial specificities. This represents another element that could be involved in board-related establishment process and may be particularly relevant for innovation purposes in SMEs.

Moreover, governance bodies play a significant role in mitigating tensions arising from strategic decisions, such as those related to innovation (Venugopal et al., 2020). The BoD's functioning is closely linked to the strategic involvement of its members and could ultimately contribute to innovation in SMEs (Arzubiaga et al., 2018; Machold et al., 2011). Further, in the context of SMEs, the BoD is considered a strategic resource (Barroso-Castro et al., 2022; Puthusserry et al., 2021) and a complement to executives rather than a control mechanism (Bammens et al., 2011; Gnan et al., 2015). This suggests that the BoD's strategic scope is as much or even more important for SMEs than for their larger counterparts (Brunninge et al., 2007; Bauweraerts et al., 2019).

A BoD is also useful from a more symbolic perspective, particularly because it confers a certain legitimacy to organizations (Singh et al., 1986; Bucheli and Salvaj, 2018). This legitimacy is far from being only symbolic because it allows firms to forge links with external partners (Federo et al., 2020; Pearce II and Patel, 2018). This adds to its importance as innovation can often result from a collaborative approach that requires to transcend organizational boundaries (McGahan et al., 2021; West and Bogers, 2014). In this sense, even if the BoD can have both a symbolic and more concrete impact (Gai et al., 2021), it remains, in all cases, a relevant body that can significantly foster innovation. This reasoning leads to the following proposition.

*P1: Board-related establishment process, which reflects the concrete motivations underlying the choice of setting up a BoD as well as the decision-making process and rationale of such an initiative, is a part of the sufficient (present) conditions leading to high levels of innovation in SMEs.*

### **3.4.1.2. Board-related integration process and innovation**

Once the BoD has been established, firms must ensure its members can deploy their full potential under optimal conditions. In other words, SMEs must have a proper integration process for new directors. The first aspect underlying this process is the orientation of directors. This can translate into establishing standardized and common procedures, which occasionally prove to be innovation-enhancing for SMEs (Gentile-Lüdecke et al., 2020; López et al., 2019). Orienting directors has been linked to several aspects that are potential vectors of innovation, such as the training of directors and the presence of guidelines (Kurzahls et al., 2020; Wu, 2008). However, a “rigid orientation” that can be considered as a certain formalization does not fit well with SMEs’ culture (Herrmann and Nadkarni, 2014; McKiernan and Morris, 1994; Puthusserry et al., 2022). Overall, for both SMEs’ and large firms’ BoD, communication is mainly informal as numerous discussions happen before and after meetings (Ingley et al., 2017; Luciano et al., 2020). Supporting this position, it has been found that informality within the board is valued even in the largest and most innovative pharmaceutical firms (Klarner et al., 2020). It could also lead to more open communication and affect the time newcomers take to understand board dynamics and processes (Elms and Pugliese, 2022). Accordingly, in SMEs, it seems more appropriate to consider the notion of orientation through a more flexible prism, which translates into taking the necessary measures to ensure that directors share the firm’s goals and values. This aspect has long been identified as an important factor in groups (Blau, 1960), particularly for BoD (Kosnik, 1990; Meyer and Altenborg, 2007). It refers to affective, cognitive, and behavioral aspects (Pedersen and Tallman, 2022; Torres de Oliveira et al., 2020), which can enhance learning in collaboration and absorptive capacity, both of which are related to innovation (Cohen and Levinthal, 1990; Enkel et al., 2018). These elements suggest that orienting directors, which in the case of SMEs takes the form of a more flexible approach compared to their larger counterparts, can influence innovation.

Orientation is only one aspect in successfully integrating directors. A successful integration also requires motivating them to perform their duties adequately, which may involve monetary incentives, such as annual bonuses, director fees, committee fees, or stock grants (Dah and Frye, 2017; Farrell et al., 2008). The importance of directors’ remuneration

regarding their integration is more palpable through the concepts of social comparison and reciprocity, which regulate the type and amount of compensation awarded to board members (Boivie et al., 2015), although their qualifications are of paramount importance to this end (Fedaseyeu et al., 2018). The mechanism underlying directors' compensation is closely linked to agency issues, an essential element of which is to align the interests of principals (i.e., shareholders) and agents (i.e., managers) through the BoD (Rodrigues et al., 2020). For example, granting shares to directors makes compensation dependent on the firm's value and, therefore, its performance (Deutsch et al., 2007; Sheikh et al., 2018). Thus, directors' compensation has been found to improve firm performance (Doucouliagos et al., 2007; Engel et al., 2019). By extension, incentives can facilitate developing strategic links (Borch and Huse, 1993), pursuing long-term goals (Shaikh et al., 2019), fulfilling roles (Neville et al., 2019), and the quest for innovation (Griffin et al., 2021; Lim and McCann, 2014; Zahra et al., 2000).

A third aspect associated with board-related integration process refers to directors' evaluation. The BoD's performance must be audited to assess its performance and satisfaction, and the required adjustments must be made. This procedure facilitates the complete integration of new directors. Notably, directors' effectiveness depends on their ability to perform their duties and work together—their cohesion (Forbes and Milliken, 1999; Zattoni et al., 2015). This implies that an extensive pool of expertise is not sufficient; there should also be a harmonious match among individuals seating on the BoD. Therefore, it is essential to plan a detailed and transparent evaluation process for all board members (Hoppmann et al., 2019; Lee and Phan, 2000). This is especially relevant given that evaluating directors can be a vector of value creation and improve decision-making within the board (Minichilli et al., 2007; Rasmussen, 2015; Vandebeek et al., 2016). In this sense, recently, there has been many calls aimed at raising awareness regarding the relevance of evaluating the BoD to better understand the commitment and scope of this governance body (Kaczmarek and Nyuur, 2021; Vandebeek et al., 2021). This reasoning leads to the following proposition:

*P2: Board-related integration process, which reflects the orientation, incitation, and evaluation of the BoD, is part of the sufficient (present) conditions that lead to high levels of innovation in SMEs.*

### **3.4.1.3. Board-related centralization process and innovation**

Centralization is one of the concepts that mostly distinguishes SMEs' governance from that of large corporations (Forbes and Milliken, 1999; Gnan et al., 2015; van den Heuvel et al., 2006). This is primarily reflected in ownership and power (Brunninge et al., 2007; Ingley et al., 2017), which are often exacerbated in family businesses (Arzubiaga et al., 2018; Bammens et al., 2011). Power can also be concentrated among venture capitalists (Garg and Eisenhardt, 2017; Rosenstein et al., 1993) or mobilized by an individual, such as a CEO, particularly in terms of decision-making prepotency (Hsu et al., 2013; Tang et al., 2017). This is more pronounced in SMEs because the CEO is often also the founder (Deb and Wiklund, 2017). These factors partly explain SMEs' interest in hiring independent directors (Barroso-Castro et al., 2020; Rasmussen et al., 2018) to tend toward a certain degree of decentralization and avoid the potential adverse effects attributable to the overlap between shareholders, directors, and managers (Gnan et al., 2015; Shehata et al., 2017).

Various forms of board-level centralization are relevant to innovation (Bendig et al., 2020; Querbach et al., 2020; Strese et al., 2018), although decentralization is generally preferable. Centralization may increase instability in terms of financial performance and complicate strategic change—two aspects closely linked to innovation (Smith and Tranfield, 2005; Tran and Turkiela, 2020; Zahra, 1996). Moreover, restricting decision-making authority to a very limited number of individuals (e.g., founder, CEO or family members) decreases the potential inputs during discussions (e.g., diversity of perspectives, number of ideas, or constructive debates) (Ma et al., 2020). This potential hazard is even greater in SMEs because the traditional governance chain (i.e., shareholders, BoD, and TMT) is often absent (Arzubiaga et al., 2018; Martin et al., 2016). This naturally reduces the governance entities that could help the organization in its quest for innovation.

Thus, while the CEO is certainly an important entity for innovation (Nag et al., 2020), he would benefit from being surrounded by directors with a high degree of skills and knowledge

and a rich and extensive network (Schiehl et al., 2018; Wincent et al., 2010). This need is even more apparent regarding product/service innovation, which has complex antecedents (Curado et al., 2018; Storey et al., 2015) and implies that power decentralization would be a better choice. Therefore, it becomes clearer to understand why some authors have found that centralization is undesirable regarding innovation as it could notably reduce creativity (Damanpour et al., 2018; Gentile-Lüdecke et al., 2020; Vendrell-Herrero et al., 2018). This reasoning leads to the following proposition:

*P3: Board-related centralization process, which reflects the concentration of power, decision-making, and ownership within the BoD, is part of the sufficient (absent) conditions that lead to high levels of innovation in SMEs.*

#### **3.4.1.4. Board-related bureaucratic process and innovation**

Although a BoD can be beneficial for organizations, it also has drawbacks, as reflected in the centralization process. Some other elements demonstrate that a BoD can become more harmful than beneficial to firms, particularly because of the different levels of engagement and the varying behaviors of its members (Bezemer et al., 2018; Uhlaner et al., 2021). In some cases, the 'BoD can ultimately become cumbersome, rigid, and of little strategic value. Hence, we refer to this downstream process as “bureaucratic.”

SMEs need to exert greater effort than their larger counterparts to deal with technological changes because of resource scarcity (Lee et al., 2012; Valentim et al., 2016). Moreover, SMEs’ success depends largely on their ability to leverage knowledge and develop new products/services (Zahra et al., 2007). These fundamental considerations, while relevant for innovation, suggest that those surrounding the BoD might not be a priority for SMEs. Further, given that conflicts of interest between shareholders and managers are less likely to emerge in SMEs (Bauweraerts et al., 2021; Dasilas and Papasyriopoulos, 2015), the BoD can be perceived as a cumbersome rather than a relevant instrument (Lioukas and Reuer, 2020; Williamson, 1991).

Furthermore, in cases where a board might exercise restrictive control over less connected directors and managers, it could be viewed as an infringement on their autonomy and independence. This could explain why some SMEs favor advisory boards, as this type of

governance structure does not necessarily involve legal liability and is considered more harmonious within their context (Bertschi-Michel et al., 2021; Blumentritt, 2006). Similarly, a less rigid governance body, such as a family council, could be regarded as a suitable substitute to the BoD. This is because it is likely to focus on aspects in tune with the realities of SMEs (Gnan et al., 2015; Leung et al., 2020). In short, the BoD could turn out to be rigid for SMEs and therefore not be compatible with their culture.

A BoD's limited strategic range is another potential disadvantage in the context of SMEs. While innovation is certainly strategic in nature (Miroshnychenko et al., 2021; Wincent et al., 2010), SMEs are less formal than their larger counterparts. Therefore, they usually do not report an innovative culture as the innovation process is often not conducted structurally (Terziovski, 2010). This is partly because the notion of strategy is mainly within the purview of the CEO in SMEs (Barroso-Castro et al., 2022; Nag et al., 2020). Thus, the BoD might potentially be relegated to more operational activities and fall into micromanagement, which could raise questions about its strategic scope. Moreover, to innovate, SMEs must manage various constraints, including access to resources (Bodlaj et al., 2020). To overcome these constraints, they usually resort to informal options, either at the institutional level (Schwens et al., 2011), in networking (Borch and Huse, 1993), or to access financing (Rao et al., 2021). This is consistent with SMEs' often short-term vision (Del Brio and Junquera, 2003), which is reflected in their managers' orientation (Preller et al., 2020). A BoD may not fit this paradigm. This reasoning leads to the following proposition:

*P4: Board-related bureaucratic process, which reflects the potential cumbersomeness, rigidity, and limited strategic scope of the BoD, is part of the sufficient (absent) conditions that lead to high levels of innovation in SMEs.*

### **3.4.2. Contingency factors and innovation**

The environment in which an organization operates is important, especially regarding product/service innovation (Morgan and Anokhin, 2020; Wu and Wu, 2014). Therefore, it is necessary that our conceptual framework extends beyond the BoD, as recommended by recent studies in the field of corporate governance (García-Ramos and Díaz, 2021; Puthusserry et al., 2021; Tasheva and Hillman, 2019). This study more specifically analyzes

two organizational characteristics commonly integrated into the analysis when linking the BoD to innovation: firm size and age (Arzubiaga et al., 2018; Miller and Triana, 2009; Zona et al., 2013).

#### **3.4.2.1. Firm size**

Firm size is particularly relevant for capacity issues and is important to consider for innovation purposes in SMEs. R&D is usually less formalized (Kleinknecht, 1989; Shefer and Frenkel, 2005) in SMEs, which could partly explain why other elements, such as knowledge, collaboration, and networks, could be more powerful drivers of innovation in this context (Hervás-Oliver et al., 2021). On their part, larger organizations tend to pursue innovation more aggressively than their smaller counterparts, mainly by investing more in R&D (Gimenez-Fernandez et al., 2020; Wakasugi and Koyata, 1997). However, although previous meta-analyses found that a larger size could be preferable to stimulate innovation, the literature on this concept also reports mixed results. This is particularly because the measures of both firm size and innovation showed considerable heterogeneity (Camisón-Zornoza et al., 2004; Damanpour, 1992). These observations point to several hypotheses: firm size may induce complexity that hinders innovation; firm size may exert different influences depending on the specific types of innovation; other parameters may cause the impact of firm size on innovation to fluctuate. This reasoning leads to the following proposition:

*P5: Firm size is part of the sufficient (present or absent) conditions that lead to high levels of innovation in SMEs.*

#### **3.2.2.2. Firm age**

Firm age would not be sufficient to explain organizations' capacity to innovate. It is important to examine its underlying elements, such as how older firms can mutually create knowledge with partners (Bouncken et al., 2021), and the relationships between firm age and other concepts, such as SMEs' intangible resources and entrepreneurial orientation (Anderson and Eshima, 2013). Thus, SMEs' age should be analyzed through the prism of different factors, such as their ability to innovate (Hervas-Oliver et al., 2021; Leyva-de la Hiz and Bolívar-Ramos, 2022). The specific type of innovation is also relevant for examining the

link between firm age and innovation (Mabenge et al., 2020), especially because age could indicate a firm's ability to exploit resources (Jiang et al., 2020). Further, different types of innovation might require different types of resources (Haneda and Ito, 2018). Overall, these elements lead to the same main conclusion as for firm size: firm age could explain variations in terms of innovation, but it is difficult to take a categorical position regarding the presence or absence of this condition as many other parameters should be considered to fully capture its impact on innovation. This reasoning leads to the following proposition:

*P6: Firm age is part of the sufficient (present or absent) condition that leads to high levels of innovation.*

## **3.5. Methodology**

### **3.5.1. Sample and data**

The sample comprises SMEs, which are firms with fewer than 250 employees (Kang et al., 2022; Raes et al., 2022), but at least 20 employees, based in Québec (Canada). A survey via telephone was conducted between June 4 and July 7, 2020. The questionnaire was administered to the main executive of the company, and the average call duration was approximately 15 minutes. A total of 487 observations were collected from the 1,933 SMEs contacted—approximately 25% response rate, which is higher than that obtained by previous studies (e.g., Arzubaga et al., 2018; Minichilli et al., 2009; Zona et al., 2013). Of the 300 valid questionnaire responses, 37% had a BoD, yielding a final sample of 112 SMEs, which is superior to that of prior research on the BoD (e.g., Barroso-Castro et al., 2022; Schiehl et al., 2018). The total number of observations is even more appreciable considering that past empirical evidence in this field has usually relied on national-level surveys. However, this study was conducted at the regional level, which also made it possible to avoid certain contextual biases related to regional specificities (Parrilli et al., 2020; Shearmur and Doloreux, 2016).

SMEs included in the sample have been in operation for an average of 40 years (median is 36), and their average size is 65 employees (median is 40). They are spread across all the regions of the province of Quebec, mainly in the cities of Montreal (24%) and Quebec (11%). These SMEs come from all industries represented in the North American Industry



Classification System. The most represented sectors are retail trade (29%), manufacturing (22%), service (17%), and construction (10%). Approximately half of the surveyed SMEs are family businesses (51%). Concerning their turnover, 45% have less than 10 million, 20% have between 11 and 25 million, and 24% have more than 25 million Canadian dollars. The establishment of the BoD occurs after 23 years of existence on average. Finally, the BoD generally comprises five members, two of whom are independent.

### **3.5.2. Conditions at the board level**

The four board-related processes comprised composite scores averaged from multiple items measured on a Likert scale, where 1 = strongly disagree and 5 = strongly agree.

### **3.5.3. Conditions at the organizational level**

The two contingency factors are *firm age*, measured by the number of years since the firm's foundation (Balsmeier et al., 2017; Zona, 2016), and *firm size*, operationalized by the logarithmic transformation of the total number of employees to meet normal distribution.

### **3.5.4. Outcome**

Innovation was represented by internal product/service innovation, which refers to the efforts deployed to innovate in terms of prioritization and R&D investments (inputs) and the fact for these aspects to translate into the introduction of new products/services (outputs) (Bianchi et al., 2016; Hitt et al., 1996; Hoskisson et al., 2002).

### **3.5.5. FsQCA method**

The FsQCA method was used to investigate the relevance of our propositions. This method has recently been employed by several corporate governance studies (Paniagua et al., 2018; Rodrigues et al., 2020; Schiehl et al., 2018) and is particularly appropriate for identifying configurations that include concepts related to the BoD and contingency factors (García-Ramos and Díaz, 2021). Instructions for conducting the analysis were strictly followed (Fiss, 2011; Furnari et al., 2021; Misangyi et al., 2017; Ragin, 2009). Also, according to the latest recommendations, we considered both core and peripheral conditions (Lewellyn and Muller-Kahle, 2020; Park, et al., 2020) and a more restrictive calibration (5th, 50th, and 95th percentiles) (Ponomareva et al., 2022). Finally, in line with our study objective, our

propositions, and recent studies (e.g., Speldekamp et al., 2020; Standaert et al., 2021), we focused on configurations leading to high levels of our outcome.

The constructs' coherence was assessed using exploratory and confirmatory factor analyses (tables 15 and 16) and by verifying composite reliability and convergent validity.

**Table 15.** Constructs' items, loadings, validity, and reliability

Variables	Items	LDG	$\lambda$	$\alpha$	AVE	CR
<i>Board-related processes</i>						
<i>Establishment</i>	The establishment of the BoD was based on the following criteria:		2.88	0.82	0.50	0.57
	(1) Follow industry best practices	0.80				
	(2) Facilitate access to expertise	0.51				
	(3) Support the strategic development of the firm	0.62				
	(4) Provide the company with greater credibility	0.84				
<i>Integration</i>	The integration of directors included the following measures:		2.11	0.70	0.52	0.61
	(1) Orientation	0.70				
	(2) Incitation	0.68				
	(3) Evaluation	0.78				
<i>Centralization</i>	The centralization within the BoD was assessed by the following:		1.94	0.66	0.57	0.84
	(1) The general manager is also the main owner	0.80				
	(2) The firm is a family enterprise	0.71				
	(3) The board mainly comprises internal directors	0.74				
	(4) The CEO is also the board chairman	0.77				
<i>Bureaucracy</i>	The bureaucracy within the BoD was assessed based on the following:		1.78	0.65	0.53	0.77
	(1) The board is a cumbersome process to support	0.77				
	(2) The board is too involved in micromanagement and not in strategy	0.66				
	(3) The board limits the autonomy and decision-making's independence	0.74				
<i>Contingency factors</i>						
<i>Firm size</i>	The natural logarithm of the total number of employees	-	-	-	-	-
<i>Firm age</i>	The number of years the organization has existed	-	-	-	-	-
<i>Innovation</i>						
<i>Internal product/service</i>	Innovation was measured according to the degree to which SMEs:		1.80	0.72	0.51	0.73
	(1) Consider innovation a primary objective	0.58				
	(2) Invest in R&D compared to their main competitors	0.89				
	(3) Introduce products/services compared to their main competitors	0.69				

**Table 16.** Fit of the factorial model

$\chi^2/df$	<i>p-value</i>	<i>TLI</i>	<i>NFI</i>	<i>CFI</i>	<i>RMSEA</i>	<i>PCLOSE</i>
1,27	0.06	0.90	0.92	0.93	0.04	0,35

The descriptive statistics and calibration are presented in table 17 while table 18 illustrates the correlation matrix.

**Table 17.** Descriptive statistics and calibration

<b>Statistics</b> <b>Variables</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>5th pctl</b>	<b>50th pctl</b>	<b>95th pctl</b>
<i>Board-related establishment process</i>	3,57	0,97	1,00	5,00	1,53	3,70	5,00
<i>Board-related integration process</i>	1,66	0,31	1,00	2,00	1,00	1,67	2,00
<i>Board-related centralization process</i>	1,21	0,22	0,80	1,80	1,00	1,20	1,60
<i>Board-related bureaucratic process</i>	2,21	0,84	1,00	4,00	1,00	2,33	3,67
<i>Firm size (natural logarithm)</i>	3,90	0,71	3,00	5,50	3,00	3,91	5,33
<i>Firm age (raw values)</i>	40,50	22,07	5,00	130,00	8,70	36,00	82,4
<i>Innovation (internal product/service)</i>	3,45	0,75	1,30	5,00	2,33	3,33	4,67

**Table 18.** Correlation matrix (Pearson)

	1	2	3	4	5	6	7
1	1,00						
2	-0,27**	1,00					
3	0,01	-0,02	1,00				
4	0,15	-0,06	0,02	1,00			
5	0,05	-0,12	0,13	-0,13	1,00		
6	0,22*	-0,05	-0,01	-0,02	0,24*	1,00	
7	0,16	-0,31**	-0,13	-0,04	0,08	0,10	1,00

**Significance** (two-tailed): \* P <0.05; \*\* P <0.01.

**Board variables** (board-related process): 1. Establishment; 2. Integration; 3. Centralization; 4. Bureaucratic.

**Organizational variables** (contingency factors): 5. Firm size; 6. Firm age.

**Innovation variable:** 7. Internal product/service.

### 3.6. Analysis and Results

#### 3.6.1. Analysis of necessary conditions

The first step was to analyze the necessary conditions. The norm is to consider a condition necessary when its consistency value is greater than 0.90 (García-Ramos and Díaz, 2021; Rodrigues et al., 2020; Schiehl et al., 2018).

As shown in Table 19, none of the variables met this criterion, indicating that there are no necessary conditions at the board or organizational level leading to high levels of innovation.

**Table 19.** Necessary conditions analysis for the presence of innovation

<b>Conditions</b>	<b>Consistency</b>	<b>Coverage</b>
<i>Board-related establishment process</i>	0.71	0.70
<i>~ Board-related establishment process</i>	0.57	0.63
<i>Board-related integration process</i>	0.62	0.58
<i>~ Board-related integration process</i>	0.64	0.74
<i>Board-related centralization process</i>	0.53	0.63
<i>~ Board-related centralization process</i>	0.70	0.65
<i>Board-related bureaucratic process</i>	0.69	0.66
<i>~ Board-related bureaucratic process</i>	0.57	0.65
<i>Firm size</i>	0.59	0.69
<i>~ Firm size</i>	0.68	0.63
<i>Firm age</i>	0.68	0.71
<i>~ Firm age</i>	0.62	0.65

### 3.6.2. Analysis of overall solution

The results of FsQCA-sufficient conditions (with a raw coverage > 0.20 and a consistency > 0.80) are presented in Table 20. The consistency cutoff was set to 0.81. In total, 10 configurations have been identified as being likely to generate high levels of innovation. The solution consistency value of 0.74 indicates that these configurations led to high levels of innovation 74% of the time. The coverage value of 0.72 indicates that 72% of innovation is

explained by the identified configurations. Table 20 also lists the raw and unique coverage values for each configuration. The first reflects both innovation and the specific configuration; the second refers to the coverage of innovation for each configuration.

**Table 20.** Sufficient configurations leading to high levels of innovation in SMEs

Configurations	<i>High levels of innovation (internal product/service)</i>									
	1	2	3	4	5	6	7	8	9	10
<b>Board-level conditions</b>										
<i>Board-related establishment process</i>	●	●		●	●			●	⊗	●
<i>Board-related integration process</i>		⊗	●	⊗		●	●	●	●	●
<i>Board-related centralization process</i>	⊗		⊗	⊗	⊗	⊗	⊗	⊗	●	⊗
<i>Board-related bureaucratic process</i>		⊗	⊗		⊗	●	⊗		●	
<b>Organizational-level conditions</b>										
<i>Firm size</i>	⊗	⊗	⊗		●	●	⊗	⊗		⊗
<i>Firm age</i>	⊗			⊗	●	●	⊗	⊗	⊗	
Consistency	0.85	0.84	0.81	0.83	0.89	0.87	0.83	0.81	0.81	0.82
Raw coverage	0.36	0.30	0.24	0.27	0.33	0.32	0.23	0.27	0.20	0.34
Unique coverage	0.01	0.04	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.02
Solution consistency	0.74									
Solution coverage	0.72									

Notes: Core conditions are represented by ● (presence) and ⊗ (absence); Peripheral conditions are identified by ● (presence) and ⊗ (absence); Blank spaces indicate a “do not care” situation in which the causal condition may be either present or absent from the configurations.

### 3.6.3. Horizontal analysis of sufficient conditions

Horizontal analysis (i.e., focus on each condition individually across all configurations) supports the relevance of our six propositions. Thus, the presence or absence of each of the four board-related processes and each of the two contingency factors represent important conditions of innovation in SMEs. Table 21 recalls our six propositions and shows how the findings generally validate their pertinence.

**Table 21.** Propositions (theorization) and findings (validation)

Propositions (theorization)	Findings (validation)
<p><i>P1: The board-related establishment process, which translates to the concrete motivations underlying the choice of setting up a BoD and the decision-making process and rationale of such an initiative, is part of the sufficient (present) conditions that lead to high levels of innovation in SMEs.</i></p>	<p>The board-related establishment process proved to be relevant overall, given that the presence of this condition has been observed in six (1, 2, 4, 5, 8 and 10) and its absence in one (9) of the 10 configurations that lead to high levels of innovation in SMEs.</p>
<p><i>P2: The board-related integration process, which translates to the orientation, incitation, and evaluation of the BoD, is part of the sufficient (present) conditions that lead to high levels of innovation in SMEs.</i></p>	<p>The board-related integration process proved to be relevant overall, given that the presence of this condition has been observed in six (3, 6, 7, 8, 9, and 10) and its absence in two (2 and 4) of the 10 configurations that lead to high levels of innovation in SMEs.</p>
<p><i>P3: The board-related centralization process, which translates to the concentration of power, decision-making, and ownership within the BoD, is part of the sufficient (absent) conditions that lead to high levels of innovation in SMEs.</i></p>	<p>The board-related centralization process proved to be relevant overall, given that the absence of this condition has been observed in six (1, 3, 4, 5, 6, 7, 8 and 10) and its presence in one (9) of the 10 configurations that lead to high levels of innovation in SMEs.</p>
<p><i>P4: The board-related bureaucratic process, which translates to the potential cumbersomeness, rigidity, and limited strategic scope of the BoD, is part of the sufficient (absent) conditions that lead to high levels of innovation in SMEs.</i></p>	<p>The board-related bureaucratic process proved to be relevant overall, given that the absence of this condition has been observed in four (2, 3, 5 and 7) and its presence in two (6 and 9) of the 10 configurations that lead to high levels of innovation in SMEs.</p>
<p><i>P5: Firm size is part of the sufficient (present or absent) conditions that lead to high levels of innovation in SMEs.</i></p>	<p>Firm size proved to be relevant, given that the presence of this condition has been observed in two (5 and 6) and its absence in six (1, 2, 3, 7, 8 and 10) of the 10 configurations that lead to high levels of innovation in SMEs.</p>
<p><i>P6: Firm age is part of the sufficient (present or absent) condition that leads to high levels of innovation in SMEs.</i></p>	<p>Firm age proved to be relevant, given that the presence of this condition has been observed in two (5 and 6) and its absence in five (1, 4, 7, 8 and 9) of the 10 configurations that lead to high levels of innovation in SMEs.</p>

### 3.6.4. Vertical analysis of sufficient conditions

Vertical analysis leads to several observations. It appears that the presence of board-related establishment and integration processes is important, which testifies to the scope of processes located more toward the upstream-midstream of the continuum. However, the absence of

centralization and bureaucratic processes was also important, which support the interest of processes located more toward the midstream-downstream of the continuum. In short, when it comes innovation, all levels of the continuum of board-related processes seem relevant. Furthermore, firm size and age mainly stood out by their absence across the various configurations. These two organizational-level conditions show certain trends depending on SMEs' bi-dimensional levels of growth. More specifically, relatively smaller and younger SMEs show the presence of either an establishment or an integration process and the absence of either a centralization or bureaucratic process. For their part, relatively larger and older SMEs show the presence of either an establishment or an integration process and the absence of a centralization process and either the absence (in the presence of an establishment process) or presence (in the presence of an integration process) of a bureaucratic process. These findings also suggest both substitution and complementarity effects. Overall, the results are consistent with the assumptions underlying the continuum logic, the configurational approach, and the contingency perspective. Table 22 illustrates how these different assumptions are supported by the findings.

**Table 22.** Assumptions (theorization) and findings (validation)

<b>Assumptions (theorization)</b>	<b>Findings (validation)</b>
<i>Continuum logic</i>	Configurations illustrate that the presence or absence of upstream, midstream, and downstream board-related processes are relevant to explain innovation in SMEs.
<i>Conjunction</i>	Innovation in SMEs cannot be explained by a single condition and is the result of the interdependence between different conditions, as each of the configurations includes at least four conditions.
<i>Equifinality</i>	Multiple pathways lead to innovation in SMEs as different combinations of conditions are involved to explain this specific organizational outcome.
<i>Asymmetry</i>	The same conditions have been shown to be able to contribute differently or sometimes even simply be unrelated to innovation in SMEs.
<i>Contingency</i>	All configurations include at least one contingency factor, which suggest that the BoD is not omnipotent regarding innovation in SMEs and underlines the relevance of firms' environment.



### **3.7. Discussion and conclusion**

This study primarily aimed to investigate the link between board-related processes and innovation in the context of SMEs. We articulated our approach around a continuum logic through a configurational approach from a contingency perspective. This has allowed us to theorize four original board-related processes, which operates upstream, midstream, and downstream. We have also identified 10 configurations that include board-related processes and contingency factors, leading to high levels of innovation in SMEs. Our approach gives rise to major observations that are useful scientifically and practically. Indeed, this paper goes beyond traditional theories, current empirical evidence, and conventional good practices in corporate governance. It also contains various concrete recommendations to managers and policymakers to help SMEs strive for higher levels of innovation.

#### **3.7.1. Implications for research**

This study theorizes four original board-related processes by combining underlying elements of various boards attributes based on an extensive literature and the postulates of various complementary theories. Thus, it confirms the strategic scope of the BoD (Arzubiaga et al., 2018; Puthusserry et al., 2021) by introducing four new relevant parameters that can spur innovation in SMEs. Therefore, we answer the repeated calls to document board processes (Federo et al., 2020; Forbes and Milliken, 1999; Kumar and Zattoni, 2019; Pettigrew, 1992; Uhlaner et al., 2021; Zattoni et al., 2015) and provide much-needed alternatives to the focus on boards' structure (Kurzahls et al., 2020; Sierra-Morán et al., 2021). These facts take on all their importance knowing that studies on the BoD (Balsmeier et al., 2017; Pearce II and Patel, 2018) and good practices in corporate governance are often articulated around board composition (Mutlu et al., 2018; Witt et al., 2022). However, board structure is not sufficient to explain organizational performance (Johnson et al., 1996; Pearce II and Patel, 2018) and even less innovation, given the inherent complexity in this specific organizational outcome (Davis and Bendickson, 2021; McCann and Bahl, 2017).

This paper also introduces a continuum logic associated with board-related processes. Thus, it reveals that the impact of the BoD on innovation in SMEs depends on certain processes that occur at different times: upstream, midstream, and downstream. This theorization, which has been supported empirically, enriches the available conclusions available to date, that are

mainly rooted in midstream-level analyses. It allows to provide a singular comprehension of how the link between the BoD and innovation operates. Furthermore, it confirms that the BoD is a valuable resource through its human and social capital (Barroso-Castro et al., 2022; Purkayastha et al., 2021), both of which can stimulate innovation in SMEs and find their essence in resource-based theory (Barney, 1991) and resource dependency theory (Pfeffer and Salancik, 2003), respectively. Our theorization around the continuum logic underlying board-related processes is also in line with stakeholders' theory, which stipulates that the BoD following rigorous processes can generate value creation and innovation because it can help firms manage and balance their relationships (Chen and Liu, 2020; Freeman, 1984; Wu, 2008).

This research, through its configurational approach, also allows us to rethink the link between the BoD and innovation. Indeed, it shows that complementary relationships between various board-related processes and organizational characteristics are involved to explain innovation in SMEs. This suggests that innovation is not attributable to isolated factors (i.e., conjunction), that the same concept could contribute differently or be irrelevant to innovation (i.e., asymmetry) and that different combinations of elements can lead to innovation (i.e., equifinality). Thus, our findings are in line with complexity theory (García-Ramos and Díaz, 2021; Kauffman, 1993; Misangyi et al., 2017) and provide a fine-grained understanding of the potential impact of the BoD on innovation.

Furthermore, by integrating a contingency perspective, this study also allows for a nuanced view that ultimately provides a more complete picture of the link between the BoD and innovation in SMEs. It suggests that SMEs' bi-dimensional level of growth is of paramount importance, given that it implies variations in the combinations of board-related processes involved to spur innovation. Thus, in accordance with contingency theory (Burns and Stalker, 1962; Csaszar and Ostler, 2020) and the relevance of environmental factors to explain innovation (Morgan and Anokhin, 2020; Wu and Wu, 2014), we highlight that the BoD is not impermeable to its environment. This makes it possible to be in line with the need to extend the conceptual framework beyond the BoD when analyzing the potential contributions of this governance body (García-Ramos and Díaz, 2021; Puthusserry et al., 2021; Tasheva and Hillman, 2019). Similarly, by showing that SMEs' bi-dimensional level of growth is a

crucial parameter, we also corroborate the pertinence of considering precisely firm size and age when the goal is to investigate the BoD's impact on innovation (Arzubiaga et al., 2018; Miller and Triana, 2009; Zona et al., 2013). In short, the BoD can benefit SMEs, but it is not omnipotent to innovate, which reaffirms the need of adopting a holistic approach when analyzing innovation as an outcome (Dewangan and Godse, 2014; Edquist, 2019).

### **3.7.2. Implications for practitioners**

While there has been a trend towards collaborative approaches to innovation over the past few years, our results show that some viable options within organizational boundaries, in this case through the BoD, may not have been fully exploited. This suggests that organizations should ensure that they are making the most out of their internal resources, particularly through the judicious use of their BoD, before or at least in parallel to relying on external resources to innovate. Therefore, these aspects show that SMEs that do not have a BoD would benefit from establishing one. By referring to the underlying elements of the board-related establishment process, they will find concrete factors to guide them to this end.

Regarding SMEs' size and age, results suggest they are indeed important to spur innovation (Hervas-Oliver et al., 2021; Leyva-de la Hiz and Bolívar-Ramos, 2021). More precisely, board-related processes should be adapted to these two contingency factors to create optimal conditions for innovation. In other words, the 10 configurations represent 10 promising paths to innovation translating into combinations between four board-related processes that SMEs can follow based on their bi-dimensional level of growth. Thus, depending on their size or age or both simultaneously, SMEs will find in these configurations concrete courses of actions articulated around our board-related processes, and more specifically, their 14 underlying items, to foster innovation.

Moreover, initiatives aimed at spurring innovation in SMEs generally comprise monetary incentives taking various forms and focusing on R&D. However, this study suggests that financial support specifically targeting the improvement of governance practices at the board level could be a promising alternative to these more traditional governmental measures, which have often proved to be somewhat sterile (Hervás-Oliver et al., 2021; Yi et al., 2021). Thus, specific grants programs could be intended to cover the costs of training in governance

for the directors of SMEs. In this continuity, organizations whose mission is to train directors could develop and implement content around our different board-related processes to optimize the contributions of directors to innovation.

Finally, while good practice guides in corporate governance mainly focus on structural characteristics of the BoD in large organizations, our results point to two initiatives that could have a considerable impact on governance practices, SMEs, and innovation. The first refers to the need to address board-related processes in future releases of good practices guides by following a continuum logic (i.e., by considering that distinct processes are involved at different times), through a configurational approach (i.e., by emphasizing that processes operate in tandem and not in isolation) and from a contingency perspective (i.e., by adopting a holistic view of processes that attaches more importance to environmental factors). The second step concerns the necessity to write good practice guides integrating the specificities of SMEs, which are numerous (Forbes and Milliken, 1999; Li et al., 2020; Zahra et al., 2007).

### **3.7.3. Limitations and avenues for future research**

The four board-related processes are all original, which induces that there is no consensus regarding their measurements. This is consistent with the exploratory nature of this study, although the approach was duly supported by the literature and rigorous statistical tests. In this sense, the analyzed constructs are partial and may be enriched by other items. Future studies could focus on the operationalization of board-related processes to develop even more robust constructs and results.

Moreover, focusing on a specific type of innovation deprives this study of interesting comparisons that could have been made if other types of innovation or a collaborative approach to innovation were included in the analysis. Scholars would benefit from looking into these aspects as it would reveal if the effects of the analyzed board-related processes and contingency factors vary depending on the many derivatives of innovation.

Additionally, the complementarity between our four board-related processes and two contingency factors suggests that by omitting other board and organizational characteristics, we may have missed several relevant configurations. The literature could place more emphasis on other environmental considerations (e.g., sectoral effects) and regard other

board attributes (e.g., roles) for an in-depth and holistic understanding of the link between the BoD and innovation in SMEs. This could even lead to the identification of typologies of innovative SMEs based on two axes: BoD and organizational characteristics.

Furthermore, a purely qualitative approach to studying board-related processes might be preferable, given that these concepts mainly refer to behavioral aspects. The analyzed board-related processes comprise underlying elements of certain board attributes that cannot be fully captured through statistical constructs. Their live observation or at least their analysis via interviews are approaches that would have more potential to gain even more substantial insights on how they materialize and how they can influence innovation.

Finally, the sample of 300 SMEs, of which 112 were found to have a BoD, despite being superior to several past governance studies based on primary data and published in leading journals, calls for humility regarding the results' interpretation. We emphasize that our findings should be interpreted with caution and that a broader study, even if it represents a monumental challenge given the difficulty in surveying directors and the limited number of SMEs that have a BoD, would be of great added value to aim for a higher degree of generalization.

This study provides a singular understanding of how the BoD can stimulate innovation in SMEs. To this end, it develops a theorization and conducts experimentation of the link between four board-related processes based on a framework that follows a continuum logic through a configurational approach and from a contingency perspective. In this sense, the findings allow to introduce new parameters and rethink the way in which this phenomenon operates and contextualize it. Thus, we contribute to enriching the scientific debate regarding the governance of SMEs, the strategic scope of the BoD, the relevance of board-related processes, and the antecedents of innovation. By the same token, we provide several courses of actions to managers and policymakers to help SMEs strive for higher levels of innovation.

### **3.8. References**

Allemand, I., Bédard, J., Brullebaut, B., & Deschênes, J. (2022). Role of old boys' networks and regulatory approaches in selection processes for female directors. *British Journal of Management*, 33, 784-805.

- Almor, T., Bazel-Shoham, O., & Lee, S. M. (2019). The dual effect of board gender diversity on R&D investments. *Long Range Planning*, 101884.
- Anderson, B. S., & Eshima, Y. (2013). The influence of firm age and intangible resources on the relationship between entrepreneurial orientation and firm growth among Japanese SMEs. *Journal of Business Venturing*, 28, 413-429.
- Anderson, R. C., & Reeb, D. M. (2004). Board composition: Balancing family influence in S&P 500 firms. *Administrative Science Quarterly*, 49, 209-237.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Bammens, Y., Voordeckers, W., & Van Gils, A. (2011). Boards of directors in family businesses: A literature review and research agenda. *International Journal of Management Reviews*, 13, 134-152.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Baum, C. F., Lööf, H., Stephan, A., & Viklund-Ros, I. (2022). Innovation by start-up firms: The role of the board of directors for knowledge spillovers. *Research Policy*, 51, 104375.
- Bauweraerts, J., Pongelli, C., Sciascia, S., Mazzola, P., & Minichilli, A. (2021). Transforming entrepreneurial orientation into performance in family SMEs: are nonfamily CEOs better than family CEOs?. *Journal of Small Business Management*, 1-32.
- Bauweraerts, J., Sciascia, S., Naldi, L., & Mazzola, P. (2019). Family CEO and board service: Turning the tide for export scope in family SMEs. *International Business Review*, 28, 101583.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Bertschi-Michel, A., Sieger, P., & Kammerlander, N. (2021). Succession in family-owned SMEs: the impact of advisors. *Small Business Economics*, 56, 1531-1551.
- Bezemer, P. J., Nicholson, G., & Pugliese, A. (2018). The influence of board chairs on director engagement: A case-based exploration of boardroom decision-making. *Corporate Governance: An International Review*, 26, 219-234.
- Bianchi, M., Croce, A., Dell'Era, C., Di Benedetto, C. A., & Frattini, F. (2016). Organizing for inbound open innovation: how external consultants and a dedicated R&D unit influence product innovation performance. *Journal of Product Innovation Management*, 33, 492-510.
- Blau, P. M. (1960). A theory of social integration. *American Journal of Sociology*, 65, 545-556.
- Blumentritt, T. (2006). The relationship between boards and planning in family businesses. *Family Business Review*, 19, 65-72.

- Bodlaj, M., Kadic-Maglajlic, S., & Vida, I. (2020). Disentangling the impact of different innovation types, financial constraints and geographic diversification on SMEs' export growth. *Journal of Business Research*, 108, 466-475.
- Boivie, S., Bednar, M. K., & Barker, S. B. (2015). Social comparison and reciprocity in director compensation. *Journal of Management*, 41, 1578-1603.
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.
- Borch, O. J., & Huse, M. (1993). Informal strategic networks and the board of directors. *Entrepreneurship Theory and Practice*, 18, 23-36.
- Bouncken, R. B., Ratzmann, M., & Kraus, S. (2021). Anti-aging: How innovation is shaped by firm age and mutual knowledge creation in an alliance. *Journal of Business Research*, 137, 422-429.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Bucheli, M., & Salvaj, E. (2018). Political connections, the liability of foreignness, and legitimacy: A business historical analysis of multinationals' strategies in Chile. *Global Strategy Journal*, 8, 399-420.
- Burns T, Stalker GM. 1961. *The Management of Innovation*. Tavistock Publications: London, UK.
- Bustanza, O. F., Gomes, E., Vendrell-Herrero, F., & Baines, T. (2019). Product–service innovation and performance: the role of collaborative partnerships and R&D intensity. *R&D Management*, 49, 33-45.
- Camisón-Zornoza, C., Lapedra-Alcamí, R., Segarra-Ciprés, M., & Boronat-Navarro, M. (2004). A meta-analysis of innovation and organizational size. *Organization Studies*, 25, 331-361.
- Chen, I. J., Hsu, P. H., & Wang, Y. (2022). Staggered boards and product innovations: Evidence from Massachusetts State Bill HB 5640. *Research Policy*, 51, 104475.
- Chen, J., & Liu, L. (2020). Customer participation, and green product innovation in SMEs: The mediating role of opportunity recognition and exploitation. *Journal of Business Research*, 119, 151-162.
- Cheng, L., Xie, E., Fang, J., & Mei, N. (2022). Performance feedback and firms' relative strategic emphasis: The moderating effects of board independence and media coverage. *Journal of Business Research*, 139, 218-231.
- Chester Goduscheit, R., & Faullant, R. (2018). Paths toward radical service innovation in manufacturing companies—a service-dominant logic perspective. *Journal of Product Innovation Management*, 35, 701-719.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128-152.
- Cravens, K., & Wallace, W. (2001). A framework for determining the influence of the corporate board of directors in accounting studies. *Corporate Governance: An International Review*, 9, 2-24.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47, 1154-1191.

- Csaszar, F. A., & Ostler, J. (2020). A contingency theory of representational complexity in organizations. *Organization Science*, 31, 1198-1219.
- Curado, C., Muñoz-Pascual, L., & Galende, J. (2018). Antecedents to innovation performance in SMEs: A mixed methods approach. *Journal of Business Research*, 89, 206-215.
- Dah, M. A., & Frye, M. B. (2017). Is board compensation excessive?. *Journal of Corporate Finance*, 45, 566-585.
- Dalton, C. M., & Dalton, D. R. (2005). In defense of the individual: the CEO as board chairperson. *Journal of Business Strategy*, 26, 8-10.
- Dalton, C. M., & Dalton, D. R. (2006). Corporate governance best practices: the proof is in the process. *Journal of Business Strategy*, 27, 5-8.
- Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal*, 19, 269-290.
- Damanpour, F. (1992). Organizational size and innovation. *Organization Studies*, 13, 375-402.
- Damanpour, F., Sanchez-Henriquez, F., & Chiu, H. H. (2018). Internal and external sources and the adoption of innovations in organizations. *British Journal of Management*, 29, 712-730.
- Dasilas, A., & Papasyriopoulos, N. (2015). Corporate governance, credit ratings and the capital structure of Greek SME and large listed firms. *Small Business Economics*, 45, 215-244.
- Davis, P. E., & Bendickson, J. S. (2021). Strategic antecedents of innovation: Variance between small and large firms. *Journal of Small Business Management*, 59, 47-72.
- Deb, P., & Wiklund, J. (2017). The effects of CEO founder status and stock ownership on entrepreneurial orientation in small firms. *Journal of Small Business Management*, 55, 32-55.
- Del Brío, J. Á., & Junquera, B. (2003). A review of the literature on environmental innovation management in SMEs: implications for public policies. *Technovation*, 23, 939-948.
- Deschamps, J. P., & Nelson, B. (2014). *Innovation governance: How top management organizes and mobilizes for innovation*. John Wiley & Sons.
- Deutsch, Y. (2007). The influence of outside directors' stock-option compensation on firms' R&D. *Corporate Governance: An International Review*, 15, 816-827.
- Dewangan, V., & Godse, M. (2014). Towards a holistic enterprise innovation performance measurement system. *Technovation*, 34, 536-545.
- Díaz-Díaz, N. L., López-Iturriaga, F. J., & Santana-Martín, D. J. (2022). The role of political ties and political uncertainty in corporate innovation. *Long Range Planning*, 55, 102111.
- Ding, W. W., Murray, F., & Stuart, T. E. (2013). From bench to board: Gender differences in university scientists' participation in corporate scientific advisory boards. *Academy of Management Journal*, 56, 1443-1464.
- Doucouliafos, H., Haman, J., & Askary, S. (2007). Directors' remuneration and performance in Australian banking. *Corporate governance: An International Review*, 15, 1363-1383.
- Drymiotis, G., & Sivaramakrishnan, K. (2021). Strategic director appointments. *Journal of Accounting Research*, 59, 1303-1347.



- Edquist, C. (2019). Towards a holistic innovation policy: Can the Swedish National Innovation Council (NIC) be a role model?. *Research Policy*, 48, 869-879.
- Ejdemo, T., & Örtqvist, D. (2020). Related variety as a driver of regional innovation and entrepreneurship: A moderated and mediated model with non-linear effects. *Research Policy*, 49, 104073.
- Elms, N., & Pugliese, A. (2022). Director tenure and contribution to board task performance: A time and contingency perspective. *Long Range Planning*, 102217.
- Engel, P. J., Hack, A., Stanley, L. J., & Kellermanns, F. W. (2019). Voluntary disclosure of individual supervisory board compensation in public family firms. *Journal of Business Research*, 101, 362-374.
- Enkel, E., Groemminger, A., & Heil, S. (2018). Managing technological distance in internal and external collaborations: absorptive capacity routines and social integration for innovation. *The Journal of Technology Transfer*, 43, 1257-1290.
- Farrell, K. A., Friesen, G. C., & Hersch, P. L. (2008). How do firms adjust director compensation?. *Journal of Corporate Finance*, 14, 153-162.
- Fedaseyeu, V., Linck, J. S., & Wagner, H. F. (2018). Do qualifications matter? New evidence on board functions and director compensation. *Journal of Corporate Finance*, 48, 816-839.
- Federo, R., Ponomareva, Y., Aguilera, R. V., Saz-Carranza, A., & Losada, C. (2020). Bringing owners back on board: A review of the role of ownership type in board governance. *Corporate Governance: An International Review*, 28, 348-371.
- Fiegenger, M. K., Brown, B. M., Dreux IV, D. R., & Dennis Jr, W. J. (2000). CEO stakes and board composition in small private firms. *Entrepreneurship Theory and Practice*, 24, 5-24.
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54, 393-420.
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- Foucart, R., & Li, Q. C. (2021). The role of technology standards in product innovation: Theory and evidence from UK manufacturing firms. *Research Policy*, 50, 104157.
- Freeman, R. E. 1984. *Strategic Management: A Stakeholder Approach*, Boston: Pitman Publishing Inc.
- Furnari, S., Crilly, D., Misangyi, V. F., Greckhamer, T., Fiss, P. C., & Aguilera, R. V. (2021). Capturing causal complexity: Heuristics for configurational theorizing. *Academy of Management Review*, 46, 778-799.
- Gai, S. L., Cheng, J. Y. J., & Wu, A. (2021). Board design and governance failures at peer firms. *Strategic Management Journal*, 42, 1909-1938.
- García-Ramos, R., & Díaz, B. D. (2021). Board of directors structure and firm financial performance: A qualitative comparative analysis. *Long Range Planning*, 54, 102017.
- Garg, S., & Eisenhardt, K. M. (2017). Unpacking the CEO–board relationship: How strategy making happens in entrepreneurial firms. *Academy of Management Journal*, 60, 1828-1858.
- Garg, S., John Li, Q., & Shaw, J. D. (2019). Entrepreneurial firms grow up: Board undervaluation, board evolution, and firm performance in newly public firms. *Strategic Management Journal*, 40, 1882-1907.

- Gentile-Lüdecke, S., Torres de Oliveira, R., & Paul, J. (2020). Does organizational structure facilitate inbound and outbound open innovation in SMEs?. *Small Business Economics*, 55, 1091-1112.
- Gentile-Lüdecke, S., Torres de Oliveira, R., & Paul, J. (2020). Does organizational structure facilitate inbound and outbound open innovation in SMEs?. *Small Business Economics*, 55, 1091-1112.
- Gimenez-Fernandez, E. M., Sandulli, F. D., & Bogers, M. (2020). Unpacking liabilities of newness and smallness in innovative start-ups: Investigating the differences in innovation performance between new and older small firms. *Research Policy*, 49, 104049.
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Griffin, D., Li, K., & Xu, T. (2021). Board gender diversity and corporate innovation: International evidence. *Journal of Financial and Quantitative Analysis*, 56, 123-154.
- Guldiken, O., Mallon, M. R., Fainshmidt, S., Judge, W. Q., & Clark, C. E. (2019). Beyond tokenism: How strategic leaders influence more meaningful gender diversity on boards of directors. *Strategic Management Journal*, 40, 2024-2046.
- Haneda, S., & Ito, K. (2018). Organizational and human resource management and innovation: which management practices are linked to product and/or process innovation?. *Research Policy*, 47, 194-208.
- Heracleous, L. (2001). What is the impact of corporate governance on organisational performance?. *Corporate governance: An International Review*, 9, 165-173.
- Herrmann, P., & Nadkarni, S. (2014). Managing strategic change: The duality of CEO personality. *Strategic Management Journal*, 35, 1318-1342.
- Hervás-Oliver, J. L., Parrilli, M. D., Rodríguez-Pose, A., & Sempere-Ripoll, F. (2021). The drivers of SME innovation in the regions of the EU. *Research Policy*, 50, 104316.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28(3), 383-396.
- Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal*, 39, 1084-1119.
- Hoppmann, J., Naegele, F., & Girod, B. (2019). Boards as a source of inertia: Examining the internal challenges and dynamics of boards of directors in times of environmental discontinuities. *Academy of Management Journal*, 62, 437-468.
- Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Grossman, W. (2002). Conflicting voices: The effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, 45, 697-716.
- Hsu, W. T., Chen, H. L., & Cheng, C. Y. (2013). Internationalization and firm performance of SMEs: The moderating effects of CEO attributes. *Journal of World Business*, 48, 1-12.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Ingle, C., Khlif, W., & Karoui, L. (2017). SME growth trajectories, transitions and board role portfolios: A critical review and integrative model. *International Small Business Journal*, 35, 729-750.

- Ingle, C., & Van Der Walt, N. (2005). Do board processes influence director and board performance? Statutory and performance implications. *Corporate Governance: An International Review*, 13, 632-653.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Judge Jr, W. Q., & Zeithaml, C. P. (1992). Institutional and strategic choice perspectives on board involvement in the strategic decision process. *Academy of Management Journal*, 35, 766-794.
- Kaczmarek, S., & B Nyuur, R. (2021). The implications of board nationality and gender diversity: evidence from a qualitative comparative analysis. *Journal of Management and Governance*, 1-27.
- Kang, Y., Zhao, C., & Battisti, M. (2022). Organizational learning in SMEs' internationalization: A moderated mediating effect of absorptive capacity. *Long Range Planning*, 102220.
- Kauffman, S. A. (1993). *The origins of order: Self-organization and selection in evolution*. Oxford University Press, USA.
- Kim, Y., & Cannella Jr, A. A. (2008). Toward a social capital theory of director selection. *Corporate Governance: An International Review*, 16(4), 282-293.
- Klarner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Kleinknecht, A. (1989). Firm size and innovation. *Small Business Economics*, 1, 215-222.
- Kosnik, R. D. (1990). Effects of board demography and directors' incentives on corporate greenmail decisions. *Academy of Management Journal*, 33, 129-150.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Leblanc, R., & Schwartz, M. S. (2007). The black box of board process: Gaining access to a difficult subject. *Corporate Governance: An International Review*, 15, 843-851.
- Lee, H., Kelley, D., Lee, J., & Lee, S. (2012). SME survival: The impact of internationalization, technology resources, and alliances. *Journal of Small Business Management*, 50, 1-19.
- Lee, S. H., & Phan, P. (2000). Competencies of Directors in Global Firms: requirements for recruitment and evaluation. *Corporate Governance: An International Review*, 8, 204-214.
- Lewellyn, K. B., & Muller-Kahle, M. I. (2020). The corporate board glass ceiling: The role of empowerment and culture in shaping board gender diversity. *Journal of Business Ethics*, 165, 329-346.
- Leyva-De la Hiz, D. I., & Bolívar-Ramos, M. T. (2022). The inverted U relationship between green innovative activities and firms' market-based performance: The impact of firm age. *Technovation*, 110, 102372.
- Li, H., Terjesen, S., & Umans, T. (2020). Corporate governance in entrepreneurial firms: a systematic review and research agenda. *Small Business Economics*, 54, 43-74.

- Lim, E. N., & McCann, B. T. (2014). Performance feedback and firm risk taking: The moderating effects of CEO and outside director stock options. *Organization Science*, 25, 262-282.
- Lioukas, C. S., & Reuer, J. J. (2020). Choosing between safeguards: Scope and governance decisions in R&D alliances. *Journal of Management*, 46, 359-384.
- López, A., Neves, P., & Cunha, M. (2019). A high-growth firm contingency test of the formalization-performance relationship. *Journal of Small Business Management*, 57, 374-396.
- Luciano, M. M., Nahrgang, J. D., & Shropshire, C. (2020). Strategic leadership systems: Viewing top management teams and boards of directors from a multiteam systems perspective. *Academy of Management Review*, 45, 675-701.
- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Ma, S., Kor, Y. Y., & Seidl, D. (2020). CEO advice seeking: An integrative framework and future research agenda. *Journal of Management*, 46, 771-805.
- Mabenge, B. K., Ngorora-Madzimure, G. P. K., & Makanyeza, C. (2020). Dimensions of innovation and their effects on the performance of small and medium enterprises: The moderating role of firm's age and size. *Journal of Small Business & Entrepreneurship*, 4, 1-25.
- Machold, S., Huse, M., Minichilli, A., & Nordqvist, M. (2011). Board leadership and strategy involvement in small firms: A team production approach. *Corporate Governance: An International Review*, 19, 368-383.
- Martin, W. L., McKelvie, A., & Lumpkin, G. T. (2016). Centralization and delegation practices in family versus non-family SMEs: A Rasch analysis. *Small Business Economics*, 47, 755-769.
- McCann, B. T., & Bahl, M. (2017). The influence of competition from informal firms on new product development. *Strategic Management Journal*, 38, 1518-1535.
- McKiernan, P., & Morris, C. (1994). Strategic planning and financial performance in UK SMEs: does formality matter?. *British Journal of Management*, 5, S31-S41.
- McGahan, A. M., Bogers, M. L., Chesbrough, H., & Holgersson, M. (2021). Tackling societal challenges with open innovation. *California Management Review*, 63, 49-61.
- McNulty, T., & Pettigrew, A. (1999). Strategists on the board. *Organization Studies*, 20, 47-74.
- Meyer, C. B., & Altenborg, E. (2007). The disintegrating effects of equality: A study of a failed international merger. *British Journal of Management*, 18, 257-271.
- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity-firm performance relationship. *Journal of Management Studies*, 46, 755-786.
- Minichilli, A., Gabriellson, J., & Huse, M. (2007). Board evaluations: Making a fit between the purpose and the system. *Corporate Governance: An International Review*, 15, 609-622.
- Minichilli, A., Zattoni, A., Nielsen, S., & Huse, M. (2012). Board task performance: An exploration of micro-and macro-level determinants of board effectiveness. *Journal of Organizational Behavior*, 33, 193-215.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.

- Miroshnychenko, I., Strobl, A., Matzler, K., & De Massis, A. (2021). Absorptive capacity, strategic flexibility, and business model innovation: Empirical evidence from Italian SMEs. *Journal of Business Research*, 130, 670-682.
- Misangyi, V. F., Greckhamer, T., Furnari, S., Fiss, P. C., Crilly, D., & Aguilera, R. (2017). Embracing causal complexity: The emergence of a neo-configurational perspective. *Journal of Management*, 43, 255-282.
- Morgan, T., & Anokhin, S. A. (2020). The joint impact of entrepreneurial orientation and market orientation in new product development: Studying firm and environmental contingencies. *Journal of Business Research*, 113, 129-138.
- Mutlu, C. C., Van Essen, M., Peng, M. W., Saleh, S. F., & Duran, P. (2018). Corporate governance in China: A meta-analysis. *Journal of Management Studies*, 55, 943-979.
- Nag, R., Neville, F., & Dimotakis, N. (2020). CEO scanning behaviors, self-efficacy, and SME innovation and performance: An examination within a declining industry. *Journal of Small Business Management*, 58, 164-199.
- Neville, F., Byron, K., Post, C., & Ward, A. (2019). Board independence and corporate misconduct: A cross-national meta-analysis. *Journal of Management*, 45, 2538-2569.
- Oehmichen, J., Schrapp, S., & Wolff, M. (2017). Who needs experts most? Board industry expertise and strategic change—a contingency perspective. *Strategic Management Journal*, 38, 645-656.
- Okhmatovskiy, I., & David, R. J. (2012). Setting your own standards: Internal corporate governance codes as a response to institutional pressure. *Organization Science*, 23, 155-176.
- OECD (2021). SME and Entrepreneurship Outlook 2021. Disponible à travers le lien suivant : <https://www.oecd.org/publications/oecd-sme-and-entrepreneurship-outlook-2021-97a5bbfe-en.htm>
- Oslo, Manual. 2018. Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation. Paris: OECD Publishing.
- Panayi, E., Bozos, K., & Veronesi, G. (2021). Corporate governance “bundles” and firm acquisitiveness. *Corporate Governance: An International Review*, 29, 402-426.
- Paniagua, J., Rivelles, R., & Sapena, J. (2018). Corporate governance and financial performance: The role of ownership and board structure. *Journal of Business Research*, 89, 229-234.
- Park, Y., Fiss, P. C., & El Sawy, O. A. (2020). Theorizing the multiplicity of digital phenomena: The ecology of configurations, causal recipes, and guidelines for applying QCA. *Management of Information Systems Quarterly*, 44, 1493-1520.
- Parrilli, M. D., Balavac, M., & Radicic, D. (2020). Business innovation modes and their impact on innovation outputs: Regional variations and the nature of innovation across EU regions. *Research Policy*, 49, 104047.
- Pearce II, J. A., & Patel, P. C. (2018). Board of director efficacy and firm performance variability. *Long Range Planning*, 51, 911-926.
- Pedersen, T., & Tallman, S. (2022). Global strategy collections: Emerging market multinational enterprises. *Global Strategy Journal*, 12, 199-208.
- Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, 13, 5-16.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.

- Pfotenhauer, S. M., Juhl, J., & Aarden, E. (2019). Challenging the “deficit model” of innovation: Framing policy issues under the innovation imperative. *Research Policy*, 48, 895-904.
- Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, 93(6), 44-54.
- Preller, R., Patzelt, H., & Breugst, N. (2020). Entrepreneurial visions in founding teams: Conceptualization, emergence, and effects on opportunity development. *Journal of Business Venturing*, 35, 105914.
- Pugliese, A., Nicholson, G., & Bezemer, P. J. (2015). An observational analysis of the impact of board dynamics and directors' participation on perceived board effectiveness. *British Journal of Management*, 26, 1-25.
- Purkayastha, A., Karna, A., Sharma, S., & Bhadra, D. (2021). Board’s human capital resource and internationalization of emerging market firms: Toward an integrated agency–resource dependence perspective. *Journal of Business Research*, 135, 391-407.
- Puthusserry, P., Khan, Z., Nair, S. R., & King, T. (2021). Mitigating psychic distance and enhancing internationalization of fintech SMEs from emerging markets: the role of board of directors. *British Journal of Management*, 32, 1097-1120.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the former CEO stays on board: The role of the predecessor’s board retention for product innovation in family firms. *Journal of Product Innovation Management*, 37, 184-207.
- Raes, A. M., De Jong, S. B., & Bruch, H. (2022). Setting the tone at the top: How the interface processes of organizational climate and non-TMT Managers' leadership transmit TMT cohesion to employees. *Long Range Planning*, 55, 102157.
- Ragin, C. C. (2009). *Redesigning social inquiry: Fuzzy sets and beyond*. University of Chicago Press.
- Randøy, T., & Goel, S. (2003). Ownership structure, founder leadership, and performance in Norwegian SMEs: implications for financing entrepreneurial opportunities. *Journal of Business Venturing*, 18(5), 619-637.
- Rao, P., Kumar, S., Chavan, M., & Lim, W. M. (2021). A systematic literature review on SME financing: Trends and future directions. *Journal of Small Business Management*, 1-31.
- Rasmussen, J. (2015). Do board evaluations measure board effectiveness? The case of large listed companies in Norway. *International Studies of Management & Organization*, 45, 80-98.
- Rasmussen, C. C., Ladegård, G., & Korhonen-Sande, S. (2018). Growth intentions and board composition in high-growth firms. *Journal of Small Business Management*, 56, 601-617.
- Rejeb, H. B., Morel-Guimarães, L., & Boly, V. (2008). Measuring innovation best practices: Improvement of an innovation index integrating threshold and synergy effects. *Technovation*, 28, 838-854.
- Rodrigues, R., Samagaio, A., & Felício, T. (2020). Corporate governance and R&D investment by European listed companies. *Journal of Business Research*, 115, 289-295.
- Rosenstein, J., Bruno, A. V., Bygrave, W. D., & Taylor, N. T. (1993). The CEO, venture capitalists, and the board. *Journal of Business Venturing*, 8, 99-113.

- Schiehll, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Shaikh, I. A., Drira, M., & Hassine, S. B. (2019). What motivates directors to pursue long-term strategic risks? Economic incentives vs. fiduciary duty. *Journal of Business Research*, 101, 218-228.
- Shaikh, I., & Randhawa, K. (2022). Managing the risks and motivations of technology managers in open innovation: Bringing stakeholder-centric corporate governance into focus. *Technovation*, 114, 102437.
- Shearmur, R., & Doloreux, D. (2016). How open innovation processes vary between urban and remote environments: slow innovators, market-sourced information and frequency of interaction. *Entrepreneurship & Regional Development*, 28, 337-357.
- Shefer, D., & Frenkel, A. (2005). R&D, firm size and innovation: an empirical analysis. *Technovation*, 25, 25-32.
- Shehata, N., Salhin, A., & El-Helaly, M. (2017). Board diversity and firm performance: evidence from the UK SMEs. *Applied Economics*, 49(48), 4817-4832.
- Sheikh, M. F., Shah, S. Z. A., & Akbar, S. (2018). Firm performance, corporate governance and executive compensation in Pakistan. *Applied economics*, 50, 2012-2027.
- Schwens, C., Eiche, J., & Kabst, R. (2011). The moderating impact of informal institutional distance and formal institutional risk on SME entry mode choice. *Journal of Management Studies*, 48, 330-351.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly*, 23409444211039856.
- Singh, J. V. (1986). Organizational Legitimacy and the Liability of Newness. *Administrative Science Quarterly*, 31, 171-93.
- Sjödin, D., Parida, V., Jovanovic, M., & Visnjic, I. (2020). Value creation and value capture alignment in business model innovation: A process view on outcome-based business models. *Journal of Product Innovation Management*, 37, 158-183.
- Speldekamp, D., Knobens, J., & Saka-Helmhout, A. (2020). Clusters and firm-level innovation: A configurational analysis of agglomeration, network and institutional advantages in European aerospace. *Research Policy*, 49, 103921.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate board interlocks and new product introductions. *Journal of Marketing*, 82, 132-148.
- Standaert, T., Knockaert, M., & Manigart, S. (2022). Venture capital winners: A configurational approach to high Venture capital-backed firm growth. *British Journal of Management*, 33, 211-230.
- Steckler, E., & Clark, C. (2019). Authenticity and corporate governance. *Journal of Business Ethics*, 155, 951-963.
- Storey, C., Cankurtaran, P., Papastathopoulou, P., & Hultink, E. J. (2016). Success factors for service innovation: A meta-analysis. *Journal of Product Innovation Management*, 33, 527-548.
- Strese, S., Keller, M., Flatten, T. C., & Brettel, M. (2018). CEOs' passion for inventing and radical innovations in SMEs: The moderating effect of shared vision. *Journal of Small Business Management*, 56, 435-452.
- Tang, J., Tang, Z., & Cowden, B. J. (2017). Exploring the relationship between entrepreneurial orientation, CEO dual values, and SME performance in state-owned

- vs. nonstate-owned enterprises in China. *Entrepreneurship Theory and Practice*, 41, 883-908.
- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58, 13-35.
- Terziovski, M. (2010). Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: a resource-based view. *Strategic Management Journal*, 31, 892-902.
- Torres de Oliveira, R., Sahasranamam, S., Figueira, S., & Paul, J. (2020). Upgrading without formal integration in M&A: The role of social integration. *Global Strategy Journal*, 10, 619-652.
- Uhlener, L., Massis, A. D., Jorissen, A., & Du, Y. (2021). Are outside directors on the small and medium-sized enterprise board always beneficial? Disclosure of firm-specific information in board-management relations as the missing mechanism. *Human Relations*, 74, 1781-1819.
- Valentim, L., Lisboa, J. V., & Franco, M. (2016). Knowledge management practices and absorptive capacity in small and medium-sized enterprises: is there really a linkage?. *R&D Management*, 46, 711-725.
- Vandebeek, A., Voordeckers, W., Huybrechts, J., & Lambrechts, F. (2021). Corporate performance and CEO dismissal: The role of social category faultlines. *Corporate Governance: An International Review*, 29, 436-460.
- Vandebeek, A., Voordeckers, W., Lambrechts, F., & Huybrechts, J. (2016). Board role performance and faultlines in family firms: The moderating role of formal board evaluation. *Journal of Family Business Strategy*, 7, 249-259.
- Van den Heuvel, J., Van Gils, A., & Voordeckers, W. (2006). Board roles in small and medium-sized family businesses: Performance and importance. *Corporate Governance: An International Review*, 14, 467-485.
- Vendrell-Herrero, F., Gomes, E., Bustinza, O. F., & Mellahi, K. (2018). Uncovering the role of cross-border strategic alliances and expertise decision centralization in enhancing product-service innovation in MMNEs. *International Business Review*, 27, 814-825.
- Voordeckers, W., Van Gils, A., & Van den Heuvel, J. (2007). Board composition in small and medium-sized family firms. *Journal of Small Business Management*, 45, 137-156.
- Wakasugi, R., & Koyata, F. (1997). R&D, firm size and innovation outputs: are Japanese firms efficient in product development?. *Journal of Product Innovation Management*, 14, 383-392.
- West, J., & Bogers, M. (2014). Leveraging external sources of innovation: a review of research on open innovation. *Journal of Product Innovation Management*, 31, 814-831.
- Westphal, J. D., & Zajac, E. J. (1995). Who shall govern? CEO/board power, demographic similarity, and new director selection. *Administrative Science Quarterly*, 40, 60-83.
- Williamson, O. E. (1991). Strategizing, economizing, and economic organization. *Strategic Management Journal*, 12, 75-94.
- Wincent, J., Anokhin, S., & Örtqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME networks. *Journal of Business Research*, 63, 265-275.



- Witt, M. A., Fainshmidt, S., & Aguilera, R. V. (2022). Our board, our rules: Nonconformity to global corporate governance norms. *Administrative Science Quarterly*, 67, 131-166.
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yi, J., Murphree, M., Meng, S., & Li, S. (2021). The more the merrier? Chinese government R&D subsidies, dependence, and firm innovation performance. *Journal of Product Innovation Management*, 38, 289-310.
- Yildirim-Öktem, Ö., & Üsdiken, B. (2010). Contingencies versus external pressure: professionalization in boards of firms affiliated to family business groups in late-industrializing countries. *British Journal of Management*, 21, 115-130.
- Zahra, S. A., & Filatotchev, I. (2004). Governance of the entrepreneurial threshold firm: A knowledge-based perspective. *Journal of Management Studies*, 41, 885-897.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., Neubaum, D. O., & Naldi, L. (2007). The effects of ownership and governance on SMEs' international knowledge-based resources. *Small Business Economics*, 29, 309-327.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zhu, H., Wang, P., & Bart, C. (2016). Board processes, board strategic involvement, and organizational performance in for-profit and non-profit organizations. *Journal of Business Ethics*, 136, 311-328.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24, 299-315.

# Conclusion générale

## Rappel de l'objectif général et des trois objectifs spécifiques

Cette thèse doctorale a été articulée autour d'un objectif général, qui consiste à mieux appréhender le lien entre le CA et l'innovation, particulièrement dans le contexte des PME. Pour cela, il a fallu poursuivre trois objectifs plus spécifiques, qui ont permis de couvrir théoriquement et empiriquement les principales dimensions du CA (c.-à-d. composition, rôles, efficacité et processus). Leur rappel et leur atteinte sont illustrés dans le tableau 23.

**Tableau 23.** Rappel et atteinte des principaux objectifs de cette thèse doctorale

---

<b>Objectif général de la thèse doctorale</b>	
Tendre vers une compréhension substantielle du lien entre le CA et l'innovation, particulièrement dans le contexte des PME, au profit des chercheurs, des gestionnaires et des décideurs politiques.	
<b>Objectif spécifique 1 (rappel)</b>	<b>Objectif spécifique 1 (atteinte)</b>
- Circonscrire les antécédents de l'innovation en se focalisant sur le CA tout en considérant les facteurs environnementaux pouvant potentiellement modérer ou médier ce lien.	- Proposition d'un cadre conceptuel intégrateur du lien entre le CA et l'innovation sous une perspective de contingence mettant en relief tant les vecteurs que les inhibiteurs d'innovation;
<b>Objectif spécifique 2 (rappel)</b>	<b>Objectif spécifique 2 (atteinte)</b>
- Théoriser et expérimenter l'influence des effets d'interactions entre différentes facettes du CA (c.-à-d. composition, rôles et efficacité) sur l'innovation (c.-à-d. innovation interne de produits/services) dans le contexte des PME, tout en accordant une place importante aux facteurs environnementaux.	- Théorisation et validation d'un processus séquentiel et multiphasique, qui régit l'impact des effets d'interaction entre la composition (c.-à-d. taille et indépendance), les rôles (c.-à-d. contrôle et stratégie) et l'efficacité (c.-à-d. historique des contributions) du CA sur l'innovation (c.-à-d. innovation interne de produits/services) dans le contexte des PME, tout en considérant l'influence potentielle de diverses caractéristiques organisationnelles (c.-à-d. taille, âge, secteur, performance financière et internationalisation des PME);
<b>Objectif spécifique 3 (rappel)</b>	<b>Objectif spécifique 3 (atteinte)</b>
- Théoriser et expérimenter l'impact des effets combinés de certains processus liés au CA (c.-à-d. établissement, intégration, centralisation et bureaucratie), toujours par rapport à l'innovation (c.-à-d. innovation interne de produits/services), dans le contexte des PME et en accordant une place importante aux facteurs environnementaux.	- Théorisation et validation d'une logique de continuum et d'une approche configurationnelle, qui régissent l'impact des effets combinés de processus originaux liés au CA (c.-à-d. établissement, intégration, centralisation et bureaucratie), toujours par rapport à l'innovation (c.-à-d. innovation interne de produits/services) et dans le contexte des PME, tout en considérant l'influence potentielle du niveau de croissance bidimensionnelle des PME (c.-à-d. taille et âge).

---

Le premier objectif spécifique (c.-à-d. circonscrire les antécédents de l'innovation en se focalisant sur le CA tout en considérant les facteurs environnementaux pouvant potentiellement modérer ou médier ce lien) était associé à trois sous-objectifs. Leur rappel et leur atteinte sont illustrés dans le tableau 24.

**Tableau 24.** Rappel et atteinte des sous-objectifs spécifiques de recherche de l'article 1

Sous-objectif (rappel)	Sous-objectifs (atteinte)
<ul style="list-style-type: none"> <li>- Mettre en relief les <b>caractéristiques du CA</b> qui ont un <b>impact significatif</b> sur l'innovation;</li> </ul>	<ul style="list-style-type: none"> <li>- Édification d'un cadre conceptuel intégrateur du lien entre le CA et l'innovation sous une perspective de contingence, qui met en relief les <b>principales caractéristiques du CA</b> ayant un <b>impact significatif sur l'innovation</b>, en l'occurrence sa <b>composition</b> (c.-à-d. taille, indépendance, diversité, capital humain et capital social), ses <b>rôles</b> (c.-à-d. contrôle et stratégie), son <b>efficacité</b> et sa <b>cohésion</b>, ainsi que <b>ses processus</b> (c.-à-d. implication, engagement et orchestration);</li> </ul>
<ul style="list-style-type: none"> <li>- Relever les facteurs environnementaux internes et externes qui ont un impact significatif sur l'innovation et qui pourraient en ce sens potentiellement modérer ou médier ce lien;</li> </ul>	<ul style="list-style-type: none"> <li>- Édification d'un cadre conceptuel intégrateur du lien entre le CA et l'innovation <b>sous une perspective de contingence</b>, qui met en relief les <b>principaux facteurs environnementaux internes</b> (c.-à-d. PDG, actionnariat, équipe de direction, taille, âge et santé financière) et <b>externes</b> (c.-à-d. secteur, réseau et région) ayant un <b>impact significatif sur l'innovation</b> et pouvant en ce sens potentiellement modérer ou médier ce lien;</li> </ul>
<ul style="list-style-type: none"> <li>- Émettre des recommandations au profit des chercheurs, des dirigeants et des décideurs politiques.</li> </ul>	<ul style="list-style-type: none"> <li>- Émission d'une série de <b>recommandations</b> déclinées en trois principaux axes : <b>cadres théoriques</b> (c.-à-d. théorie de l'intendance, théorie basée sur les ressources, théorie de dépendance envers les ressources, théorie des parties prenantes et théorie de la contingence); <b>cadres analytiques</b> (c.-à-d. concepts liés à composition du CA, concepts sous-représentés au niveau du CA, opérationnalisation de l'innovation et approche de contingence); <b>cadres méthodologiques</b> (c.-à-d. données primaires, raccourcis statistiques, approche qualitative, contexte géographique, secteur financier et PME).</li> </ul>

Le second objectif spécifique (c.-à-d. théoriser et expérimenter l'influence des effets d'interaction entre différentes facettes du CA [c.-à-d. composition, rôles et efficacité] sur l'innovation [c.-à-d. innovation interne de produits/services] dans le contexte des PME, tout en accordant une place importante aux facteurs environnementaux), était associé à six sous-objectifs. Leur rappel et leur atteinte sont illustrés dans le tableau 25.

**Tableau 25.** Rappel et atteinte des sous-objectifs spécifiques de recherche de l'article 2

Sous-objectif (rappel)	Sous-objectifs (atteinte)
- Analyser l'impact de la taille et de l'indépendance du CA sur le capital humain du CA;	- Conclusion de l' <b>impact négatif</b> (significatif) tant de la <b>taille</b> que de l' <b>indépendance</b> du CA sur le <b>capital humain</b> du CA;
- Analyser l'impact du capital humain du CA sur les rôles de contrôle et de stratégie du CA;	- Conclusion de l' <b>impact positif</b> (significatif) du <b>capital humain</b> du CA sur les <b>rôles de contrôle</b> et de <b>stratégie</b> du CA;
- Analyser l'impact des rôles de contrôle et de stratégie du CA sur l'efficacité du CA;	- Conclusion de l' <b>absence d'impact significatif</b> du <b>rôle de contrôle</b> ainsi que de l' <b>impact positif</b> (significatif) du <b>rôle de stratégie</b> du CA sur l' <b>efficacité</b> du CA;
- Analyser l'impact de l'efficacité du CA sur l'innovation;	- Conclusion de l' <b>impact positif</b> (significatif) de l' <b>efficacité</b> du CA;
- Analyser l'impact de la taille, de l'âge, du secteur, de l'internationalisation et de la performance financière des PME sur l'innovation;	- Conclusion de l' <b>absence d'impact significatif</b> , de la <b>taille</b> , de l' <b>âge</b> , du <b>secteur</b> et de la <b>performance financière</b> , mais de l' <b>impact positif</b> (significatif) de l' <b>internationalisation</b> des PME sur l' <b>innovation</b> ;
- Émettre des recommandations au profit des chercheurs, des dirigeants et des décideurs politiques.	- Émission d'une série de <b>recommandations</b> liées, entre autres, aux <b>différentes facettes du CA</b> (c.-à-d. composition, rôles et efficacité) et à <b>divers facteurs environnementaux</b> (c.-à-d. taille, âge, secteur, performance financière et internationalisation).

Le troisième objectif spécifique (c.-à-d. théoriser et expérimenter l'impact des effets combinés de certains processus liés au CA [c.-à-d. établissement, intégration, centralisation et bureaucratie], toujours par rapport à l'innovation [c.-à-d. innovation interne de produits/services], dans le contexte des PME et en accordant une place importante aux facteurs environnementaux), était associé à six sous-objectifs. Leur rappel et leur atteinte sont illustrés dans le tableau 26.

**Tableau 26.** Rappel et atteinte des sous-objectifs spécifiques de recherche de l'article 3

Sous-objectif (rappel)	Sous-objectifs (atteinte)
- Analyser la pertinence du processus d'établissement en lien avec le CA;	- La <b>présence</b> de cette condition a été observée dans <b>six</b> et son <b>absence</b> dans <b>une</b> des 10 configurations qui mènent à des niveaux élevés d'innovation dans le contexte des PME;
- Analyser la pertinence du processus d'intégration en lien avec le CA;	- La <b>présence</b> de cette condition a été observée dans <b>cinq</b> et son <b>absence</b> dans <b>deux</b> des 10 configurations qui mènent à des niveaux élevés d'innovation dans le contexte des PME;
- Analyser la pertinence du processus de centralisation en lien avec le CA;	- La <b>présence</b> de cette condition a été observée dans <b>deux</b> et son <b>absence</b> dans <b>six</b> des 10 configurations qui mènent à des niveaux élevés d'innovation dans le contexte des PME;
- Analyser la pertinence du processus de bureaucratie en lien avec le CA;	- La <b>présence</b> de cette condition a été observée dans <b>quatre</b> et son <b>absence</b> dans <b>trois</b> des 10 configurations qui mènent à des niveaux élevés d'innovation dans le contexte des PME;
- Analyser la pertinence du niveau de croissance bidimensionnelle des PME (c.-à-d. taille et âge) par rapport à l'innovation.	- La <b>présence</b> de ces deux conditions a été observée dans <b>deux</b> (taille et âge) et leur <b>absence</b> dans <b>six</b> (taille) et <b>cinq</b> (âge) des 10 configurations qui mènent à des niveaux élevés d'innovation dans le contexte des PME;
- Émettre des recommandations au profit des chercheurs, des dirigeants et des décideurs politiques.	- Émission d'une série de <b>recommandations</b> liées, entre autres, aux <b>processus associés au CA</b> (c.-à-d. établissement, intégration, centralisation et bureaucratie) et <b>au niveau de croissance bidimensionnelle</b> des PME (c.-à-d. taille et âge).

## **Principales contributions scientifiques**

Cette thèse doctorale renferme plusieurs contributions scientifiques, qui forment un amalgame d'apports théoriques et empiriques. Ceux-ci peuvent être résumés en quatre principaux points : (1) triple théorisation originale, (2) ancrage théorique multidimensionnel, (3) conceptualisation novatrice et (4) vision inclusive du lien entre le CA et l'innovation.

### *Triple théorisation originale du lien entre le CA et l'innovation*

Le cadre conceptuel intégrateur édifié (chapitre/article 1) a permis de théoriser un processus général régissant le lien entre le CA et l'innovation. Celui-ci met en relief les phases séquentielles impliquées, qui réfèrent respectivement à la composition (c.-à-d. taille, indépendance, diversité, capital humain et capital social), aux rôles (c.-à-d. contrôle et stratégie), à l'efficacité et à la cohésion, ainsi qu'aux processus (c.-à-d. implication, engagement et orchestration) du CA; en plus de distinguer les intrants des extrants d'innovation. Cela procure une meilleure compréhension des mécanismes et des rouages sous-jacents à l'impact du CA sur l'innovation et enrichit la littérature actuelle à trois principaux niveaux, soit en :

- Complémentant les revues de la littérature étendues qui se sont penchées sur certaines dimensions spécifiques du CA telles que ses rôles (Åberg et al., 2019; Johnson et al., 1996) et sa diversité (Baker et al. 2020, 2018; Kirsch, 2018), ou encore sur ses contributions au niveau stratégique (Bezemer et al., 2022; Schaedler et al., 2021; Pugliese et al., 2009) et en matière de performance financière (Erhardt et al., 2003; Nguyen et al., 2020).
- Élargissant et en approfondissant les conclusions issues de l'article de Gonzales-Bustos and Hernández-Lara (2016) qui analyse le lien entre la gouvernance d'entreprise et l'innovation en ne considérant donc que partiellement le CA, de l'étude de Kurzhals et al. (2020) qui s'intéresse au lien entre le CA et l'innovation en ciblant exclusivement l'innovation technologique et du papier de Sierra-Morán et al. (2021) qui se penche sur la relation entre le CA et l'innovation en utilisant une méthode de méta-analyse qui la confine à se concentrer sur les variables structurelles du CA.

- Identifiant et en expliquant les lacunes et les résultats mitigés (Arzubiaga et al., 2018; Honoré et al., 2015; Matzler et al., 2015) dans le but d'en tirer les leçons et d'émettre une série de recommandations sous forme d'un agenda de recherche détaillé afin de guider les recherches futures et de contribuer à ce que cette littérature soit alimentée sur des bases plus optimales à l'avenir.

Le processus multiphasique développé (chapitre/article 2) permet de théoriser l'impact des effets d'interactions entre la composition (c.-à-d. taille et indépendance), les rôles (c.-à-d. contrôle et stratégie) et l'efficacité (c.-à-d. historique des contributions) du CA sur l'innovation (c.-à-d. innovation interne de produits/services) dans le contexte des PME. Celui-ci démontre que le lien entre le CA et l'innovation dans le contexte des PME implique des effets de médiation entre différentes facettes du CA; suivant une logique séquentielle. Cela permet de se démarquer de la littérature actuelle de trois principales façons, soit en :

- Analysant simultanément la composition et les rôles du CA, alors qu'un choix est généralement fait entre les deux (Bendig et al., 2020; Miller et Triana, 2009), ce qui n'est pas optimal étant donné que la capacité du CA à s'acquitter adéquatement de ses rôles dépend en grande partie de sa composition (Bernile et al., 2018; Pearce et Zahra, 1992) et que tant la composition (Hillman et al., 2000; Zona, 2016) que les rôles (Forbes et Milliken, 1999; Zattoni et al., 2015) du CA peuvent contribuer à la performance en général et l'innovation en particulier.
- Examinant de potentiels effets indirects tandis que l'hypothèse de liens directs est souvent privilégiée alors qu'il est nécessaire de considérer l'éventualité d'interactions entre divers concepts du CA pour expliquer son impact sur l'innovation (Arzubiaga et al., 2018; Bendig et al., 2020; Kurzhals et al., 2020; Querbach et al., 2020).
- Considérant l'efficacité du CA, qui fait partie des concepts les moins étudiés, notamment dû à la difficulté de la mesurer (Bonini et Lagasio, 2022; Forbes et Milliken, 1999; Payne, Benson et Finegol, 2009), mais qui est pourtant une notion essentielle pour mieux appréhender les contributions organisationnelles de cet organe de gouvernance (Boivie et al., 2021; Bonini et Lagasio, 2022; Nicholson et Kiel, 2004).

La logique de continuum élaborée (chapitre/article 3) permet de théoriser l'impact des effets combinés de quatre processus liés au CA (c.-à-d. établissement, intégration, centralisation et bureaucratie), toujours par rapport à l'innovation (c.-à-d. innovation interne de produits/services) et dans le contexte des PME. Celle-ci révèle qu'il est possible pour les PME de stimuler l'innovation à travers diverses configurations de processus liés au CA, qui interviennent à différents moments (c.-à-d. en amont, au milieu et en aval). Cela contribue à l'avancement des connaissances sur trois principaux plans, soit en :

- Répondant aux appels répétés de la communauté scientifique spécialisée en gouvernance d'entreprise visant à documenter les processus liés au CA (Federo et al., 2020; Kumar et Zattoni, 2019; Uhlaner et al., 2021) et à mieux comprendre les contributions stratégiques du CA (Bezemer et al., 2022; Lungeanu et Zajac, 2019; Panayi et al., 2021).
- Enrichissant les conclusions disponibles aujourd'hui, qui se situent pour une très large majorité vers le milieu du continuum et plus précisément autour de la composition du CA, alors que cette dernière est partielle pour expliquer la performance des organisations de manière générale (Johnson et al., 1996; Pearce II and Patel, 2018) et l'innovation en particulier (Kurzahls et al., 2020; Sierra-Morán et al., 2021).
- S'émancipant de la vision limitée qui prévaut encore aujourd'hui dans la littérature quant à l'hypothèse d'effets linéaires et de la tendance à établir des hiérarchies qui sous-entendent que certains éléments isolés en lien avec le CA seraient forcément prééminents par rapport à d'autres pour expliquer les contributions de cet organe de gouvernance au niveau organisationnel (Garcia-Ramos et Diaz, 2021; Schiehl et al., 2018).

#### *Ancrage théorique multidimensionnel du lien entre le CA et l'innovation*

L'ancrage théorique multidimensionnel préconisé (c.-à-d. théories de l'agence, de l'intendance, basée sur des ressources, de la dépendance envers les ressources, des parties prenantes, de la complexité et de la contingence) permet de contribuer à la réflexion scientifique autour du lien entre le CA et l'innovation (chapitre/article 1, 2 et 3). Celui-ci répond notamment au besoin d'aller au-delà de la théorie dominante en gouvernance (c.-à-d.



théorie de l'agence) (Arzubiaga et al., 2018 ; Zone, 2016), ce qui est d'autant plus nécessaire sachant que cette dernière n'est pas idéale pour analyser l'innovation (Eisenhardt, 1989; Kor, 2006; Bravo et Reguera-Alvarado, 2017) et les PME (Brunninge et al., 2007; De Massis et al., 2016; Gnan et al., 2015).

Les leçons tirées au niveau des fondements théoriques mobilisés par la littérature à l'intersection du CA et de l'innovation et les nombreuses recommandations qui y sont associées (chapitre/article 1) fournissent des bases solides pour consolider la pensée des chercheurs analysant ce phénomène. Concrètement, il en est ressorti cinq théories prometteuses quand le but est de tendre vers une meilleure compréhension de l'impact du CA sur l'innovation : (1) la théorie de l'intendance; (2) la théorie basée sur les ressources; (3) la théorie de dépendance envers les ressources; (4) la théorie des parties prenantes; (5) la théorie de la contingence. Cela permet, entre autres, de répondre à l'appel de plusieurs auteurs quant au besoin de fournir des alternatives théoriques dans le domaine de la gouvernance d'entreprise (Boivie et al., 2021; Cuomo et al., 2016; Kumar et Zattoni, 2019).

La combinaison de théories (p. ex. théories de l'agence et de la dépendance envers les ressources) révèle leur caractère tantôt complémentaire, tantôt contradictoire (chapitre/article 2). Cela se traduit par le fait que pour certains concepts (p. ex. capital humain du CA), les positionnements convergent quant à l'hypothèse de l'impact positif sur l'innovation, mais s'opposent au niveau d'autres variables (p. ex. taille du CA). Ces observations suggèrent que, dépendamment des choix théoriques, l'argumentation et les hypothèses qui en découlent peuvent être biaisées et diamétralement opposées. Par le fait même, cela fait écho à la recommandation de plusieurs chercheurs quant à la nécessité de privilégier une combinaison de théories afin d'analyser de lien entre le CA et l'innovation (Aaboen et al., 2006; Chang et Wu, 2020; et O'Connor, 2013).

Le recours à certaines théories spécifiques (p. ex. théorie de la complexité et théorie de la contingence) procure une compréhension plus fine et injecte une dose de nuance essentielle (chapitre/article 2) permettant d'avoir une vision inclusive (c.-à-d. en relativisant l'importance d'attributs isolés du CA et en démontrant que le CA n'est pas imperméable à son environnement) du lien entre le CA et l'innovation. Cela répond au besoin d'accorder une plus grande place aux facteurs de contingence pour comprendre les antécédents de la

performance des organisations et les contributions du CA, surtout en matière d'innovation (Burns & Stalker, 1961, Zahra et Pearce, 1989; Zona et al., 2013). Cela confirme également la pertinence des méthodes asymétriques pour mieux appréhender la complexité du phénomène à l'étude (Garcia-Ramos et Diaz, 2021; Kauffman, 1993; Misangyi et al., 2017), surtout face à une retombée organisationnelle comme l'innovation (McCannet Bahl, 2017; Weeth et al., 2020).

### *Conceptualisation novatrice du lien entre le CA et l'innovation*

La cartographie détaillée des études portant sur le lien entre le CA et l'innovation offre une vision intégratrice (chapitre/article 1) et met en évidence les concepts qui semblent les plus bénéfiques ainsi que ceux qui paraissent les plus préjudiciables tant pour les intrants que pour les extrants d'innovation. Cela permet de poser les bases nécessaires afin de traiter deux des plus grands problèmes qui caractérisent les travaux portant sur cette thématique. Le premier concerne l'homogénéité dans la sélection des variables (Baum et al., 2022; Sierra-Morán et al., 2021; Vandenbroucke et al., 2016), qui implique que beaucoup de concepts restent sous-étudiés (Balsmeier et al., 2017; Baum et al., 2022; Robeson et O'Connor, 2013). Le second réfère à l'hétérogénéité dans leur mesure (Sierra-Morán et al., 2021; Kor, 2006 ; Zona et al., 2013), qui a certainement une grande part de responsabilité dans le fait que cette littérature soit si fragmentée; comme en témoignent par exemple les résultats mitigés en ce qui concerne l'impact de l'indépendance du CA sur les extrants d'innovation (Chen et al., 2016; Srinivasan et al., 2018; Zahra et al., 2000).

La conceptualisation et l'opérationnalisation des différentes facettes du CA analysées (c.-à-d. capital humain, rôle de contrôle, rôle de stratégie et surtout efficacité du CA) (chapitre/article 2) représentent de précieuses contributions à la littérature. À ce jour, il n'y a pas de mesures qui font office de références pour ces concepts. De plus, les tentatives d'opérationnalisation se font plutôt rares, ce qui implique qu'il est particulièrement difficile de se faire une idée concrète de leur impact sur l'innovation. Or, théoriquement, l'intérêt du capital humain, du rôle de contrôle, du rôle de stratégie et de l'efficacité du CA n'est plus à prouver (Boivie et al., 2021; Johnson et al., 2013; Khanna et al., 2014; Tasheva et Hillman, 2019). Ainsi, le fait que les construits utilisés pour ces quatre variables soient dûment appuyés par la littérature, rigoureusement validés statistiquement et en conformité avec les

spécificités des PME en matière de gouvernance, permet d'introduire des mesures originales pour quatre paramètres cruciaux en lien avec le CA; surtout à des fins d'innovation.

La conceptualisation et l'opérationnalisation des divers processus liés au CA considérés (c.-à-d. établissement, intégration, centralisation et bureaucratie) (chapitre/article 3) conformément aux spécificités des PME constituent également des apports notables à la littérature. D'abord, ceux-ci permettent de donner suite aux tentatives de sensibilisation des spécialistes en gouvernance d'entreprise par rapport à l'importance des processus du CA, qui datent de plus trois décennies (Forbes and Milliken, 1999; Pettigrew, 1992; Zattoni et al., 2015) et qui ont été largement ignorés, comme en témoignent les récentes réitérations du besoin de documenter davantage cette dimension du CA (Federo et al., 2020; Kumar et Zattoni, 2019; Uhlaner et 2021). Par le fait même, il devient possible de transcender le modèle de Forbes et Milliken (1999), qui est considéré comme le point de référence en matière de processus du CA (Arzubiaga et al., 2018 ; Zattoni et al., 2015 ; Zhu et al., 2016) et qui nécessitait d'être enrichi sur la base de nouveaux processus (Bezemer et al., 2022). Il en résulte donc la proposition de quatre paramètres originaux (c.-à-d. processus d'établissement, d'intégration, de centralisation et de bureaucratie liés au CA) dont les combinaisons peuvent stimuler l'innovation dans le contexte des PME.

#### *Vision inclusive du lien entre le CA et l'innovation*

La perspective de contingence adoptée a permis de brosser un portrait plus complet et de fournir une vision plus inclusive du lien entre le CA et l'innovation. Le chapitre/article 1 a mis en relief divers éléments associés à l'environnement interne (c.-à-d. PDG, actionnariat, équipe de direction, taille, âge et santé financière) et externe (c.-à-d. secteur, réseau et région) qui ont un impact significatif sur l'innovation. Le chapitre/article 2 a pris en compte les effets potentiels de diverses caractéristiques organisationnelles (c.-à-d. taille, âge, secteur, performance financière et internationalisation des PME) sur l'innovation, ce qui a révélé l'impact positif et significatif de l'internationalisation. Le chapitre/article 3 a considéré les effets potentiels de la taille et de l'âge des PME, ce qui a démontré que les combinaisons de processus liés au CA évoluent selon le stade de croissance bidimensionnelle des PME. Ces éléments corroborent le fait que les contributions du CA ne sont pas imperméables aux facteurs environnementaux (Huse, 2000; Pearce et Zahra, 1992; Thorgren et al., 2010; Wu,

2008; Wu et Wu, 2014), que l'innovation requiert tant des ressources internes qu'externes (Gurtner et Reinhardt, 2016; Piening et Salge, 2015) et qu'il est en ce sens fondamental d'inclure divers facteurs de contingence quand il est question d'analyser le lien entre le CA et l'innovation (Chen et al., 2016; Sena et 2018; Zona et al., 2013).

## **Principales contributions pratiques**

Cette thèse doctorale contient plusieurs contributions pratiques, qui peuvent façonner tant les initiatives déployées par les dirigeants que les politiques mises en œuvre par les autorités gouvernementales. Celles-ci se résument en trois principaux points : (1) portée stratégique du CA, (2) axes d'intervention prioritaires visant à optimiser les apports du CA en matière d'innovation et (3) axes d'intervention prioritaires visant à créer un environnement propice à l'innovation. Ces éléments permettent donc d'inspirer plusieurs pistes d'actions concrètes afin que le CA soit dans des conditions optimales pour contribuer à l'innovation, et plus largement que les organisations, particulièrement les PME, évoluent dans un environnement propice à l'innovation.

### *Portée stratégique du CA*

Les nombreux liens significatifs qui ont été établis sur des bases conceptuelles et empiriques contribuent à sensibiliser tant les dirigeants d'entreprises que les décideurs politiques quant à l'intérêt du CA en matière d'innovation (chapitres/articles 1, 2 et 3). Cela représente un témoignage édifiant de la portée stratégique du CA, peu importe la taille de l'organisation. Toutefois, ce constat encourage particulièrement les PME à se doter de cet organe de gouvernance, alors qu'une telle initiative reste peu conventionnelle, en démontrant que celui-ci peut s'avérer une précieuse addition à l'équipe de direction et/ou au fondateur. Cela favorise donc la prise de conscience des PME quant au fait que la gouvernance d'entreprise, et plus précisément un organe tel que le CA, n'est pas l'apanage des grandes organisations. Par ailleurs, ces observations suggèrent que le CA serait un outil intéressant pour aider les PME à mieux composer avec les défis majeurs auxquels celles-ci sont souvent confrontées, et qui représentent des freins importants à l'innovation; notamment ceux en matière de ressources financières et matérielles limitées.

### *Axes d'intervention prioritaires pour optimiser les apports du CA en matière d'innovation*

Les principaux regroupements de caractéristiques du CA qui se sont démarqués par leur impact significatif sur l'innovation (c.-à-d. la composition du CA qui est représentée par sa taille, son indépendance, sa diversité, son capital humain et son capital social du CA; les rôles de contrôle et de stratégie du CA ainsi que tant l'efficacité que la cohésion qui y sont associés; les processus du CA qui sont représentés par son implication, son engagement et son orchestration) peuvent être considérés comme des axes d'intervention prioritaires afin d'optimiser les contributions du CA en matière d'innovation et ultimement de stimuler le degré d'innovation des organisations (chapitre/article 1). Ces éléments s'avèrent être des alternatives intéressantes ou du moins des compléments prometteurs aux initiatives plus classiques comme celles à l'interne qui visent à promouvoir la R-D ou encore celles à l'externe qui consistent à s'engager dans la poursuite d'innovation ouverte.

Les trois principales dimensions du CA qui ont été analysées (c.-à-d. composition, rôles et efficacité) renvoient à plusieurs recommandations concrètes (chapitre/article 2). D'abord, le fait que la croissance de la taille et de l'indépendance du CA diminue le degré de capital humain du CA est un résultat plutôt contre-intuitif, mais non pour le moins instructif. Celui-ci suggère que la croissance de la taille ou de l'indépendance du CA n'entraîne pas nécessairement une augmentation du capital humain du CA. Or, c'est à travers son capital humain que le CA serait en capacité à déployer son arsenal stratégique et à faire preuve d'efficacité; ce qui le mettrait ultimement en position de contribuer à l'innovation. Ainsi, les différents éléments formant les trois construits du CA qui sont impliqués dans ce cheminement vers l'innovation (c.-à-d. capital humain, rôle stratégique et efficacité du CA) peuvent inspirer une feuille de route riche pour les PME afin de développer une meilleure gestion de leur CA dans l'optique d'innover. Ceux-ci révèlent notamment que l'efficacité du CA serait le chaînon qui lie cette instance de gouvernance à l'innovation alors qu'aujourd'hui les recommandations émises aux entreprises portent surtout sur des considérations en lien avec la composition et les rôles du CA. Parallèlement, ces éléments constituent des pistes de réflexion et d'action afin de contribuer à la pérennité des PME, qui est à l'heure actuelle encore un enjeu majeur dans beaucoup de pays. Les autorités gouvernementales gagneraient donc à faire en sorte que les initiatives et les politiques dédiées à la stimulation de l'innovation reflètent l'importance de la gouvernance d'entreprise, et spécifiquement celle

du CA, ce qui fait aujourd'hui défaut à la zone géographique couverte dans cette étude (Québec, Canada). Pourtant, ce territoire accuse un retard important en matière d'innovation et témoigne d'une redondance quant aux initiatives déployées pour tenter de rectifier le tir; le fait d'explorer de nouvelles avenues pour gérer cette réalité serait donc porteur.

Les processus originaux liés au CA qui ont été abordés (c.-à-d. établissement, intégration, centralisation et bureaucratie) fournissent également des points de référence afin de constituer des plans d'action en soutien à l'efficacité du CA. Les PME y trouveront notamment des bases solides afin d'alimenter leur réflexion concernant le choix d'instaurer un CA, l'intégration des administrateurs, les enjeux de concentration du pouvoir au sein du CA et les considérations en lien avec l'enlisement potentiel du CA dans la bureaucratie. Les 10 différents scénarios permettant de stimuler l'innovation offrent aux entreprises une panoplie d'options parmi lesquelles elles pourront choisir celles qui leur semblent les plus accessibles par rapport à leurs capacités et à leurs réalités. De ce fait, les PME peuvent utiliser ces éléments pour coordonner des actions ciblées (c.-à-d. pour chacun des processus liés au CA), mais aussi des actions groupées touchant simultanément à ces processus en se référant notamment aux effets de complémentarité et de substitution inhérents à ces derniers. Par le fait même, cela oriente les responsables politiques vers l'intérêt de miser sur l'amélioration des pratiques de gouvernance d'entreprise afin de stimuler l'innovation, en se concentrant spécifiquement sur les processus liés au CA. Concrètement, les organismes dont la mission est de former des administrateurs pourraient développer et enseigner des contenus autour des quatre processus liés au CA qui ont été analysés afin d'optimiser les contributions potentielles des administrateurs en matière d'innovation. Dans cette continuité, le fait de créer des programmes de subventions destinés à couvrir partiellement ou totalement les coûts de formation en gouvernance des administrateurs de PME pourrait s'avérer judicieux.

#### *Axes d'intervention prioritaires pour créer un environnement propice à l'innovation*

Les nombreux facteurs environnementaux qui se sont avérés significatifs pour expliquer l'innovation témoignent de la possibilité d'un lien indirect entre le CA et l'innovation (chapitre/article 1), qui implique de potentiels effets d'interaction entre le CA et son environnement tant interne qu'externe. En ce sens, les principaux regroupements de concepts liés à l'environnement interne (c.-à-d. PDG, actionnariat, équipe de direction, taille, âge et

santé financière) et externe (c.-à-d. secteur, réseau et région) qui se sont démarqués par leur impact significatif sur l'innovation peuvent aussi être considérés comme des axes d'intervention prioritaires; cette fois plus largement pour créer un environnement propice à l'innovation.

Toutefois, il semblerait que la taille, l'âge et le fait d'œuvrer dans un secteur à propension technologique ne représentent pas forcément des exigences pour innover (chapitre/article 2). Ces observations démontrent que les barrières à l'innovation qui s'y rapportent (c.-à-d. petite taille, jeune âge et intensité technologique plutôt faible), et qui sont souvent symptomatiques de la difficulté des PME à innover, ne sont pas insurmontables; et que le CA semble jouer un rôle clé à ces fins.

Les 10 configurations qui ont été identifiées (chapitre/article 3) permettent de contextualiser les recommandations associées aux processus liés au CA par rapport au niveau de croissance bidimensionnelle des PME (c.-à-d. taille et âge). Il en ressort deux grandes catégories de PME : les petites et jeunes ainsi que les grandes et âgées. Les entreprises peuvent donc sélectionner les configurations de processus liés au CA qui sont le plus en adéquation avec leur niveau de croissance bidimensionnelle afin de stimuler l'innovation. Ainsi, peu importe leur taille et leur âge, les PME trouveront des configurations qui leur correspondent.

## **Principales limites et pistes de recherche**

Cette thèse doctorale renferme de nombreuses contributions scientifiques et pratiques, mais n'est pas exempte de limites qui forment les moules de recherches futures. Les principales limites et pistes de recherche peuvent être déclinées en quatre principales catégories et représentent en fait les miroirs des principales contributions scientifiques : (1) triple théorisation originale, (2) ancrage théorique multidimensionnel, (3) conceptualisation novatrice et (4) vision inclusive du lien entre le CA et l'innovation.

### *Limites et pistes de recherche liées à la triple théorisation originale*

Le cadre conceptuel intégrateur édifié (chapitre/article 1), le processus multiphasique développé (chapitre/article) et (3) la logique de continuum élaborée (chapitre/article 3) ont produit des résultats qui reflètent certains choix faits par l'auteur et qui impliquent que les conclusions auraient pu sensiblement différer si d'autres pistes avaient été explorées. Le fait

de ne pas considérer exclusivement les articles parus dans les meilleures revues scientifiques et ceux de nature empirique aurait certainement permis d'obtenir davantage d'informations, qui auraient pu enrichir et/ou modifier les constats établis (chapitre/article 1). Le fait de prendre en compte la diversité du CA complémentirement ou en remplacement à sa taille et à son indépendance, le capital social du CA en plus ou au lieu de son capital humain ainsi que la cohésion du CA parallèlement ou séparément de son efficacité, pourrait mener à un processus multiphasique différent et changer la logique séquentielle établie pour lier le CA à l'innovation; et ultimement altérer l'influence de cet organe de gouvernance sur l'innovation (chapitre/article 2). Le fait de s'intéresser à d'autres processus liés au CA, par exemple ceux qui concernent le traitement et l'échange d'information ou encore les interactions entre les administrateurs et l'équipe de direction, donnerait potentiellement naissance à une nouvelle logique de continuum et à d'autres configurations inédites (chapitre/article 3). Finalement, le fait de se pencher sur un type d'innovation spécifique (c.-à-d. innovation interne de produits/services) implique qu'il faut concéder que l'analyse d'autres types (p. ex. innovation de procédés) ou approches (p. ex. innovation ouverte) d'innovation pourrait mener à de nouveaux constats. En d'autres termes, les théorisations développées sont valables dans la limite des choix conceptuels effectués et sont susceptibles d'évoluer à la lumière d'éventuelles modifications dans les fondements théoriques et cadres analytiques mobilisés. Les alternatives mentionnées dans les lignes précédentes représentent donc toutes des pistes intéressantes à investiguer, qui permettraient de tester davantage la validité des théorisations produites et de les enrichir.

#### *Limites et pistes de recherche liées à l'ancrage théorique multidimensionnel*

L'ancrage théorique multidimensionnel a démontré que pour de mêmes variables, les postulats théoriques peuvent orienter vers des hypothèses différentes. Cela suggère que le fait de mobiliser d'autres théories pourrait modifier le positionnement en ce qui concerne l'impact présagé des diverses dimensions du CA. De ce fait, des études qui s'attèleraient à proposer et à justifier l'application des théories ne s'inscrivant pas dans le champ de la gouvernance d'entreprise, par exemple des théories dans les domaines de l'entrepreneuriat et de l'innovation, seraient particulièrement intéressantes. Dans cette continuité, les tests statistiques sophistiqués utilisés, en l'occurrence la modélisation par équations structurelles (*structural equation modeling*) (chapitre/article 2) et l'analyse par logique floue (*fuzzy-set*



*qualitative comparative analysis*) (chapitre/article 3), malgré leurs nombreux avantages, démontrent que les études quantitatives permettent une compréhension plus théorique que pratique du lien entre le CA et l'innovation. Ainsi, le fait d'adopter une approche qualitative pure serait un complément intéressant, qui permettrait de réduire davantage le niveau d'abstraction et de tendre vers une compréhension encore plus substantielle et concrète de la manière dont opère le lien entre le CA et l'innovation. Il deviendrait dès lors possible de confronter les raisonnements théoriques aux réalités du terrain ainsi que de mieux assimiler comment les liens significatifs établis et les configurations identifiées se matérialisent. Cela semble d'autant plus nécessaire que plusieurs des concepts étudiés (p. ex. rôles et processus liés au CA) ne peuvent être pleinement capturés sur des bases statistiques. L'observation directe ou au moins via des entretiens par l'entremise d'études de cas serait donc vivement recommandée. L'accès aux administrateurs représente certes un défi monumental (Leblanc et Shwartz, 2007; Pugliese et al., 2015), mais de récentes études ont démontré que celui-ci n'est pas insurmontable (Bezemer et al., 2021; Boivie et al., 2021; Veltrop et al., 2021) et certains travaux donnent des astuces à ces fins (Ma et al., 2021; Solarino et Aguinis, 2021).

#### *Limites et pistes de recherche liées à la conceptualisation novatrice*

Cette thèse doctorale développe plusieurs mesures novatrices dans le cadre du chapitre/article 2 (c.-à-d. capital humain, rôle de contrôle, rôle de stratégie et efficacité du CA) et du chapitre/article 3 (processus d'établissement, d'intégration, de centralisation et de bureaucratie liés au CA), pour des concepts dont aucun n'a atteint de consensus en matière d'opérationnalisation. Ainsi, bien que les choix aient été inspirés par les recherches antérieures et rigoureusement validés par des tests statistiques sophistiqués, il s'agit de construits partiels pour lesquels différentes voies auraient pu être empruntées afin de les opérationnaliser. Il serait donc d'un apport considérable de se pencher plus longuement sur l'opérationnalisation de l'ensemble des construits originaux proposés afin de développer des concepts et des résultats encore plus robustes. Cet axe de recherche, qui consiste à valider des construits mesurant différents attributs du CA, est encore relativement vierge et renferme donc un très fort potentiel de contributions dont l'intérêt est palpable tant d'un point de vue scientifique que pratique. Le fait de l'alimenter aurait notamment pour avantage d'aider à atténuer la fragmentation dont témoigne la littérature à la jonction du CA et de l'innovation

en permettant de cheminer vers des normes et d'éventuellement tendre vers une certaine homogénéité au niveau des mesures utilisés.

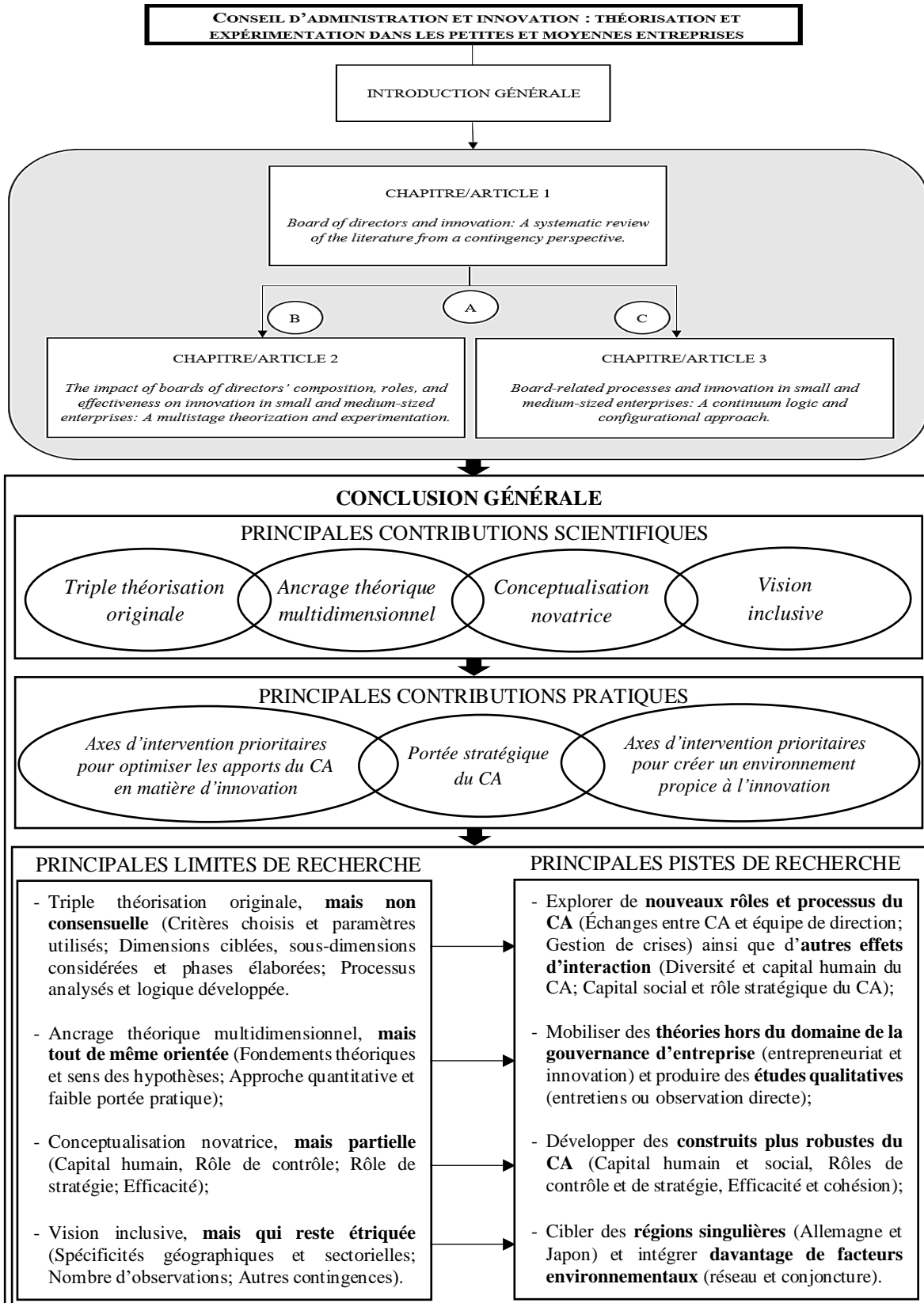
#### *Limites et pistes de recherche en lien avec la vision inclusive*

Le terrain de recherche privilégié (c.-à-d. Québec, Canada) pour le volet empirique à deux segments (chapitres/articles 2 et 3), conformément à la recommandation d'opter pour des terrains autres que celui des États-Unis issue du chapitre/article 1, a permis de constituer un échantillon de 300 PME réparties dans diverses industries; dont 112 qui se sont avérées avoir un CA. Toutefois, tant les rouages en matière de gouvernance d'entreprise que les enjeux autour de l'innovation sont sensibles aux variabilités contextuelles, dont celles qui relèvent des spécificités géographiques et sectorielles. Pour soutenir davantage la solidité des résultats et tendre vers un plus grand potentiel de généralisation, une réplique de cette recherche dans un contexte autre que celui du système de gouvernance anglo-saxon (p. ex. sur la base du modèle de gouvernance allemand ou japonais) pourrait être particulièrement instructive et ouvrirait la porte à des analyses comparatives riches. Dans cette continuité, le fait d'obtenir un plus grand nombre d'observations et une meilleure ventilation sectorielle serait également porteur d'une grande valeur ajoutée.

### **Brefs mots de conclusion d'ordre général**

Cette thèse doctorale contribue à l'avancement des connaissances dans le domaine de la stratégie, plus précisément en se concentrant sur le groupe décisionnel représentant le plus haut échelon stratégique (c.-à-d. le CA) et une retombée organisationnelle de nature stratégique (c.-à-d. l'innovation) dans un contexte où la portée stratégique de chacun de ces deux concepts a fait ses preuves (c.-à-d. celui des PME). Ce faisant, cet ouvrage scientifique aspire à façonner tant la réflexion des chercheurs que les initiatives des dirigeants et les actions des décideurs politiques en ce qui a trait au cheminement vers trois finalités ralliant l'ensemble de ces principaux acteurs économiques de la société : une saine gouvernance, un haut degré d'innovation et la pérennité des PME. Finalement, il convient de conclure par une ouverture et de « boucler la boucle » en greffant les principaux éléments qui composent la conclusion générale à la structure détaillée de la thèse doctorale apparaissant à l'introduction générale (figure 8); ce qui permet ultimement de clôturer par la présentation d'une série de pistes recherche prometteuses.

**Figure 8.** Rappel de la structure et boucle finale de la thèse doctorale



## **Bibliographie (conclusion générale)**

- Åberg, C., Bankewitz, M., & Knockaert, M. (2019). Service tasks of board of directors: A literature review and research agenda in an era of new governance practices. *European Management Journal*, 37, 648-663.
- Aaboen, L., Lindelof, P., Christopher von, K., & Lofsten, H. (2006). Corporate governance and performance of small high-tech firms in Sweden. *Technovation*, 26, 955-968.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Baker, H. K., Pandey, N., Kumar, S., & Haldar, A. (2020). A bibliometric analysis of board diversity: Current status, development, and future research directions. *Journal of Business Research*, 108, 232-246.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, 127, 588-612.
- Bezemer, P. J., Pugliese, A., Nicholson, G., & Zattoni, A. (2022). Toward a synthesis of the board-strategy relationship: A literature review and future research agenda. *Corporate Governance: An International Review* (in press).
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.
- Bonini, S., & Lagasio, V. (2022). Board meetings dynamics and information diffusion. *Corporate Governance: An International Review*, 30, 96-119.
- Bravo, F., & Reguera-Alvarado, N. (2017). The effect of board of directors on R&D intensity: board tenure and multiple directorships. *R&D Management*, 47, 701-714.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Burns, T., & Stalker, G. M. 1961. *The management of innovation*. London: Tavistock.
- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.
- Chen, C. J., Lin, B. W., Lin, Y. H., & Hsiao, Y. C. (2016). Ownership structure, independent board members and innovation performance: A contingency perspective. *Journal of Business Research*, 69, 3371-3379.
- Cuomo, F., Mallin, C., & Zattoni, A. (2016). Corporate governance codes: A review and research agenda. *Corporate Governance: An International Review*, 24, 222-241.
- De Massis, A., Frattini, F., Kotlar, J., Petruzzelli, A. M., & Wright, M. (2016). Innovation through tradition: Lessons from innovative family businesses and directions for future research. *Academy of Management Perspectives*, 30, 93-116.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14, 57-74.
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate Governance: An International Review*, 11, 102-111.

- Federo, R., Ponomareva, Y., Aguilera, R. V., Saz-Carranza, A., & Losada, C. (2020). Bringing owners back on board: A review of the role of ownership type in board governance. *Corporate Governance: An International Review*, 28, 348-371.
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- García-Ramos, R., & Díaz, B. D. (2021). Board of directors structure and firm financial performance: A qualitative comparative analysis. *Long Range Planning*, 54, 102017.
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Gonzales-Bustos, J. P., & Hernández-Lara, A. B. (2016). Corporate governance and innovation: A systematic literature review. *Corporate Ownership and Control*, 13, 33-45.
- Gurtner, S., & Reinhardt, R. (2016). Ambidextrous idea generation—Antecedents and outcomes. *Journal of Product Innovation Management*, 33, 34-54.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37, 235-256.
- Honoré, F., Munari, F., & de La Potterie, B. V. P. (2015). Corporate governance practices and companies' R&D intensity: Evidence from European countries. *Research Policy*, 44, 533-543.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Kauffman, S. A. (1993). *The origins of order: Self-organization and selection in evolution*. Oxford University Press, USA.
- Khanna, P., Jones, C. D., & Boivie, S. (2014). Director human capital, information processing demands, and board effectiveness. *Journal of Management*, 40, 557-585.
- Kirsch, A. (2018). The gender composition of corporate boards: A review and research agenda. *The Leadership Quarterly*, 29, 346-364.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Lim, E. N., & McCann, B. T. (2014). Performance feedback and firm risk taking: The moderating effects of CEO and outside director stock options. *Organization Science*, 25, 262-282.

- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Ma, S., Seidl, D., & McNulty, T. (2021). Challenges and practices of interviewing business elites. *Strategic Organization*, 19, 81-96.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The impact of family ownership, management, and governance on innovation. *Journal of Product Innovation Management*, 32, 319-333.
- McCann, B. T., & Bahl, M. (2017). The influence of competition from informal firms on new product development. *Strategic Management Journal*, 38, 1518-1535.
- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management Studies*, 46, 755-786.
- Misangyi, V. F., Greckhamer, T., Furnari, S., Fiss, P. C., Crilly, D., & Aguilera, R. (2017). Embracing causal complexity: The emergence of a neo-configurational perspective. *Journal of Management*, 43, 255-282.
- Nicholson, G. J., & Kiel, G. C. (2004). A framework for diagnosing board effectiveness. *Corporate Governance: An International Review*, 12, 442-460.
- Nguyen, T. H. H., Ntim, C. G., & Malagila, J. K. (2020). Women on corporate boards and corporate financial and non-financial performance: A systematic literature review and future research agenda. *International Review of Financial Analysis*, 71, 1-24.
- Panayi, E., Bozos, K., & Veronesi, G. (2021). Corporate governance “bundles” and firm acquisitiveness. *Corporate Governance: An International Review*, 29, 402-426.
- Payne, G. T., Benson, G. S., & Finegold, D. L. (2009). Corporate board attributes, team effectiveness and financial performance. *Journal of Management Studies*, 46, 704-731.
- Pearce II, J. A., & Patel, P. C. (2018). Board of director efficacy and firm performance variability. *Long Range Planning*, 51, 911-926.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, 13, 5-16.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Pugliese, A., Nicholson, G., & Bezemer, P. J. (2015). An observational analysis of the impact of board dynamics and directors' participation on perceived board effectiveness. *British Journal of Management*, 26, 1-25.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the former CEO stays on board: The role of the predecessor's board retention for product innovation in family firms. *Journal of Product Innovation Management*, 37, 184-207.
- Robeson, D., & O'Connor, G. C. (2013). Boards of Directors, Innovation, and Performance: An Exploration at Multiple Levels. *Journal of Product Innovation Management*, 30, 608-625.
- Sena, V., Duygun, M., Lubrano, G., Marra, M., & Shaban, M. (2018). Board independence, corruption and innovation. Some evidence on UK subsidiaries. *Journal of Corporate Finance*, 50, 22-43.
- Schaedler, L., Graf-Vlachy, L., & König, A. (2021). Strategic leadership in organizational crises: A review and research agenda. *Long Range Planning* (in press), 102156.

- Schiehll, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly* (in press), 23409444211039856.
- Solarino, A. M., & Aguinis, H. (2021). Challenges and best-practice recommendations for designing and conducting interviews with elite informants. *Journal of Management Studies*, 58, 649-672.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate board interlocks and new product introductions. *Journal of Marketing*, 82(1), 132-148.
- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Thorgren, S., Wincent, J., & Anokhin, S. (2010). The importance of compensating strategic network board members for network performance: A contingency approach. *British Journal of Management*, 21, 131-151.
- Uhlaner, L., Massis, A. D., Jorissen, A., & Du, Y. (2021). Are outside directors on the small and medium-sized enterprise board always beneficial? Disclosure of firm-specific information in board-management relations as the missing mechanism. *Human Relations*, 74, 1781-1819.
- Veltrop, D. B., Bezemer, P. J., Nicholson, G., & Pugliese, A. (2021). Too unsafe to monitor? How board-CEO cognitive conflict and chair leadership shape outside director monitoring. *Academy of Management Journal*, 64, 207-234.
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zhu, H., Wang, P., & Bart, C. (2016). Board processes, board strategic involvement, and organizational performance in for-profit and non-profit organizations. *Journal of Business Ethics*, 136, 311-328.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24(3), 299-315.

# Bibliographie générale

## Section « introduction générale »

- Aghion, P., Bloom, N., Blundell, R., Griffith, R., & Howitt, P. (2005). Competition and innovation: An inverted-U relationship. *The Quarterly Journal of Economics*, 120, 701-728.
- Altomonte, C., Aquilante, T., Békés, G., & Ottaviano, G. I. (2013). Internationalization and innovation of firms: evidence and policy. *Economic Policy*, 28, 663-700.
- Andersén, J., & Ljungkvist, T. (2021). Resource orchestration for team-based innovation: a case study of the interplay between teams, customers, and top management. *R&D Management*, 51, 147-160.
- Appio, F. P., Frattini, F., Petruzzelli, A. M., & Neirotti, P. (2021). Digital transformation and innovation management: A synthesis of existing research and an agenda for future studies. *Journal of Product Innovation Management*, 38, 4-20.
- Argyres, N., Rios, L. A., & Silverman, B. S. (2020). Organizational change and the dynamics of innovation: Formal R&D structure and intrafirm inventor networks. *Strategic Management Journal*, 41, 2015-2049.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Bacq, S., & Aguilera, R. V. (2022). Stakeholder governance for responsible innovation: A theory of value creation, appropriation, and distribution. *Journal of Management Studies*, 59, 29-60.
- Balsmeier, B., Buchwald, A., & Stiebale, J. (2014). Outside directors on the board and innovative firm performance. *Research Policy*, 43, 1800-1815.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Bammens, Y., Voordeckers, W., & Van Gils, A. (2011). Boards of directors in family businesses: A literature review and research agenda. *International Journal of Management Reviews*, 13, 134-152.
- Barrett, G., Dooley, L., & Bogue, J. (2021). Open innovation within high-tech SMEs: A study of the entrepreneurial founder's influence on open innovation practices. *Technovation*, 103, 102232.
- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Baum, C. F., Lööf, H., Stephan, A., & Viklund-Ros, I. (2022). Innovation by start-up firms: The role of the board of directors for knowledge spillovers. *Research Policy*, 51, 104375.
- Baumann, J., & Kritikos, A. S. (2016). The link between R&D, innovation and productivity: Are micro firms different?. *Research Policy*, 45, 1263-1274.
- Bauweraerts, J., Rondi, E., Rovelli, P., De Massis, A., & Sciascia, S. (2022). Are family female directors catalysts of innovation in family small and medium enterprises?. *Strategic Entrepreneurship Journal* (in press).



- Baysinger, B. D., Kosnik, R. D., & Turk, T. A. (1991). Effects of board and ownership structure on corporate R&D strategy. *Academy of Management Journal*, 34, 205-214.
- Bellstam, G., Bhagat, S., & Cookson, J. A. (2021). A text-based analysis of corporate innovation. *Management Science*, 67, 4004-4031.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Berle, A.A., Means, G.C., 1932. *The Modern Corporation and Private Property*, New York.
- Bezemer, P. J., Pugliese, A., Nicholson, G., & Zattoni, A. (2022). Toward a synthesis of the board-strategy relationship: A literature review and future research agenda. *Corporate Governance: An International Review* (in press).
- Black, S. E., & Lynch, L. M. (2004). What's driving the new economy?: The benefits of workplace innovation. *The Economic Journal*, 114, 97-116.
- Boh, W. F., Huang, C. J., & Wu, A. (2020). Investor experience and innovation performance: The mediating role of external cooperation. *Strategic Management Journal*, 41, 124-151.
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.
- Bommaraju, R., Ahearne, M., Krause, R., & Tirunillai, S. (2019). Does a customer on the board of directors affect business-to-business firm performance?. *Journal of Marketing*, 83, 8-23.
- Boone, C., Lokshin, B., Guenter, H., & Belderbos, R. (2019). Top management team nationality diversity, corporate entrepreneurship, and innovation in multinational firms. *Strategic Management Journal*, 40, 277-302.
- Bosma, N., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, 51, 483-499.
- Boyd, B. K., Gove, S., & Solarino, A. M. (2017). Methodological rigor of corporate governance studies: A review and recommendations for future studies. *Corporate Governance: An International Review*, 25, 384-396.
- Brem, A., & Voigt, K. I. (2009). Integration of market pull and technology push in the corporate front end and innovation management—Insights from the German software industry. *Technovation*, 29, 351-367.
- Broadstock, D. C., Matousek, R., Meyer, M., & Tzeremes, N. G. (2020). Does corporate social responsibility impact firms' innovation capacity? The indirect link between environmental & social governance implementation and innovation performance. *Journal of Business Research*, 119, 99-110.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Bustanza, O. F., Gomes, E., Vendrell-Herrero, F., & Baines, T. (2019). Product–service innovation and performance: the role of collaborative partnerships and R&D intensity. *R&D Management*, 49, 33-45.
- Calabrò, A., & Mussolino, D. (2013). How do boards of directors contribute to family SME export intensity? The role of formal and informal governance mechanisms. *Journal of Management & Governance*, 17, 363-403.

- Candi, M., Melia, M., & Colurcio, M. (2019). Two birds with one stone: The quest for addressing both business goals and social needs with innovation. *Journal of Business Ethics*, 160, 1019-1033.
- Cassiman, B., & Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42, 56-75.
- Chen, S., Bu, M., Wu, S., & Liang, X. (2015). How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance. *Journal of Business Research*, 68, 1127-1135.
- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.
- Chemmanur, T. J., Gupta, M., & Simonyan, K. (2022). Top management team quality and innovation in venture-backed private firms and IPO market rewards to innovative activity. *Entrepreneurship Theory and Practice*, 46, 920-951.
- Chen, I. J., Hsu, P. H., & Wang, Y. (2022). Staggered boards and product innovations: Evidence from Massachusetts State Bill HB 5640. *Research Policy*, 51, 104475.
- Coad, A., Segarra, A., & Teruel, M. (2016). Innovation and firm growth: does firm age play a role?. *Research Policy*, 45, 387-400.
- Cortes, A. F., & Herrmann, P. (2020). CEO transformational leadership and SME innovation: The mediating role of social capital and employee participation. *International Journal of Innovation Management*, 24, 2050024.
- Cortes, A. F., & Herrmann, P. (2021). Strategic leadership of innovation: a framework for future research. *International Journal of Management Reviews*, 23, 224-243.
- Cragun, O. R., Olsen, K. J., & Wright, P. M. (2020). Making CEO narcissism research great: A review and meta-analysis of CEO narcissism. *Journal of Management*, 46, 908-936.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154-1191.
- Cucculelli, M., & Peruzzi, V. (2020). Innovation over the industry life-cycle. Does ownership matter?. *Research Policy*, 49, 103878.
- Dachs, B., & Peters, B. (2014). Innovation, employment growth, and foreign ownership of firms: A European perspective. *Research Policy*, 43, 214-232.
- Dalziel, T., Gentry, R. J., & Bowerman, M. (2011). An integrated agency–resource dependence view of the influence of directors' human and relational capital on firms' R&D spending. *Journal of Management Studies*, 48, 1217-1242.
- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34, 555-590.
- Damanpour, F., Sanchez-Henriquez, F., & Chiu, H. H. (2018). Internal and external sources and the adoption of innovations in organizations. *British Journal of Management*, 29, 712-730.
- Damanpour, F., Szabat, K. A., & Evan, W. M. (1989). The relationship between types of innovation and organizational performance. *Journal of Management Studies*, 26, 587-602.
- Dachs, B., & Peters, B. (2014). Innovation, employment growth, and foreign ownership of firms: A European perspective. *Research Policy*, 43, 214-232.
- Davis, P. E., & Bendickson, J. S. (2021). Strategic antecedents of innovation: Variance between small and large firms. *Journal of Small Business Management*, 59, 47-72.

- Deloitte (2020, december). 2021 Directors' alert: A new era of board stewardship begins. Disponible à travers le lien suivant : <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/audit/ca-en-Deloitte-DirectorsAlert-Edition1-AODA.pdf>.
- Deschamps, J. P. (2009). *Innovation leaders: How senior executives stimulate, steer and sustain innovation*. John Wiley & Sons.
- Deschamps, J. P., & Nelson, B. (2014). *Innovation governance: How top management organizes and mobilizes for innovation*. John Wiley & Sons.
- Dewangan, V., & Godse, M. (2014). Towards a holistic enterprise innovation performance measurement system. *Technovation*, 34, 536-545.
- Dey, P. K., Malesios, C., De, D., Chowdhury, S., & Abdelaziz, F. B. (2020). The impact of lean management practices and sustainably-oriented innovation on sustainability performance of small and medium-sized enterprises: empirical evidence from the UK. *British Journal of Management*, 31, 141-161.
- Díaz-Díaz, N. L., López-Iturriaga, F. J., & Santana-Martín, D. J. (2022). The role of political ties and political uncertainty in corporate innovation. *Long Range Planning*, 55, 102111.
- Dimitropoulos, P. E. (2020). R&D investments and profitability during the crisis: evidence from Greece. *R&D Management*, 50, 587-598.
- Do Adro, F. J. N., & Leitão, J. C. C. (2020). Leadership and organizational innovation in the third sector: A systematic literature review. *International Journal of Innovation Studies*, 4, 51-67.
- Dyer, J., Gregersen, H., & Christensen, C. M. (2011). *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators*. Harvard Business Press.
- Dziallas, M., & Blind, K. (2019). Innovation indicators throughout the innovation process: An extensive literature analysis. *Technovation*, 80, 3-29.
- Edquist, C. (2019). Towards a holistic innovation policy: Can the Swedish National Innovation Council (NIC) be a role model?. *Research Policy*, 48, 869-879.
- Ejdemo, T., & Örtqvist, D. (2020). Related variety as a driver of regional innovation and entrepreneurship: A moderated and mediated model with non-linear effects. *Research Policy*, 49, 104073.
- Ellwood, P., Williams, C., & Egan, J. (2022). Crossing the valley of death: Five underlying innovation processes. *Technovation*, 109, 102162.
- Elms, N., & Pugliese, A. (2022). Director tenure and contribution to board task performance: A time and contingency perspective. *Long Range Planning* (in press), 102217.
- Ettlie, J. E., Bridges, W. P., & O'keefe, R. D. (1984). Organization strategy and structural differences for radical versus incremental innovation. *Management Science*, 30, 682-695.
- Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26, 301-325.
- Freeman, R. E. 1984. *Strategic Management: A Stakeholder Approach*, Boston: Pitman Publishing Inc.
- Friedman, M. (1970). A theoretical framework for monetary analysis. *Journal of Political Economy*, 78, 193-238.
- Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: A literature review. *Journal of Product Innovation Management*, 19, 110-132.

- Garcia Martinez, M., Zouaghi, F., & Garcia Marco, T. (2017). Diversity is strategy: the effect of R&D team diversity on innovative performance. *R&D Management*, 47, 311-329.
- García-Ramos, R., & Díaz, B. D. (2021). Board of directors structure and firm financial performance: A qualitative comparative analysis. *Long Range Planning*, 54, 102017.
- Garg, S., & Furr, N. (2017). Venture boards: Past insights, future directions, and transition to public firm boards. *Strategic Entrepreneurship Journal*, 11, 326-343.
- Gault, F. (2018). Defining and measuring innovation in all sectors of the economy. *Research Policy*, 47, 617-622.
- Gouvernement du Québec (2022, mai). *Inventer, Développer, Commercialiser : Stratégie québécoise de développement et d'investissement en innovation 2022-2027*. Disponible à travers le lien suivant : <https://www.quebec.ca/gouvernement/ministere/economie/publications/strategie-quebecoise-de-recherche-et-dinvestissement-en-innovation-2022-2027>
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Griffin, D., Li, K., & Xu, T. (2021). Board gender diversity and corporate innovation: International evidence. *Journal of Financial and Quantitative Analysis*, 56, 123-154.
- Guo, H., Wang, C., Su, Z., & Wang, D. (2020). Technology push or market pull? Strategic orientation in business model design and digital start-up performance. *Journal of Product Innovation Management*, 37, 352-372.
- Gurtner, S., & Reinhardt, R. (2016). Ambidextrous idea generation—Antecedents and outcomes. *Journal of Product Innovation Management*, 33, 34-54.
- Haneda, S., & Ito, K. (2018). Organizational and human resource management and innovation: which management practices are linked to product and/or process innovation?. *Research Policy*, 47, 194-208.
- Hasan, I., & Tucci, C. L. (2010). The innovation—economic growth nexus: Global evidence. *Research Policy*, 39, 1264-1276.
- He, Z., & Hirshleifer, D. (2022). The exploratory mindset and corporate innovation. *Journal of Financial and Quantitative Analysis*, 57, 127-169.
- Heidenreich, S., & Kraemer, T. (2016). Innovations—doomed to fail? Investigating strategies to overcome passive innovation resistance. *Journal of Product Innovation Management*, 33, 277-297.
- Hervás-Oliver, J. L., Parrilli, M. D., Rodríguez-Pose, A., & Sempere-Ripoll, F. (2021). The drivers of SME innovation in the regions of the EU. *Research Policy*, 50, 104316.
- Hill, C. W., & Snell, S. A. (1988). External control, corporate strategy, and firm performance in research-intensive industries. *Strategic Management Journal*, 9, 577-590.
- Hill, L. A., & Davis, G. (2017). The board's new innovation imperative. *Harvard Business Review*, 95, 102-109.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28, 383-396.
- Hillman, A. J., Nicholson, G., & Shropshire, C. (2008). Directors' multiple identities, identification, and board monitoring and resource provision. *Organization Science*, 19, 441-456.

- Honoré, F., Munari, F., & de La Potterie, B. V. P. (2015). Corporate governance practices and companies' R&D intensity: Evidence from European countries. *Research Policy*, 44, 533-543.
- Huynh, K., Wilden, R., & Gudergan, S. (2022). The interface of the top management team and the board: A dynamic managerial capabilities perspective. *Long Range Planning* (in press), 102194.
- Howells, J. (2005). Innovation and regional economic development: A matter of perspective?. *Research Policy*, 34, 1220-1234.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3, 305-360.
- Jia, N., Huang, K. G., & Man Zhang, C. (2019). Public governance, corporate governance, and firm innovation: An examination of state-owned enterprises. *Academy of Management Journal*, 62, 220-247.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Judge Jr, W. Q., & Zeithaml, C. P. (1992). Institutional and strategic choice perspectives on board involvement in the strategic decision process. *Academy of Management Journal*, 35, 766-794.
- Kannan-Narasimhan, R., & Lawrence, B. S. (2018). How innovators reframe resources in the strategy-making process to gain innovation adoption. *Strategic Management Journal*, 39, 720-758.
- Keum, D. D., & See, K. E. (2017). The influence of hierarchy on idea generation and selection in the innovation process. *Organization Science*, 28, 653-669.
- Keupp, M. M., Palmié, M., & Gassmann, O. (2012). The strategic management of innovation: A systematic review and paths for future research. *International Journal of Management Reviews*, 14, 367-390.
- Klijn, E., Reuer, J. J., Volberda, H. W., & Van Den Bosch, F. A. (2019). Ex-post governance in joint ventures: Determinants of monitoring by JV boards of directors. *Long Range Planning*, 52, 72-85.
- Klarner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Klingebiel, R., & Rammer, C. (2014). Resource allocation strategy for innovation portfolio management. *Strategic Management Journal*, 35, 246-268.
- Kobarg, S., Stumpf-Wollersheim, J., & Welp, I. M. (2019). More is not always better: Effects of collaboration breadth and depth on radical and incremental innovation performance at the project level. *Research Policy*, 48, 1-10.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- KPMG (2020, septembre). Innovation trends 2020. KPMG Digital Delta. Disponible à travers le lien suivant : <https://assets.kpmg/content/dam/kpmg/au/pdf/2020/digital-innovation-trends-survey-2020.pdf>.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.

- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Lahiri, A., Pahnke, E. C., Howard, M. D., & Boeker, W. (2019). Collaboration and informal hierarchy in innovation teams: Product introductions in entrepreneurial ventures. *Strategic Entrepreneurship Journal*, 13, 326-358.
- Leblanc, R., & Schwartz, M. S. (2007). The black box of board process: Gaining access to a difficult subject. *Corporate Governance: An International Review*, 15, 843-851.
- Leiponen, A., & Helfat, C. E. (2010). Innovation objectives, knowledge sources, and the benefits of breadth. *Strategic Management Journal*, 31, 224-236.
- Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18, 399-429.
- Longoni, A., & Cagliano, R. (2018). Sustainable innovativeness and the triple bottom line: The role of organizational time perspective. *Journal of Business Ethics*, 151, 1097-1120.
- Lu, J., & Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, 48, 1-16.
- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & Van Auken, H. (2013). An investigation of Spanish SME innovation during different economic conditions. *Journal of Small Business Management*, 51, 578-601.
- Madsen, T. L., & Leiblein, M. J. (2015). What factors affect the persistence of an innovation advantage?. *Journal of Management Studies*, 52, 1097-1127.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The impact of family ownership, management, and governance on innovation. *Journal of Product Innovation Management*, 32, 319-333.
- McDermott, C. M., & O'Connor, G. C. (2002). Managing radical innovation: an overview of emergent strategy issues. *Journal of Product Innovation Management*, 19, 424-438.
- McGahan, A. M., Bogers, M. L., Chesbrough, H., & Holgersson, M. (2021). Tackling societal challenges with open innovation. *California Management Review*, 63, 49-61.
- McKinsey (2021). McKinsey Global Survey. Disponible à travers le lien suivant : <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/ourinsights/how-boards-have-risen-to-the-covid-19-challenge-and-whats-next>.
- McNulty, T., Zattoni, A., & Douglas, T. (2013). Developing corporate governance research through qualitative methods: A review of previous studies. *Corporate Governance: An International Review*, 21, 183-198.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.
- Ministère Innovation, Sciences et Développement économique Canada (2020, décembre). Rapport sur les résultats ministériel 2019-2020. Disponible à travers le lien suivant : <https://dec.canada.ca/fr/publications-ministerielles/rapport-sur-les-resultats-ministeriel-2019-2020/>.
- Ministère Innovation, Sciences et Développement économique Canada (2022, février). Rapport sur les résultats ministériel 2020-2021. Disponible à travers le lien suivant :



<https://dec.canada.ca/fr/publications-ministerielles/rapport-sur-les-resultats-ministeriels-2020-2021/>

- Mitra, A., Post, C., & Sauerwald, S. (2021). Evaluating board candidates: A threat-contingency model of shareholder dissent against female director candidates. *Organization Science*, 32, 86-110.
- Muñoz-Bullón, F., Sanchez-Bueno, M. J., & De Massis, A. (2020). Combining internal and external R&D: The effects on innovation performance in family and nonfamily firms. *Entrepreneurship Theory and Practice*, 44, 996-1031.
- Mutlu, C. C., Van Essen, M., Peng, M. W., Saleh, S. F., & Duran, P. (2018). Corporate governance in China: A meta-analysis. *Journal of Management Studies*, 55, 943-979.
- Nielsen, S., & Huse, M. (2010). The contribution of women on boards of directors: Going beyond the surface. *Corporate Governance: An International Review*, 18, 136-148.
- Oslo Manual/OECD (2018). Guidelines for Collecting, Reporting and Using Data on Innovation; OECD Publishing: Paris, France.
- Panayi, E., Bozos, K., & Veronesi, G. (2021). Corporate governance “bundles” and firm acquisitiveness. *Corporate Governance: An International Review*, 29, 402-426.
- Papanastassiou, M., Pearce, R., & Zanfei, A. (2020). Changing perspectives on the internationalization of R&D and innovation by multinational enterprises: A review of the literature. *Journal of International Business Studies*, 51, 623-664.
- Parrilli, M. D., Balavac, M., & Radicic, D. (2020). Business innovation modes and their impact on innovation outputs: Regional variations and the nature of innovation across EU regions. *Research Policy*, 49, 104047.
- Partanen, J., Chetty, S. K., & Rajala, A. (2014). Innovation types and network relationships. *Entrepreneurship Theory and Practice*, 38, 1027-1055.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pellegrino, G., & Savona, M. (2017). No money, no honey? Financial versus knowledge and demand constraints on innovation. *Research Policy*, 46, 510-521.
- Pérez, J. A. H., Geldes, C., Kunc, M. H., & Flores, A. (2019). New approach to the innovation process in emerging economies: The manufacturing sector case in Chile and Peru. *Technovation*, 79, 35-55.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Pugliese, A., Bezemer, P. J., Zattoni, A., Huse, M., Van den Bosch, F. A., & Volberda, H. W. (2009). Boards of directors' contribution to strategy: A literature review and research agenda. *Corporate Governance: An International Review*, 17, 292-306.
- Pugliese, A., Nicholson, G., & Bezemer, P. J. (2015). An observational analysis of the impact of board dynamics and directors' participation on perceived board effectiveness. *British Journal of Management*, 26, 1-25.
- Puthusserry, P., Khan, Z., Nair, S. R., & King, T. (2021). Mitigating psychic distance and enhancing internationalization of fintech SMEs from emerging markets: the role of board of directors. *British Journal of Management*, 32, 1097-1120.
- Razinskas, S., Weiss, M., Hoegl, M., & Baer, M. (2022). Illuminating opposing performance effects of stressors in innovation teams. *Journal of Product Innovation Management*, 39, 351-370.

- Roberts, P. W. (1999). Product innovation, product–market competition and persistent profitability in the US pharmaceutical industry. *Strategic Management Journal*, 20, 655-670.
- Robeson, D., & O'Connor, G. C. (2013). Boards of directors, innovation, and performance: An exploration at multiple levels. *Journal of Product Innovation Management*, 30, 608-625.
- Roelandt, J., Andries, P., & Knockaert, M. (2022). The contribution of board experience to opportunity development in high-tech ventures. *Small Business Economics*, 58, 1627-1645.
- Roffia, P., Simón-Moya, V., & Sendra García, J. (2021). Board of director attributes: effects on financial performance in SMEs. *International Entrepreneurship and Management Journal*, 1-32.
- Sapra, H., Subramanian, A., & Subramanian, K. V. (2014). Corporate governance and innovation: Theory and evidence. *Journal of Financial and Quantitative Analysis*, 49, 957-1003.
- Schiehll, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Schumpeter, J.A. (1934) *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press, Cambridge, MA.
- Schumpeter, J. A. (1939), *Business Cycle*, p. 103, McGraw-Hill Book Company, New York.
- Schumpeter, J. A. (1942). *Capitalism, Socialism, and pp. 511–528. Democracy*. Harper, New York.
- Schubert, T., & Tavassoli, S. (2020). Product innovation and educational diversity in top and middle management teams. *Academy of Management Journal*, 63, 272-294.
- Scoresby, R. B., Withers, M. C., & Ireland, R. D. (2021). The effect of CEO regulatory focus on changes to investments in R&D. *Journal of Product Innovation Management*, 38, 401-420.
- Sehnm, S., Provensi, T., da Silva, T. H. H., & Pereira, S. C. F. (2022). Disruptive innovation and circularity in start-ups: A path to sustainable development. *Business Strategy and the Environment*, 31, 1292-1307.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly* (in press),
- Sjödin, D., Parida, V., Jovanovic, M., & Visnjic, I. (2020). Value creation and value capture alignment in business model innovation: A process view on outcome-based business models. *Journal of Product Innovation Management*, 37, 158-183.
- Statistique Canada (2021, 27 juillet). Enquête sur l'innovation et les stratégies d'entreprise, 2017 à 2019. Statistique Canada. Disponible à travers le lien suivant : <https://www150.statcan.gc.ca/n1/pub/12-604-x/12-604-x2021001-fra.htm>.
- Statistique Québec (2021, 16 décembre). L'innovation dans les entreprises du Québec en 2017-2019. Statistique Québec. Disponible à travers le lien suivant : <https://statistique.quebec.ca/fr/document/innovation-entreprises-quebec-2017-2019>.
- Tzabbar, D., & Vestal, A. (2015). Bridging the social chasm in geographically distributed R&D teams: The moderating effects of relational strength and status asymmetry on the novelty of team innovation. *Organization Science*, 26, 811-829.



- Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58, 13-35.
- Tellis, G. J., Prabhu, J. C., & Chandy, R. K. (2009). Radical innovation across nations: The preeminence of corporate culture. *Journal of Marketing*, 73, 3-23.
- Vandenbroucke, E., Knockaert, M., & Ucbasaran, D. (2016). Outside board human capital and early stage high-tech firm performance. *Entrepreneurship Theory and Practice*, 40, 759-779.
- Van der Have, R. P., & Rubalcaba, L. (2016). Social innovation research: An emerging area of innovation studies?. *Research Policy*, 45, 1923-1935.
- Veltrop, D. B., Bezemer, P. J., Nicholson, G., & Pugliese, A. (2021). Too unsafe to monitor? How board-CEO cognitive conflict and chair leadership shape outside director monitoring. *Academy of Management Journal*, 64, 207-234.
- Wang, C., & Hu, Q. (2020). Knowledge sharing in supply chain networks: Effects of collaborative innovation activities and capability on innovation performance. *Technovation*, 94, 102010.
- Werner, A., Schröder, C., & Chlosta, S. (2018). Driving factors of innovation in family and non-family SMEs. *Small Business Economics*, 50, 201-218.
- Witt, M. A., Fainshmidt, S., & Aguilera, R. V. (2022). Our board, our rules: Nonconformity to global corporate governance norms. *Administrative Science Quarterly*, 67, 131-166.
- World Intellectual Property Organization (2021, septembre). The 2021 edition of the GII. Disponible à travers le lien suivant : [https://www.wipo.int/global\\_innovation\\_index/en/](https://www.wipo.int/global_innovation_index/en/).
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yi, J., Murphree, M., Meng, S., & Li, S. (2021). The more the merrier? Chinese government R&D subsidies, dependence, and firm innovation performance. *Journal of Product Innovation Management*, 38, 289-310.
- Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, 39, 1713-1735.
- Zahra, S. A., & Das, S. R. (1993). Innovation strategy and financial performance in manufacturing companies: An empirical study. *Production and Operations Management*, 2, 15-37.
- Zahra, S. A., & Filatotchev, I. (2004). Governance of the entrepreneurial threshold firm: A knowledge-based perspective. *Journal of Management Studies*, 41, 885-897.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zhu, H., & Yoshikawa, T. (2016). Contingent value of director identification: The role of government directors in monitoring and resource provision in an emerging economy. *Strategic Management Journal*, 37, 1787-1807.

Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24, 299-315.

## **Section « chapitre/article 1 »**

- Aaboen, L., Lindelof, P., Christopher von, K., & Lofsten, H. (2006). Corporate governance and performance of small high-tech firms in Sweden. *Technovation*, 26, 955-968.
- Åberg, C., Bankewitz, M., & Knockaert, M. (2019). Service tasks of board of directors: A literature review and research agenda in an era of new governance practices. *European Management Journal*, 37, 648-663.
- Aguilera, R. V., & Crespi-Cladera, R. (2016). Global corporate governance: On the relevance of firms' ownership structure. *Journal of World Business*, 51, 50-57.
- Almor, T., Bazel-Shoham, O., & Lee, S. M. (2019). The dual effect of board gender diversity on R&D investments. *Long Range Planning* (in press), 55, 101884.
- Attah-Boakyie, R., Adams, K., Kimani, D., & Ullah, S. (2020). The impact of board gender diversity and national culture on corporate innovation: A multi-country analysis of multinational corporations operating in emerging economies. *Technological Forecasting and Social Change*, 161, 120247.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Ashwin, A. S., Krishnan, R. T., & George, R. (2015). Family firms in India: Family involvement, innovation and agency and stewardship behaviors. *Asia Pacific Journal of Management*, 32, 869-900.
- Bacq, S., & Aguilera, R. V. (2022). Stakeholder governance for responsible innovation: A theory of value creation, appropriation, and distribution. *Journal of Management Studies*, 59, 29-60.
- Baker, H. K., Pandey, N., Kumar, S., & Haldar, A. (2020). A bibliometric analysis of board diversity: Current status, development, and future research directions. *Journal of Business Research*, 108, 232-246.
- Balsmeier, B., Buchwald, A., & Stiebale, J. (2014). Outside directors on the board and innovative firm performance. *Research Policy*, 43, 1800-1815.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Banbury, C. M., & Mitchell, W. (1995). The effect of introducing important incremental innovations on market share and business survival. *Strategic Management Journal*, 16, 161-182.
- Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference?. *Strategic Management Journal*, 10, 107-124.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, 27, 643-650.

- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Baumann, J., & Kritikos, A. S. (2016). The link between R&D, innovation and productivity: Are micro firms different?. *Research Policy*, 45, 1263-1274.
- Baysinger, B. D., Kosnik, R. D., & Turk, T. A. (1991). Effects of board and ownership structure on corporate R&D strategy. *Academy of Management Journal*, 34, 205-214.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Benkraiem, R., Boubaker, S., Brinette, S., & Khemiri, S. (2021). Board feminization and innovation through corporate venture capital investments: The moderating effects of independence and management skills. *Technological Forecasting and Social Change* (in press), 163, 120467.
- Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, 127, 588-612.
- Bezemer, P. J., Pugliese, A., Nicholson, G., & Zattoni, A. (2022). Toward a synthesis of the board-strategy relationship: A literature review and future research agenda. *Corporate Governance: An International Review* (in press).
- Black, S. E., & Lynch, L. M. (2004). What's driving the new economy?: The benefits of workplace innovation. *The Economic Journal*, 114, 97-116.
- Bommaraju, R., Ahearne, M., Krause, R., & Tirunillai, S. (2019). Does a Customer on the Board of Directors Affect Business-to-Business Firm Performance? *Journal of Marketing*, 83, 8-23.
- Bosse, D. A., & Phillips, R. A. (2016). Agency theory and bounded self-interest. *Academy of Management Review*, 41, 276-297.
- Boyd, B. K., Gove, S., & Solarino, A. M. (2017). Methodological rigor of corporate governance studies: A review and recommendations for future studies. *Corporate Governance: An International Review*, 25, 384-396.
- Boyd, B. K., & Solarino, A. M. (2016). Ownership of corporations: A review, synthesis, and research agenda. *Journal of Management*, 42, 1282-1314.
- Bravo, F., & Reguera-Alvarado, N. (2017). The effect of board of directors on R&D intensity: board tenure and multiple directorships. *R&D Management*, 47, 701-714.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Burns, T., & Stalker, G. M. (1961). *The management of innovation*. London: Tavistock.
- Camisón-Zornoza, C., Lapiedra-Alcamí, R., Segarra-Ciprés, M., & Boronat-Navarro, M. (2004). A meta-analysis of innovation and organizational size. *Organization Studies*, 25, 331-361.
- Cai, J., & Nguyen, T. (2018). Disciplinary directors: Evidence from the appointments of outside directors who have fired CEOs. *Journal of Banking & Finance*, 96, 221-235.
- Canil, J., Karpavičius, S., & Yu, C. F. (2021). TMT gender diversity: implications for corporate tournaments and innovation. *The European Journal of Finance*, 27, 1765-1790.
- Cao, S., Fang, Z., Pu, W., & Ruan, Y. Y. (2021). Vertical Interlock and Firm Value: The Role of Corporate Innovation. *Emerging Markets Finance and Trade*, 58, 1061-1077.

- Cassiman, B., & Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42, 56-75.
- Cefis, E., & Marsili, O. (2006). Survivor: The role of innovation in firms' survival. *Research Policy*, 35, 626-641.
- Cefis, E., & Marsili, O. (2019). Good times, bad times: innovation and survival over the business cycle. *Industrial and Corporate Change*, 28, 565-587.
- Celikyurt, U., Sevilir, M., & Shivdasani, A. (2014). Venture Capitalists on Boards of Mature Public Firms. *Review of Financial Studies*, 27, 56-101.
- Certo, S. T., Lester, R. H., Dalton, C. M., & Dalton, D. R. (2006). Top management teams, strategy and financial performance: A meta-analytic examination. *Journal of Management Studies*, 43, 813-839.
- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.
- Chen, J. (2020). A juggling act: CEO polychronicity and firm innovation. *The Leadership Quarterly*, 101380.
- Chen, C. J., Lin, B. W., Lin, Y. H., & Hsiao, Y. C. (2016). Ownership structure, independent board members and innovation performance: A contingency perspective. *Journal of Business Research*, 69, 3371-3379.
- Chen, H. L. (2014). Board Capital, CEO Power and R&D Investment in Electronics Firms. *Corporate Governance-an International Review*, 22, 422-436.
- Chen, H. L., Ho, M. H. C., & Hsu, W. T. (2013). Does board social capital influence chief executive officers' investment decisions in research and development? *R&D Management*, 43, 381-393.
- Chen, H. L., & Hsu, W. T. (2009). Family Ownership, Board Independence, and R&D Investment. *Family Business Review*, 22, 347-362.
- Chen, J., Leung, W. S., & Evans, K. P. (2018). Female board representation, corporate innovation and firm performance. *Journal of Empirical Finance*, 48, 236-254.
- Chen, S. M., Bu, M., Wu, S. B., & Liang, X. (2015). How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance. *Journal of Business Research*, 68, 1127-1135.
- Chen, S. M., Ni, X., & Tong, J. Y. (2016). Gender Diversity in the Boardroom and Risk Management: A Case of R&D Investment. *Journal of Business Ethics*, 136, 599-621.
- Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics*, 87, 157-176.
- Choi, J., Rhee, M., & Kim, Y. C. (2019). Performance feedback and problemistic search: The moderating effects of managerial and board outsidersness. *Journal of Business Research*, 102, 21-33.
- Chuluun, T., Prevost, A., & Upadhyay, A. (2017). Firm network structure and innovation. *Journal of Corporate Finance*, 44, 193-214.
- Coad, A., Segarra, A., & Teruel, M. (2016). Innovation and firm growth: does firm age play a role?. *Research Policy*, 45, 387-400.
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics*, 87, 329-356.
- Cook, A., & Glass, C. (2015). Do minority leaders affect corporate practice? Analyzing the effect of leadership composition on governance and product development. *Strategic Organization*, 13, 117-140.

- Crescenzi, R., & Gagliardi, L. (2018). The innovative performance of firms in heterogeneous environments: The interplay between external knowledge and internal absorptive capacities. *Research Policy*, 47, 782-795.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47, 1154-1191.
- Cumming, D., & Leung, T. Y. (2021). Board diversity and corporate innovation: Regional demographics and industry context. *Corporate Governance: An International Review*, 29, 277-296.
- Cuomo, F., Mallin, C., & Zattoni, A. (2016). Corporate governance codes: A review and research agenda. *Corporate Governance: An International Review*, 24, 222-241.
- Dalziel, T., Gentry, R. J., & Bowerman, M. (2011). An Integrated Agency-Resource Dependence View of the Influence of Directors' Human and Relational Capital on Firms' R&D Spending. *Journal of Management Studies*, 48, 1217-1242.
- Damanpour, F. (1992). Organizational size and innovation. *Organization Studies*, 13, 375-402.
- Dangelico, R. M. (2016). Green product innovation: where we are and where we are going. *Business Strategy and the Environment*, 25, 560-576.
- David, P., Hitt, M. A., & Gimeno, J. (2001). The influence of activism by institutional investors on R&D. *Academy of Management Journal*, 44, 144-157.
- Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Davis, Schoorman, and Donaldson reply: The distinctiveness of agency theory and stewardship theory. *Academy of Management Review*, 22, 611-613.
- Demirag, I. S. (1998). Boards of Directors' short-term perceptions and evidence of managerial short-termism in the UK. *European Journal of Finance*, 4, 195-211.
- Denyer, D. and Tranfield, D. (2009), Producing a systematic review, in Buchanan, D. and Bryman, A. (Eds), *The Sage Handbook of Organizational Research Methods*, Sage Publications, London.
- Deutsch, Y. (2007). The influence of outside directors' stock-option compensation on firms' R&D. *Corporate Governance: An International Review*, 15, 816-827.
- Díaz-Díaz, N. L., López-Iturriaga, F. J., & Santana-Martín, D. J. (2021). The role of political ties and political uncertainty in corporate innovation. *Long Range Planning* (in press), 55, 102111.
- Diestre, L., Rajagopalan, N., & Dutta, S. (2015). Constraints in acquiring and utilizing directors' 218overnance: An empirical study of new-market entry in the pharmaceutical industry. *Strategic Management Journal*, 36, 339-359.
- Donaldson, L. (2001). *The contingency theory of organizations*. Sage.
- Donaldson, L., & Davis, J. H. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management*, 16, 49-64.
- Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review*, 20, 65-91.
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate governance: An International Review*, 11, 102-111.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14, 57-74.
- Faley, O., Hoitash, R., & Hoitash, U. (2011). The costs of intense board monitoring. *Journal of Financial Economics*, 101, 160-181.

- Faleye, O., Hoitash, R., & Hoitash, U. (2018). Industry expertise on corporate boards. *Review of Quantitative Finance and Accounting*, 50, 441-479.
- Faleye, O., Kung, W., Parwada, J. T., & Tian, G. Y. (2020). Are entrepreneurs special? Evidence from board appointments. *Journal of Business Venturing*, 35, 106003.
- Feldman, M. P. (1993). An examination of the geography of innovation. *Industrial and Corporate Change*, 2, 451-470.
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- Foss, N. J., Klein, P. G., Lien, L. B., Zellweger, T., & Zenger, T. (2021). Ownership competence. *Strategic Management Journal*, 42, 302-328.
- Francis, B., Hasan, I., & Wu, Q. (2015). Professors in the Boardroom and Their Impact on Corporate Governance and Firm Performance. *Financial Management*, 44, 547-581.
- Freeman, R. E. (1999). Divergent stakeholder theory. *Academy of Management Review*, 24, 233-236.
- Freeman, R. E., & Reed, D. L. (1983). Stockholders and stakeholders: A new perspective on corporate governance. *California Management Review*, 25, 88-106.
- García-Sánchez, I. M., Gallego-Álvarez, I., & Zafra-Gómez, J. L. (2021). Do independent, female and specialist directors promote eco-innovation and eco-design in agri-food firms?. *Business Strategy and the Environment*, 30, 1136-1152.
- Ge, W. X., & Kim, J. B. (2014). Boards, takeover protection, and real earnings management. *Review of Quantitative Finance and Accounting*, 43, 651-682.
- Ghosh, S. (2016). Banker on board and innovative activity. *Journal of Business Research*, 69, 4205-4214.
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Griffin, D., Li, K., & Xu, T. (2021). Board gender diversity and corporate innovation: International evidence. *Journal of Financial and Quantitative Analysis*, 56, 123-154.
- Guldiken, O., & Darendeli, I. S. (2016). Too much of a good thing: Board monitoring and R&D investments. *Journal of Business Research*, 69, 2931-2938.
- Hill, L. A., & Davis, G. (2017). The board's new innovation imperative. *Harvard Business Review*, 95, 102-109.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9, 193-206.
- Han, J., Bose, I., Hu, N., Qi, B. L., & Tian, G. L. (2015). Does director interlock impact corporate R&D investment? *Decision Support Systems*, 71, 28-36.
- Harjoto, M. A., Laksmana, I., & Yang, Y. W. (2018). Board diversity and corporate investment oversight. *Journal of Business Research*, 90, 40-47.
- Hasan, I., & Tucci, C. L. (2010). The innovation-economic growth nexus: Global evidence. *Research Policy*, 39, 1264-127.
- Haynes, K. T., & Hillman, A. (2010). The effect of board capital and CEO power on strategic change. *Strategic Management Journal*, 31, 1145-1163.

- Haxhi, I., & Aguilera, R. V. (2017). An institutional configurational approach to cross-national diversity in corporate governance. *Journal of Management Studies*, 54, 261-303.
- He, X. P., & Jiang, S. (2019). Does gender diversity matter for green innovation? *Business Strategy and the Environment*, 28, 1341-1356.
- Helmers, C., Patnam, M., & Rau, P. R. (2017). Do board interlocks increase innovation? Evidence from a corporate governance reform in India. *Journal of Banking & Finance*, 80, 51-70.
- Hill, C. W., & Snell, S. A. (1988). External control, corporate strategy, and firm performance in research-intensive industries. *Strategic Management Journal*, 9, 577-590.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37, 235-256.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28, 383-396.
- Hillman, A. J., Nicholson, G., & Shropshire, C. (2008). Directors' multiple identities, identification, and board monitoring and resource provision. *Organization Science*, 19, 441-456.
- Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource dependence theory: A review. *Journal of Management*, 35, 1404-1427.
- Horbach, J., & Jacob, J. (2018). The relevance of personal characteristics and gender diversity for (eco-)innovation activities at the firm-level: Results from a linked employer–employee database in Germany. *Business Strategy and the Environment*, 27, 924-934.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Grossman, W. (2002). Conflicting voices: The effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, 45, 697-716.
- Huergo, E., & Jaumandreu, J. (2004). How does probability of innovation change with firm age?. *Small Business Economics*, 22, 193-207.
- Hung, K. P., & Chou, C. (2013). The impact of open innovation on firm performance: The moderating effects of internal R&D and environmental turbulence. *Technovation*, 33, 368-380.
- Iyer, S. R., Sankaran, H., & Zhang, Y. (2020). Do Well-Connected Boards Invest Optimally In R&D Activities?. *Journal of Financial Research*, 43, 895-932.
- Jansson, E. (2005). The stakeholder model: the influence of the ownership and governance structures. *Journal of Business Ethics*, 56, 1-13.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Jensen, M., & Zajac, E. J. (2004). Corporate elites and corporate strategy: How demographic preferences and structural position shape the scope of the firm. *Strategic Management Journal*, 25, 507-524.
- Jia, N. (2017). Should Directors Have Term Limits? – Evidence from Corporate Innovation. *European Accounting Review*, 26, 755-785.

- Jiang, F., Shi, W., & Zheng, X. (2020). Board chairs and R&D investment: Evidence from Chinese family-controlled firms. *Journal of Business Research*, 112, 109-118.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Jugend, D., Jabbour, C. J. C., Scaliza, J. A. A., Rocha, R. S., Junior, J. A. G., Latan, H., & Salgado, M. H. (2018). Relationships among open innovation, innovative performance, government support and firm size: Comparing Brazilian firms embracing different levels of radicalism in innovation. *Technovation*, 74, 54-65.
- Kang, J. K., Liu, W. L., Low, A., & Zhang, L. (2018). Friendly boards and innovation. *Journal of Empirical Finance*, 45, 1-25.
- Kang, S., Kim, E. H., & Lu, Y. (2018). Does Independent Directors' CEO Experience Matter? *Review of Finance*, 22, 905-949.
- Katila, R., Thatchenkery, S., Christensen, M. Q., & Zenios, S. (2017). Is there a doctor in the house? Expert product users, organizational roles and innovation. *Academy of Management Journal*, 60, 2415-2437.
- Khanna, P., Jones, C. D., & Boivie, S. (2014). Director human capital, information processing demands, and board effectiveness. *Journal of Management*, 40, 557-585.
- Kim, H., Park, N. K., & Lee, J. (2014). How does the second-order learning process moderate the relationship between innovation inputs and outputs of large Korean firms? *Asia Pacific Journal of Management*, 31, 69-103.
- Kirsch, A. (2018). The gender composition of corporate boards: A review and research agenda. *The Leadership Quarterly*, 29, 346-364.
- Kitchenham, B. (2004). Procedures for performing systematic reviews. Keele, UK, Keele University, 33, 1-26.
- Ko, Y. J., O'Neill, H., & Xie, X. (2021). Strategic intent as a contingency of the relationship between external knowledge and firm innovation. *Technovation* (in press), 104, 102260.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- Kor, Y. Y., & Sundaramurthy, C. (2009). Experience-based human capital and social capital of outside directors. *Journal of Management*, 35, 981-1006.
- Klarner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18, 399-429.
- Leung, T. Y., & Sharma, P. (2021). Differences in the impact of R&D intensity and R&D internationalization on firm performance—Mediating role of innovation performance. *Journal of Business Research*, 131, 81-91.
- Li, M. X. (2019). Diversity of Board Interlocks and the Impact on Technological Exploration: A Longitudinal Study. *Journal of Product Innovation Management*, 36, 490-512.



- Li, Y. X., & He, C. (2021). Board diversity and corporate innovation: Evidence from Chinese listed firms. *International Journal of Finance & Economics*, 1-24.
- Li, J., Li, M., Wang, X., & Thatcher, J. B. (2021). Strategic Directions for AI: The Role of CIOs and Boards of Directors. *Management Information Systems Quarterly*, 45, 1603-1644.
- Liang, Q., Li, X. C., Yang, X. R., Lin, D. M., & Zheng, D. H. (2013). How does family involvement affect innovation in China? *Asia Pacific Journal of Management*, 30, 677-695.
- Lim, E. N. K. (2015). The role of reference point in CEO restricted stock and its impact on R&D intensity in high-technology firms. *Strategic Management Journal*, 36, 872-889.
- Lim, E. N. K., & McCann, B. T. (2014). Performance Feedback and Firm Risk Taking: The Moderating Effects of CEO and Outside Director Stock Options. *Organization Science*, 25, 262-282.
- Lin, W.-C., & Chang, S.-c. (2012). Corporate governance and the stock market reaction to new product announcements. *Review of Quantitative Finance and Accounting*, 39, 273-291.
- Lu, J., & Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, 48, 1-16.
- Lu, J., Mahmoudian, F., Yu, D., Nazari, J. A., & Herremans, I. M. (2021). Board interlocks, absorptive capacity, and environmental performance. *Business Strategy and the Environment*, 30, 3425-3443.
- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Ma, S., Kor, Y. Y., & Seidl, D. (2020). CEO advice seeking: An integrative framework and future research agenda. *Journal of Management*, 46, 771-805.
- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & Van Auken, H. (2013). An investigation of Spanish SME innovation during different economic conditions. *Journal of Small Business Management*, 51, 578-601.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The Impact of Family Ownership, Management, and Governance on Innovation. *Journal of Product Innovation Management*, 32, 319-333.
- Mazzola, E., Perrone, G., & Kamuriwo, D. S. (2016). The interaction between inter-firm and interlocking directorate networks on firm's new product development outcomes. *Journal of Business Research*, 69, 672-682.
- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management Studies*, 46, 755-786.
- Miller, D., & Toulouse, J. M. (1986). Chief executive personality and corporate strategy and structure in small firms. *Management Science*, 32, 1389-1409.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.
- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., ... & Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4, 1-9.
- Muth, M., & Donaldson, L. (1998). Stewardship theory and board structure: A contingency approach. *Corporate Governance: An International Review*, 6, 5-28.

- Nadeem, M., Bahadar, S., Gull, A. A., & Iqbal, U. (2020). Are women eco-friendly? Board gender diversity and environmental innovation. *Business Strategy and the Environment*, 29, 3146-3161.
- Narayan, S., Sidhu, J. S., & Volberda, H. W. (2021). From attention to action: The influence of cognitive and ideological diversity in top management teams on business model innovation. *Journal of Management Studies*, 58, 2082-2110.
- Nguyen, T. H. H., Ntim, C. G., & Malagila, J. K. (2020). Women on corporate boards and corporate financial and non-financial performance: A systematic literature review and future research agenda. *International Review of Financial Analysis*, 71, 1-24.
- OECD (2021). *SME and Entrepreneurship Outlook 2021*. Disponible à travers le lien suivant : <https://www.oecd.org/publications/oecd-sme-and-entrepreneurship-outlook-2021-97a5bbfe-en.htm>
- Osma, B. G. (2008). Board independence and real earnings management: The case of R&D expenditure. *Corporate Governance: An International Review*, 16, 116-131.
- Paik, Y., & Woo, H. (2017). The effects of corporate venture capital, founder incumbency, and their interaction on entrepreneurial firms' R&D investment strategies. *Organization Science*, 28, 670-689.
- Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know?. *International Business Review*, 29, 101717.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pellegrino, G., & Savona, M. (2017). No money, no honey? Financial versus knowledge and demand constraints on innovation. *Research Policy*, 46, 510-521.
- Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, 13, 5-16.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Post, C., Sarala, R., Gatrell, C., & Prescott, J. E. (2020). Advancing theory with review articles. *Journal of Management Studies*, 57, 351-376.
- Priem, R. L., & Butler, J. E. (2001). Is the resource-based "view" a useful perspective for strategic management research?. *Academy of Management Review*, 26, 22-40.
- Pugliese, A., Bezemer, P. J., Zattoni, A., Huse, M., Van den Bosch, F. A., & Volberda, H. W. (2009). Boards of directors' contribution to strategy: A literature review and research agenda. *Corporate Governance: An International Review*, 17, 292-306.
- Purkayastha, S., Manolova, T. S., & Edelman, L. F. (2018). Business group effects on the R&D intensity-internationalization relationship: Empirical evidence from India. *Journal of World Business*, 53, 104-117.
- Qian, C., Cao, Q., & Takeuchi, R. (2013). Top management team functional diversity and organizational innovation in China: The moderating effects of environment. *Strategic Management Journal*, 34, 110-120.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the former CEO stays on board: The role of the predecessor's board retention for product innovation in family firms. *Journal of Product Innovation Management*, 37, 184-207.

- Rasmussen, C. C., Ladegård, G., & Korhonen-Sande, S. (2018). Growth intentions and board composition in high-growth firms. *Journal of Small Business Management*, 56, 601-617.
- Ravasi, D., & Zattoni, A. (2006). Exploring the political side of board involvement in strategy: A study of mixed-ownership institutions. *Journal of Management Studies*, 43, 1671-1702.
- Roberts, P. W. (1999). Product innovation, product–market competition and persistent profitability in the US pharmaceutical industry. *Strategic Management Journal*, 20, 655-670.
- Robeson, D., & O'Connor, G. C. (2013). Boards of Directors, Innovation, and Performance: An Exploration at Multiple Levels. *Journal of Product Innovation Management*, 30, 608-625.
- Rodrigues, R., Samagaio, A., & Felício, T. (2020). Corporate governance and R&D investment by European listed companies. *Journal of Business Research*, 115, 289-295.
- Sariol, A. M., & Abebe, M. A. (2017). The influence of CEO power on explorative and exploitative organizational innovation. *Journal of Business Research*, 73, 38-45.
- Schaedler, L., Graf-Vlachy, L., & König, A. (2021). Strategic leadership in organizational crises: A review and research agenda. *Long Range Planning* (in press), 102156.
- Schiehl, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, Pivot and Advisory Boards: The Role of Governance Configurations in Innovation Commitment. *Organization Studies*, 39, 1449-1472.
- Schilke, O. (2018). A micro-institutional inquiry into resistance to environmental pressures. *Academy of Management Journal*, 61, 1431-1466.
- Schumpeter, J.A. (1934) *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle.* Harvard University Press, Cambridge, MA
- Sena, V., Duygun, M., Lubrano, G., Marra, M., & Shaban, M. (2018). Board independence, corruption and innovation. Some evidence on UK subsidiaries. *Journal of Corporate Finance*, 50, 22-43.
- Shaikh, I. A., O'Brien, J. P., & Peters, L. (2018). Inside directors and the underinvestment of financial slack towards R&D-intensity in high-technology firms. *Journal of Business Research*, 82, 192-201.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly*, 1-26.
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333-339.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate Board Interlocks and New Product Introductions. *Journal of Marketing*, 82, 132-148.
- Staples, M., & Niazi, M. (2007). Experiences using systematic review guidelines. *Journal of Systems and Software*, 80, 1425-1437.
- Stevenson, W. B., & Radin, R. F. (2009). Social capital and social influence on the board of directors. *Journal of Management Studies*, 46, 16-44.
- Talke, K., Salomo, S., & Rost, K. (2010). How top management team diversity affects innovativeness and performance via the strategic choice to focus on innovation fields. *Research Policy*, 39, 907-918.

- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Thorgren, S., Wincent, J., & Anokhin, S. (2010). The importance of compensating strategic network board members for network performance: a contingency approach. *British Journal of Management*, 21, 131-151.
- Torchia, M., Calabro, A., & Huse, M. (2011). Women Directors on Corporate Boards: From Tokenism to Critical Mass. *Journal of Business Ethics*, 102, 299-317.
- Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review*, 15, 404-428.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14, 207-222.
- Tylecote, A., & Ramirez, P. (2006). Corporate governance and innovation: The UK compared with the US and 'insider' economies. *Research Policy*, 35, 160-180.
- Usman, M., Javed, M., & Yin, J. (2020). Board internationalization and green innovation. *Economics Letters*, 197, 109625.
- Vandenbroucke, E., Knockaert, M., & Ucbasaran, D. (2016). Outside Board Human Capital and Early Stage High-Tech Firm Performance. *Entrepreneurship: Theory and Practice*, 40, 759-779.
- Von Zedtwitz, M., Corsi, S., Sjøberg, P. V., & Frega, R. (2015). A typology of reverse innovation. *Journal of Product Innovation Management*, 32, 12-28.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5, 171-180.
- Weimer, J., & Pape, J. (1999). A taxonomy of systems of corporate governance. *Corporate Governance: An International Review*, 7, 152-166.
- Wincent, J., Anokhin, S., & Boter, H. (2009). Network board continuity and effectiveness of open innovation in Swedish strategic small-firm networks. *R&D Management*, 39, 55-67.
- Wincent, J., Anokhin, S., & Ortqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME networks. *Journal of Business Research*, 63, 265-275.
- Wincent, J., Anokhin, S., & Ortqvist, D. (2013). Supporting innovation in government-sponsored networks: The role of network board composition. *International Small Business Journal-Researching Entrepreneurship*, 31, 997-1020.
- Wincent, J., Thorgren, S., & Anokhin, S. (2013). Managing Maturing Government-Supported Networks: The Shift from Monitoring to Embeddedness Controls. *British Journal of Management*, 24, 480-497.
- Weiss, M., Hoegl, M., & Gibbert, M. (2011). Making virtue of necessity: The role of team climate for innovation in resource-constrained innovation projects. *Journal of Product Innovation Management*, 28, 196-207.
- Wu, H-L. (2008). How do Board-CEO Relationships Influence the Performance of New Product Introduction? Moving from Single to Interdependent Explanations. *Corporate Governance: An International Review*, 16, 77-89.
- Wu, H. L. (2008). When does internal governance make firms innovative? *Journal of Business Research*, 61, 141-153.

- Wu, J., & Wu, Z. F. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yoo, T., & Sung, T. (2015). How outside directors facilitate corporate R&D investment? Evidence from large Korean firms. *Journal of Business Research*, 68, 1251-1260.
- Yoon, B., Jeong, Y., Lee, K., & Lee, S. (2020). A systematic approach to prioritizing R&D projects based on customer-perceived value using opinion mining. *Technovation*, 98, 102164.
- Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, 39, 1713-1735.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zenou, E., Allemand, I., Brullebaut, B., & Galia, F. (2020). Board recruitment as a strategic answer: Do companies' strategies for innovation influence the selection of new board members?. *Strategic Change*, 29, 127-139.
- Zhang, Q., Chen, L. L., & Feng, T. J. (2014). Mediation or Moderation? The Role of R&D Investment in the Relationship between Corporate Governance and Firm Performance: Empirical Evidence from the Chinese IT Industry. *Corporate Governance: An International Review*, 22, 501-517.
- Zona, F. (2012). Corporate Investing as a Response to Economic Downturn: Prospect Theory, the Behavioural Agency Model and the Role of Financial Slack. *British Journal of Management*, 23, 42-57.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.
- Zona, F., & Zamarian, M. (2022). The Behavioral Agency Model and Innovation Investment: Examining the Combined Effects of CEO and Board Ownership. *Group & Organization Management*, 47, 647-678.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A Contingency Model of Boards of Directors and Firm Innovation: The Moderating Role of Firm Size. *British Journal of Management*, 24, 299-315.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.

## **Section « chapitre/article 2 »**

- Aaboen, L., Lindelöf, P., Von Koch, C., & Löfsten, H. (2006). Corporate governance and performance of small high-tech firms in Sweden. *Technovation*, 26, 955-968.
- Adams, R. B., & Ferreira, D. (2007). A theory of friendly boards. *The Journal of Finance*, 62, 217-250.
- Adams, R. B., Hermalin, B. E., & Weisbach, M. S. (2010). The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, 48, 58-107.

- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Bahl, M., Lahiri, S., & Mukherjee, D. (2021). Managing internationalization and innovation tradeoffs in entrepreneurial firms: Evidence from transition economies. *Journal of World Business*, 56, 101150.
- Baldenius, T., Melumad, N., & Meng, X. (2014). Board composition and CEO power. *Journal of Financial Economics*, 112, 53-68.
- Balsmeier, B., Buchwald, A., & Stiebale, J. (2014). Outside directors on the board and innovative firm performance. *Research Policy*, 43, 1800-1815.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Bammens, Y., Voordeckers, W., & Van Gils, A. (2011). Boards of directors in family businesses: A literature review and research agenda. *International Journal of Management Reviews*, 13, 134-152.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Barroso-Castro, C., Villegas, M. M., & Pérez-Calero, L. (2011). Board influence on a firm's internationalization. *Corporate Governance: An International Review*, 19, 351-367.
- Battaglia, D., & Neirotti, P. (2022). Dealing with the tensions between innovation and internationalization in SMEs: A dynamic capability view. *Journal of Small Business Management*, 60, 379-419.
- Baum, C. F., Lööf, H., Stephan, A., & Viklund-Ros, I. (2022). Innovation by start-up firms: The role of the board of directors for knowledge spillovers. *Research Policy* (in press), 51, 104375.
- Baumann, J., & Kritikos, A. S. (2016). The link between R&D, innovation and productivity: Are micro firms different?. *Research Policy*, 45, 1263-1274.
- Bauweraerts, J., Rondi, E., Rovelli, P., De Massis, A., & Sciascia, S. (2022). Are family female directors catalysts of innovation in family small and medium enterprises?. *Strategic Entrepreneurship Journal*, 16, 314-354.
- Baysinger, B. D., Kosnik, R. D., & Turk, T. A. (1991). Effects of board and ownership structure on corporate R&D strategy. *Academy of Management Journal*, 34, 205-214.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The Effect of Family Involvement on Innovation Outcomes: The Moderating Role of Board Social Capital. *Journal of Product Innovation Management*, 37, 249-272.
- Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods & Research*, 16, 78-117.
- Bernard, D., Blackburne, T., & Thornock, J. (2020). Information flows among rivals and corporate investment. *Journal of Financial Economics*, 136, 760-779.
- Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, 127, 588-612.
- Bianchi, M., Croce, A., Dell'Era, C., Di Benedetto, C. A., & Frattini, F. (2016). Organizing for inbound open innovation: how external consultants and a dedicated R&D unit

- influence product innovation performance. *Journal of Product Innovation Management*, 33, 492-510.
- Bjornali, E. S., Knockaert, M., & Erikson, T. (2016). The impact of top management team characteristics and board service involvement on team effectiveness in high-tech start-ups. *Long Range Planning*, 49, 447-463.
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.
- Bommaraju, R., Ahearne, M., Krause, R., & Tirunillai, S. (2019). Does a customer on the board of directors affect business-to-business firm performance?. *Journal of Marketing*, 83, 8-23.
- Boomsma, A. (1985). Nonconvergence, Improper Solutions, and Starting Values in LISREL Maximum Likelihood Estimation. *Psychometrika*, 50, 229-242
- Bonesso, S., Gerli, F., Pizzi, C., & Boyatzis, R. E. (2020). The role of intangible human capital in innovation diversification: linking behavioral competencies with different types of innovation. *Industrial and Corporate Change*, 29, 661-681.
- Bonini, S., Deng, J., Ferrari, M., John, K., & Ross, D. G. (2022). Long-tenured independent directors and firm performance. *Strategic Management Journal*, 43, 1602-1634.
- Bonini, S., & Lagasio, V. (2022). Board meetings dynamics and information diffusion. *Corporate Governance: An International Review*, 30, 96-119.
- Boyd, B. K. (1995). CEO duality and firm performance: A contingency model. *Strategic Management Journal*, 16, 301-312.
- Bradshaw, P., Murray, V., & Wolpin, J. (1992). Do nonprofit boards make a difference? An exploration of the relationships among board structure, process, and effectiveness. *Nonprofit and Voluntary Sector Quarterly*, 21, 227-249.
- Bravo, F., & Reguera-Alvarado, N. (2017). The effect of board of directors on R&D intensity: board tenure and multiple directorships. *R&D Management*, 47, 701-714.
- Brown, A. B., Dai, J., & Zur, E. (2019). Too busy or well-connected? Evidence from a shock to multiple directorships. *The Accounting Review*, 94, 83-104.
- Bruneel, J., Clarysse, B., & Autio, E. (2018). The role of prior domestic experience and prior shared experience in young firm internationalization. *International Small Business Journal*, 36, 265-284.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Burns, T., & Stalker, G. M. 1961. *The management of innovation*. London: Tavistock.
- Calabrò, A., & Mussolino, D. (2013). How do boards of directors contribute to family SME export intensity? The role of formal and informal governance mechanisms. *Journal of Management & Governance*, 17, 363-403.
- Calabrò, A., Torchia, M., Jimenez, D. G., & Kraus, S. (2021). The role of human capital on family firm innovativeness: the strategic leadership role of family board members. *International Entrepreneurship and Management Journal*, 17, 261-287.
- Camisón-Zornoza, C., Lapiedra-Alcamí, R., Segarra-Ciprés, M., & Boronat-Navarro, M. (2004). A meta-analysis of innovation and organizational size. *Organization Studies*, 25, 331-361.
- Chandy, R. K., & Tellis, G. J. (2000). The incumbent's curse? Incumbency, size, and radical product innovation. *Journal of Marketing*, 64, 1-17.

- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.
- Chemmanur, T. J., Gupta, M., & Simonyan, K. (2020). Top management team quality and innovation in venture-backed private firms and IPO market rewards to innovative activity. *Entrepreneurship Theory and Practice*, 46, 920–951.
- Chen, H. L. (2014). Board capital, CEO power and R&D investment in electronics firms. *Corporate Governance: An International Review*, 22, 422-436.
- Chen, S., Bu, M., Wu, S., & Liang, X. (2015). How does TMT attention to innovation of Chinese firms influence firm innovation activities? A study on the moderating role of corporate governance. *Journal of Business Research*, 68, 1127-1135.
- Chen, J., Leung, W. S., & Evans, K. P. (2018). Female board representation, corporate innovation and firm performance. *Journal of Empirical Finance*, 48, 236-254.
- Chen, C. J., Lin, B. W., Lin, Y. H., & Hsiao, Y. C. (2016). Ownership structure, independent board members and innovation performance: A contingency perspective. *Journal of Business Research*, 69, 3371-3379.
- Cheng, L., Xie, E., Fang, J., & Mei, N. (2022). Performance feedback and firms' relative strategic emphasis: The moderating effects of board independence and media coverage. *Journal of Business Research*, 139, 218-231.
- Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics*, 87, 157-176.
- Coad, A. (2019). Persistent heterogeneity of R&D intensities within sectors: Evidence and policy implications. *Research Policy*, 48, 37-50.
- Cohen, W. M., & Levinthal, D. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35, 128-152.
- Colclough, S. N., Moen, Ø., Hovd, N. S., & Chan, A. (2019). SME innovation orientation: Evidence from Norwegian exporting SMEs. *International Small Business Journal*, 37, 780-803.
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all?. *Journal of Financial Economics*, 87, 329-356.
- Conyon, M. J., & Peck, S. I. (1998). Board control, remuneration committees, and top management compensation. *Academy of Management Journal*, 41, 146-157.
- Cornforth, C. (2001). What Makes Boards Effective? An examination of the relationships between board inputs, structures, processes and effectiveness in non-profit organisations. *Corporate Governance: An International Review*, 9, 217-227.
- Crucke, S., & Knockaert, M. (2016). When stakeholder representation leads to faultlines. A study of board service performance in social enterprises. *Journal of Management Studies*, 53, 768-793.
- Dalton, D. R., Daily, C. M., Johnson, J. L., & Ellstrand, A. E. (1999). Number of directors and financial performance: A meta-analysis. *Academy of Management Journal*, 42, 674-686.
- Dalziel, T., Gentry, R. J., & Bowerman, M. (2011). An integrated agency–resource dependence view of the influence of directors' human and relational capital on firms' R&D spending. *Journal of Management Studies*, 48, 1217-1242.
- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34, 555-590.
- Damanpour, F. (1992). Organizational size and innovation. *Organization Studies*, 13, 375-402.



- Dasilas, A., & Papasyriopoulos, N. (2015). Corporate governance, credit ratings and the capital structure of Greek SME and large listed firms. *Small Business Economics*, 45, 215-244.
- De Andres, P., & Vallelado, E. (2008). Corporate governance in banking: The role of the board of directors. *Journal of Banking & Finance*, 32, 2570-2580.
- De Jong, J. P. (2013). The decision to exploit opportunities for innovation: a study of high-tech small-business owners. *Entrepreneurship Theory and Practice*, 37, 281-301.
- De Massis, A., Frattini, F., Kotlar, J., Petruzzelli, A. M., & Wright, M. (2016). Innovation through tradition: Lessons from innovative family businesses and directions for future research. *Academy of Management Perspectives*, 30, 93-116.
- Deschamps, J. P., & Nelson, B. (2014). *Innovation governance: How top management organizes and mobilizes for innovation*. John Wiley & Sons.
- Deutsch, Y. (2007). The influence of outside directors' stock-option compensation on firms' R&D. *Corporate Governance: An International Review*, 15, 816-827.
- Diestre, L., Rajagopalan, N., & Dutta, S. (2015). Constraints in acquiring and utilizing directors' experience: An empirical study of new-market entry in the pharmaceutical industry. *Strategic Management Journal*, 36, 339-359.
- DiMasi, J. A., Grabowski, H. G., & Hansen, R. W. (2016). Innovation in the pharmaceutical industry: New estimates of R&D costs. *Journal of Health Economics*, 100, 20-33.
- Donaldson, L. (2001). *The contingency theory of organizations*. Sage.
- Donaldson, L., & Davis, J. H. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management*, 16, 49-64.
- Driver, C., & Guedes, M. J. C. (2012). Research and development, cash flow, agency and governance: UK large companies. *Research Policy*, 41, 1565-1577.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14, 57-74.
- Ejdemo, T., & Örtqvist, D. (2020). Related variety as a driver of regional innovation and entrepreneurship: A moderated and mediated model with non-linear effects. *Research Policy*, 49, 104073.
- Eliëns, R., Eling, K., Gelper, S., & Langerak, F. (2018). Rational versus intuitive gatekeeping: Escalation of commitment in the front end of NPD. *Journal of Product Innovation Management*, 35, 890-907.
- El Shoubaki, A., Laguir, I., & Den Besten, M. (2020). Human capital and SME growth: The mediating role of reasons to start a business. *Small Business Economics*, 54, 1107-1121.
- Elyasiani, E., & Zhang, L. (2015). Bank holding company performance, risk, and “busy” board of directors. *Journal of Banking & Finance*, 60, 239-251.
- Faleye, O., Hoitash, R., & Hoitash, U. (2011). The costs of intense board monitoring. *Journal of Financial Economics*, 101, 160-181.
- Faleye, O., Hoitash, R., & Hoitash, U. (2018). Industry expertise on corporate boards. *Review of Quantitative Finance and Accounting*, 50, 441-479.
- Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26, 301-325.
- Field, L., Lowry, M., & Mkrтчyan, A. (2013). Are busy boards detrimental?. *Journal of Financial Economics*, 109, 63-82.
- Filatotchev, I., Aguilera, R. V., & Wright, M. (2020). From governance of innovation to innovations in governance. *Academy of Management Perspectives*, 34, 173-181.

- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39-50.
- Freel, M. S. (2000). Do small innovating firms outperform non-innovators?. *Small Business Economics*, 14, 195-210.
- Freixanet, J., Rialp, A., & Churakova, I. (2020). How do innovation, internationalization, and organizational learning interact and co-evolve in small firms? a complex systems approach. *Journal of Small Business Management*, 58, 1030-1063.
- Fulmer, I. S., & Ployhart, R. E. (2014). “Our Most Important Asset” a multidisciplinary/multilevel review of human capital valuation for research and practice. *Journal of Management*, 40, 161-192.
- Garcia Osma, B. (2008). Board Independence and Real Earnings Management: The Case of R&D Expenditure. *Corporate Governance: An International Review*, 16, 116-131.
- Garms, F. P., & Engelen, A. (2019). Innovation and R&D in the Upper Echelons: The Association between the CTO's Power Depth and Breadth and the TMT's Commitment to Innovation. *Journal of Product Innovation Management*, 36, 87-106.
- Gimenez-Fernandez, E. M., Sandulli, F. D., & Bogers, M. (2020). Unpacking liabilities of newness and smallness in innovative start-ups: Investigating the differences in innovation performance between new and older small firms. *Research Policy*, 49, 104049.
- Gómez-Mejía, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly*, 52, 106-137.
- Goodstein, J., Gautam, K., & Boeker, W. (1994). The effects of board size and diversity on strategic change. *Strategic Management Journal*, 15, 241-250.
- Guldiken, O., & Darendeli, I. S. (2016). Too much of a good thing: Board monitoring and R&D investments. *Journal of Business Research*, 69, 2931-2938.
- Gurtner, S., & Reinhardt, R. (2016). Ambidextrous idea generation—Antecedents and outcomes. *Journal of Product Innovation Management*, 33, 34-54.
- Hagen, B., Zucchella, A., Cerchiello, P., & De Giovanni, N. (2012). International strategy and performance—Clustering strategic types of SMEs. *International Business Review*, 21, 369-382.
- Hair, J.F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V.G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research”, *European Business Review*, 26, 106-121.
- Harjoto, M. A., Laksmana, I., & Lee, R. (2015). Board diversity and corporate social responsibility. *Journal of Business Ethics*, 132, 641-660.
- Harjoto, M. A., Laksmana, I., & Yang, Y. W. (2018). Board diversity and corporate investment oversight. *Journal of Business Research*, 90, 40-47.
- Link, A. N., & van Hasselt, M. (2020). Exploring the impact of R&D on patenting activity in small women-owned and minority-owned entrepreneurial firms. *Small Business Economics*, 54, 1061-1066.
- Hauser, R. (2018). Busy directors and firm performance: Evidence from mergers. *Journal of Financial Economics*, 128, 16-37.

- Haynes, K. T., & Hillman, A. (2010). The effect of board capital and CEO power on strategic change. *Strategic Management Journal*, 31, 1145-1163.
- He, X., & Jiang, S. (2019). Does gender diversity matter for green innovation?. *Business Strategy and the Environment*, 28, 1341-1356.
- Helmers, C., Patnam, M., & Rau, P. R. (2017). Do board interlocks increase innovation? Evidence from a corporate governance reform in India. *Journal of Banking & Finance*, 80, 51-70.
- Hermalin, B. E., & Weisbach, M. S. (1998). Endogenously chosen boards of directors and their monitoring of the CEO. *American Economic Review*, 88, 96-118.
- Hervas-Oliver, J. L., Sempere-Ripoll, F., & Boronat-Moll, C. (2014). Process innovation strategy in SMEs, organizational innovation and performance: a misleading debate?. *Small Business Economics*, 43, 873-886.
- Heyden, M. L., Oehmichen, J., Nichting, S., & Volberda, H. W. (2015). Board background heterogeneity and exploration-exploitation: The role of the institutionally adopted board model. *Global Strategy Journal*, 5, 154-176.
- Hill, C. W., & Snell, S. A. (1988). External control, corporate strategy, and firm performance in research-intensive industries. *Strategic Management Journal*, 9, 577-590.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37, 235-256.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28, 383-396.
- Hillman, A. J., Nicholson, G., & Shropshire, C. (2008). Directors' multiple identities, identification, and board monitoring and resource provision. *Organization Science*, 19, 441-456.
- Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource dependence theory: A review. *Journal of Management*, 35, 1404-1427.
- Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal*, 39, 1084-1119.
- Horbach, J., & Jacob, J. (2018). The relevance of personal characteristics and gender diversity for (eco-) innovation activities at the firm-level: Results from a linked employer–employee database in Germany. *Business Strategy and the Environment*, 27, 924-934.
- Hoskisson, R. E., Hitt, M. A., & Hill, C. W. (1993). Managerial incentives and investment in R&D in large multiproduct firms. *Organization Science*, 4, 325-341.
- Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Grossman, W. (2002). Conflicting voices: The effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, 45, 697-716.
- Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1994). Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance. *Academy of Management Journal*, 37, 1207-1251.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.

- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Guo, H., Tang, J., Su, Z., & Katz, J. A. (2017). Opportunity recognition and SME performance: The mediating effect of business model innovation. *R&D Management*, 47, 431-442.
- Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, 48, 831-880.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Johannisson, B., & Huse, M. (2000). Recruiting outside board members in the small family business: An ideological challenge. *Entrepreneurship & Regional Development*, 12, 353-378.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Judge Jr, W. Q., & Zeithaml, C. P. (1992). Institutional and strategic choice perspectives on board involvement in the strategic decision process. *Academy of Management Journal*, 35, 766-794.
- Kafourous, M. I., Buckley, P. J., Sharp, J. A., & Wang, C. (2008). The role of internationalization in explaining innovation performance. *Technovation*, 28, 63-74.
- Kang, J. K., Liu, W. L., Low, A., & Zhang, L. (2018). Friendly boards and innovation. *Journal of Empirical Finance*, 45, 1-25.
- Kang, R., & Zaheer, A. (2018). Determinants of alliance partner choice: Network distance, managerial incentives, and board monitoring. *Strategic Management Journal*, 39, 2745-2769.
- Katila, R., & Ahuja, G. (2002). Something old, something new: A longitudinal study of search behavior and new product introduction. *Academy of Management Journal*, 45, 1183-1194.
- Khanna, P., Jones, C. D., & Boivie, S. (2014). Director human capital, information processing demands, and board effectiveness. *Journal of Management*, 40, 557-585.
- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Klärner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- Kor, Y. Y., & Misangyi, V. F. (2008). Outside directors' industry-specific experience and firms' liability of newness. *Strategic Management Journal*, 29, 1345-1355.
- Kor, Y. Y., & Sundaramurthy, C. (2009). Experience-based human capital and social capital of outside directors. *Journal of Management*, 35, 981-1006.
- Kosnik, R. D. (1990). Effects of board demography and directors' incentives on corporate greenmail decisions. *Academy of Management Journal*, 33, 129-150.

- Knockaert, M., & Ucbasaran, D. (2013). The service role of outside boards in high tech start-ups: A resource dependency perspective. *British Journal of Management*, 24, 69-84.
- Kumar, P., Zattoni, A., Marinovic, I., Povel, P., Kosová, R., Sertsios, G., ... & Berkowitz, J. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18, 399-429.
- Li, H., Terjesen, S., & Umans, T. (2020). Corporate governance in entrepreneurial firms: a systematic review and research agenda. *Small Business Economics*, 54, 43-74.
- Li, M. (2019). Diversity of board interlocks and the impact on technological exploration: A longitudinal study. *Journal of Product Innovation Management*, 36, 490-512.
- Lim, E. N., & McCann, B. T. (2014). Performance feedback and firm risk taking: The moderating effects of CEO and outside director stock options. *Organization Science*, 25, 262-282.
- Lin, W. C., & Chang, S. C. (2012). Corporate governance and the stock market reaction to new product announcements. *Review of Quantitative Finance and Accounting*, 39, 273-291.
- Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. *The Business Lawyer*, 48, 59-77.
- Lorca, C., Sánchez-Ballesta, J. P., & García-Meca, E. (2011). Board effectiveness and cost of debt. *Journal of Business Ethics*, 100, 613-631.
- Love, J. H., & Roper, S. (2015). SME innovation, exporting and growth: A review of existing evidence. *International Small Business Journal*, 33, 28-48.
- Lu, J., & Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, 48, 1-16.
- Ma, J., & Khanna, T. (2016). Independent directors' dissent on boards: Evidence from listed companies in China. *Strategic Management Journal*, 37, 1547-1557.
- Machold, S., & Farquhar, S. S. (2013). Board task evolution: A longitudinal field study in the UK. *Corporate Governance: An International Review*, 21, 147-164.
- Machold, S., Huse, M., Minichilli, A., & Nordqvist, M. (2011). Board leadership and strategy involvement in small firms: A team production approach. *Corporate Governance: An International Review*, 19, 368-383.
- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & Van Auken, H. (2013). An investigation of Spanish SME innovation during different economic conditions. *Journal of Small Business Management*, 51, 578-601.
- Marvel, M. R., & Lumpkin, G. T. (2007). Technology entrepreneurs' human capital and its effects on innovation radicalness. *Entrepreneurship: Theory and Practice*, 31, 807-828.
- Masulis, R. W., & Zhang, E. J. (2019). How valuable are independent directors? Evidence from external distractions. *Journal of Financial Economics*, 132, 226-256.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The impact of family ownership, management, and governance on innovation. *Journal of Product Innovation Management*, 32, 319-333.
- Mazzola, E., Perrone, G., & Kamuriwo, D. S. (2016). The interaction between inter-firm and interlocking directorate networks on firm's new product development outcomes. *Journal of Business Research*, 69, 672-682.

- McNulty, T., & Pettigrew, A. (1999). Strategists on the board. *Organization Studies*, 20, 47-74.
- McNulty, T., Zattoni, A., & Douglas, T. (2013). Developing corporate governance research through qualitative methods: A review of previous studies. *Corporate Governance: An International Review*, 21, 183-198.
- Mei, L., Zhang, T., & Chen, J. (2019). Exploring the effects of inter-firm linkages on SMEs' open innovation from an ecosystem perspective: An empirical study of Chinese manufacturing SMEs. *Technological Forecasting and Social Change*, 144, 118-128.
- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management studies*, 46, 755-786.
- Milliken, F. J., & Vollrath, D. A. (1991). Strategic decision-making tasks and group effectiveness: Insights from theory and research on small group performance. *Human Relations*, 44, 1229-1253.
- Mínguez-Vera, A., & Martin, A. (2011). Gender and management on Spanish SMEs: An empirical analysis. *The International Journal of Human Resource Management*, 22, 2852-2873.
- Minichilli, A., & Hansen, C. (2007). The board advisory tasks in small firms and the event of crises. *Journal of Management & Governance*, 11, 5-22.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.
- Nasirov, S., Li, Q. C., & Kor, Y. Y. (2021). Converting technological inventions into new products: The role of CEO human capital. *Journal of Product Innovation Management*, 38, 522-547.
- Oehmichen, J., Schrapp, S., & Wolff, M. (2017). Who needs experts most? Board industry expertise and strategic change—a contingency perspective. *Strategic Management Journal*, 38, 645-656.
- O'Neal, D., & Thomas, H. (1996). Developing the strategic board. *Long Range Planning*, 29, 314-327.
- Pang, C., & Wang, Y. (2020). Stock pledge, risk of losing control and corporate innovation. *Journal of Corporate Finance*, 60, 101534.
- Parmar, R., Mackenzie, I., Cohn, D., & Gann, D. (2014). The new patterns of innovation. *Harvard Business Review*, 92, 86-95
- Patel, P. C., & Chrisman, J. J. (2014). Risk abatement as a strategy for R&D investments in family firms. *Strategic Management Journal*, 35, 617-627.
- Payne, G. T., Benson, G. S., & Finegold, D. L. (2009). Corporate board attributes, team effectiveness and financial performance. *Journal of Management Studies*, 46, 704-731.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, 93, 44-54.

- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879.
- Prange, C., & Pinho, J. C. (2017). How personal and organizational drivers impact on SME international performance: The mediating role of organizational innovation. *International Business Review*, 26, 1114-1123.
- Protogerou, A., Caloghirou, Y., & Vonortas, N. S. (2017). Determinants of young firms' innovative performance: Empirical evidence from Europe. *Research Policy*, 46, 1312-1326.
- Provan, K. G. (1980). Board power and organizational effectiveness among human service agencies. *Academy of Management Journal*, 23, 221-236.
- Pugliese, A., Bezemer, P. J., Zattoni, A., Huse, M., Van den Bosch, F. A., & Volberda, H. W. (2009). Boards of directors' contribution to strategy: A literature review and research agenda. *Corporate Governance: An International Review*, 17, 292-306.
- Pugliese, A., & Wenstøp, P. Z. (2007). Board members' contribution to strategic decision-making in small firms. *Journal of Management & Governance*, 11, 383-404.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the Former CEO stays on Board: The Role of the Predecessor's Board Retention for Product Innovation in Family Firms. *Journal of Product Innovation Management*, 37, 184-207.
- Rasmussen, C. C., Ladegård, G., & Korhonen-Sande, S. (2018). Growth intentions and board composition in high-growth firms. *Journal of Small Business Management*, 56, 601-617.
- Ravasi, D., & Zattoni, A. (2006). Exploring the political side of board involvement in strategy: A study of mixed-ownership institutions. *Journal of Management Studies*, 43, 1671-1702.
- Raymond, L., & St-Pierre, J. (2010). R&D as a determinant of innovation in manufacturing SMEs: An attempt at empirical clarification. *Technovation*, 30, 48-56.
- Rindova, V. P. (1999). What corporate boards have to do with strategy: A cognitive perspective. *Journal of Management Studies*, 36, 953-975.
- Robeson, D., & O'Connor, G. C. (2013). Boards of directors, innovation, and performance: An exploration at multiple levels. *Journal of Product Innovation Management*, 30, 608-625.
- Rodríguez, A., & Nieto, M. J. (2016). Does R&D offshoring lead to SME growth? Different governance modes and the mediating role of innovation. *Strategic Management Journal*, 37, 1734-1753.
- Ruigrok, W., Peck, S. I., & Keller, H. (2006). Board characteristics and involvement in strategic decision making: Evidence from Swiss companies. *Journal of Management Studies*, 43, 1201-1226.
- Schiehll, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Sena, V., Duygun, M., Lubrano Lavadera, G., Marra, M., & Shaban, M. (2018). Board independence, corruption and innovation. Some evidence on UK subsidiaries. *Journal of Corporate Finance*, 50, 22-43.
- Shaikh, I. A., O'Brien, J. P., & Peters, L. (2018). Inside directors and the underinvestment of financial slack towards R&D-intensity in high-technology firms. *Journal of Business Research*, 82, 192-201.

- Sharma, V. (2011). Independent directors and the propensity to pay dividends. *Journal of Corporate Finance*, 17, 1001-1015.
- Singh, R. K., Garg, S. K., & Deshmukh, S. G. (2008). Strategy development by SMEs for competitiveness: a review. *Benchmarking: An International Journal*, 15, 525-547.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate board interlocks and new product introductions. *Journal of Marketing*, 82, 132-148.
- Stevenson, W. B., & Radin, R. F. (2009). Social capital and social influence on the board of directors. *Journal of Management Studies*, 46, 16-44.
- Stringer, R. (2000). How to manage radical innovation. *California Management Review*, 42, 70-88.
- Switzer, L. N., & Kelly, C. (2006). Corporate governance mechanisms and the performance of small-cap firms in Canada. *International Journal of Business Governance and Ethics*, 2, 294-328.
- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Thorgren, S., Wincent, J., & Anokhin, S. (2010). The importance of compensating strategic network board members for network performance: A contingency approach. *British Journal of Management*, 21, 131-151.
- Tian, J., Halebian, J., & Rajagopalan, N. (2011). The effects of board human and social capital on investor reactions to new CEO selection. *Strategic Management Journal*, 32, 731-747.
- Tranekjer, T. L., & Knudsen, M. P. (2012). The (unknown) providers to other firms' new product development: what's in it for them?. *Journal of Product Innovation Management*, 29, 986-999.
- Tzabbar, D., & Margolis, J. (2017). Beyond the startup stage: The founding team's human capital, new venture's stage of life, founder-CEO duality, and breakthrough innovation. *Organization Science*, 28, 857-872.
- Uhlaner, L., Wright, M., & Huse, M. (2007). Private firms and corporate governance: An integrated economic and management perspective. *Small Business Economics*, 29, 225-241.
- Umans, I., Lybaert, N., Steijvers, T., & Voordeckers, W. (2020). Succession planning in family firms: family governance practices, board of directors, and emotions. *Small Business Economics*, 54, 189-207.
- Vafeas, N. (2003). Length of board tenure and outside director independence. *Journal of Business Finance & Accounting*, 30, 1043-1064.
- Van den Berghe, L. A., & Levrau, A. (2004). Evaluating boards of directors: what constitutes a good corporate board?. *Corporate Governance: An International Review*, 12, 461-478.
- Vandenbroucke, E., Knockaert, M., & Ucbasaran, D. (2016). Outside board human capital and early stage high-tech firm performance. *Entrepreneurship Theory and Practice*, 40, 759-779.
- Van den Heuvel, J., Van Gils, A., & Voordeckers, W. (2006). Board roles in small and medium-sized family businesses: Performance and importance. *Corporate Governance: An International Review*, 14, 467-485.
- Van Gils, A. (2005). Management and governance in Dutch SMEs. *European Management Journal*, 23, 583-589.



- Veltrop, D. B., Hermes, N., Postma, T. J. B. M., & de Haan, J. (2015). A tale of two factions: Why and when factional demographic faultlines hurt board performance. *Corporate Governance: An International Review*, 23, 145-160.
- Wang, G., DeGhetto, K., Ellen, B. P., & Lamont, B. T. (2019). Board antecedents of CEO duality and the moderating role of country-level managerial discretion: a meta-analytic investigation. *Journal of Management Studies*, 56, 172-202.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5, 171-180.
- Wincent, J., Anokhin, S., & Örtqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME networks. *Journal of Business Research*, 63, 265-275.
- Wincent, J., Anokhin, S., & Örtqvist, D. (2013). Supporting innovation in government-sponsored networks: the role of network board composition. *International Small Business Journal*, 31, 997-1020.
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yoo, T., & Sung, T. (2015). How outside directors facilitate corporate R&D investment? Evidence from large Korean firms. *Journal of Business Research*, 68, 1251-1260.
- Zahra, S. A. (1996). Governance, ownership, and corporate entrepreneurship: The moderating impact of industry technological opportunities. *Academy of Management Journal*, 39, 1713-1735.
- Zahra, S. A., & Filatotchev, I. (2004). Governance of the entrepreneurial threshold firm: A knowledge-based perspective. *Journal of Management Studies*, 41, 885-897.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., Neubaum, D. O., & Naldi, L. (2007). The effects of ownership and governance on SMEs' international knowledge-based resources. *Small Business Economics*, 29, 309-327.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zarutskie, R. (2010). The role of top management team human capital in venture capital markets: Evidence from first-time funds. *Journal of Business Venturing*, 25, 155-172.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zattoni, A., Witt, M. A., Judge, W. Q., Talaulicar, T., Chen, J. J., Lewellyn, K., et al. (2017). Does board independence influence financial performance in IPO firms? The moderating role of the national business system. *Journal of World Business*, 52, 628-639.
- Zhu, D. H., & Shen, W. (2016). Why do some outside successions fare better than others? The role of outside CEOs' prior experience with board diversity. *Strategic Management Journal*, 37, 2695-2708.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.

- Zona, F., & Zattoni, A. (2007). Beyond the black box of demography: Board processes and task effectiveness within Italian firms. *Corporate Governance: An International Review*, 15, 852-864.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24, 299-315.

### **Section « chapitre/article 3 »**

- Allemand, I., Bédard, J., Brullebaut, B., & Deschênes, J. (2022). Role of old boys' networks and regulatory approaches in selection processes for female directors. *British Journal of Management*, 33, 784-805.
- Almor, T., Bazel-Shoham, O., & Lee, S. M. (2019). The dual effect of board gender diversity on R&D investments. *Long Range Planning*, 101884.
- Anderson, B. S., & Eshima, Y. (2013). The influence of firm age and intangible resources on the relationship between entrepreneurial orientation and firm growth among Japanese SMEs. *Journal of Business Venturing*, 28, 413-429.
- Anderson, R. C., & Reeb, D. M. (2004). Board composition: Balancing family influence in S&P 500 firms. *Administrative Science Quarterly*, 49, 209-237.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Balsmeier, B., Fleming, L., & Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, 123, 536-557.
- Bammens, Y., Voordeckers, W., & Van Gils, A. (2011). Boards of directors in family businesses: A literature review and research agenda. *International Journal of Management Reviews*, 13, 134-152.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- Barroso-Castro, C., Domínguez-CC, M., & Rodríguez-Serrano, M. Á. (2022). SME growth speed: The relationship with board capital. *Journal of Small Business Management*, 60, 480-512.
- Baum, C. F., Lööf, H., Stephan, A., & Viklund-Ros, I. (2022). Innovation by start-up firms: The role of the board of directors for knowledge spillovers. *Research Policy*, 51, 104375.
- Bauweraerts, J., Pongelli, C., Sciascia, S., Mazzola, P., & Minichilli, A. (2021). Transforming entrepreneurial orientation into performance in family SMEs: are nonfamily CEOs better than family CEOs?. *Journal of Small Business Management*, 1-32.
- Bauweraerts, J., Sciascia, S., Naldi, L., & Mazzola, P. (2019). Family CEO and board service: Turning the tide for export scope in family SMEs. *International Business Review*, 28, 101583.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Bertschi-Michel, A., Sieger, P., & Kammerlander, N. (2021). Succession in family-owned SMEs: the impact of advisors. *Small Business Economics*, 56, 1531-1551.

- Bezemer, P. J., Nicholson, G., & Pugliese, A. (2018). The influence of board chairs on director engagement: A case-based exploration of boardroom decision-making. *Corporate Governance: An International Review*, 26, 219-234.
- Bianchi, M., Croce, A., Dell'Era, C., Di Benedetto, C. A., & Frattini, F. (2016). Organizing for inbound open innovation: how external consultants and a dedicated R&D unit influence product innovation performance. *Journal of Product Innovation Management*, 33, 492-510.
- Blau, P. M. (1960). A theory of social integration. *American Journal of Sociology*, 65, 545-556.
- Blumentritt, T. (2006). The relationship between boards and planning in family businesses. *Family Business Review*, 19, 65-72.
- Bodlaj, M., Kadic-Maglajlic, S., & Vida, I. (2020). Disentangling the impact of different innovation types, financial constraints and geographic diversification on SMEs' export growth. *Journal of Business Research*, 108, 466-475.
- Boivie, S., Bednar, M. K., & Barker, S. B. (2015). Social comparison and reciprocity in director compensation. *Journal of Management*, 41, 1578-1603.
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.
- Borch, O. J., & Huse, M. (1993). Informal strategic networks and the board of directors. *Entrepreneurship Theory and Practice*, 18, 23-36.
- Bouncken, R. B., Ratzmann, M., & Kraus, S. (2021). Anti-aging: How innovation is shaped by firm age and mutual knowledge creation in an alliance. *Journal of Business Research*, 137, 422-429.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Bucheli, M., & Salvaj, E. (2018). Political connections, the liability of foreignness, and legitimacy: A business historical analysis of multinationals' strategies in Chile. *Global Strategy Journal*, 8, 399-420.
- Burns T, Stalker GM. 1961. *The Management of Innovation*. Tavistock Publications: London, UK.
- Bustanza, O. F., Gomes, E., Vendrell-Herrero, F., & Baines, T. (2019). Product-service innovation and performance: the role of collaborative partnerships and R&D intensity. *R&D Management*, 49, 33-45.
- Camisón-Zornoza, C., Lapedra-Alcamí, R., Segarra-Ciprés, M., & Boronat-Navarro, M. (2004). A meta-analysis of innovation and organizational size. *Organization Studies*, 25, 331-361.
- Chen, I. J., Hsu, P. H., & Wang, Y. (2022). Staggered boards and product innovations: Evidence from Massachusetts State Bill HB 5640. *Research Policy*, 51, 104475.
- Chen, J., & Liu, L. (2020). Customer participation, and green product innovation in SMEs: The mediating role of opportunity recognition and exploitation. *Journal of Business Research*, 119, 151-162.
- Cheng, L., Xie, E., Fang, J., & Mei, N. (2022). Performance feedback and firms' relative strategic emphasis: The moderating effects of board independence and media coverage. *Journal of Business Research*, 139, 218-231.

- Chester Goduscheit, R., & Faullant, R. (2018). Paths toward radical service innovation in manufacturing companies—a service-dominant logic perspective. *Journal of Product Innovation Management*, 35, 701-719.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128-152.
- Cravens, K., & Wallace, W. (2001). A framework for determining the influence of the corporate board of directors in accounting studies. *Corporate Governance: An International Review*, 9, 2-24.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47, 1154-1191.
- Csaszar, F. A., & Ostler, J. (2020). A contingency theory of representational complexity in organizations. *Organization Science*, 31, 1198-1219.
- Curado, C., Muñoz-Pascual, L., & Galende, J. (2018). Antecedents to innovation performance in SMEs: A mixed methods approach. *Journal of Business Research*, 89, 206-215.
- Dah, M. A., & Frye, M. B. (2017). Is board compensation excessive?. *Journal of Corporate Finance*, 45, 566-585.
- Dalton, C. M., & Dalton, D. R. (2005). In defense of the individual: the CEO as board chairperson. *Journal of Business Strategy*, 26, 8-10.
- Dalton, C. M., & Dalton, D. R. (2006). Corporate governance best practices: the proof is in the process. *Journal of Business Strategy*, 27, 5-8.
- Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal*, 19, 269-290.
- Damanpour, F. (1992). Organizational size and innovation. *Organization Studies*, 13, 375-402.
- Damanpour, F., Sanchez-Henriquez, F., & Chiu, H. H. (2018). Internal and external sources and the adoption of innovations in organizations. *British Journal of Management*, 29, 712-730.
- Dasilas, A., & Papasyriopoulos, N. (2015). Corporate governance, credit ratings and the capital structure of Greek SME and large listed firms. *Small Business Economics*, 45, 215-244.
- Davis, P. E., & Bendickson, J. S. (2021). Strategic antecedents of innovation: Variance between small and large firms. *Journal of Small Business Management*, 59, 47-72.
- Deb, P., & Wiklund, J. (2017). The effects of CEO founder status and stock ownership on entrepreneurial orientation in small firms. *Journal of Small Business Management*, 55, 32-55.
- Del Brío, J. Á., & Junquera, B. (2003). A review of the literature on environmental innovation management in SMEs: implications for public policies. *Technovation*, 23, 939-948.
- Deschamps, J. P., & Nelson, B. (2014). *Innovation governance: How top management organizes and mobilizes for innovation*. John Wiley & Sons.
- Deutsch, Y. (2007). The influence of outside directors' stock-option compensation on firms' R&D. *Corporate Governance: An International Review*, 15, 816-827.
- Dewangan, V., & Godse, M. (2014). Towards a holistic enterprise innovation performance measurement system. *Technovation*, 34, 536-545.

- Díaz-Díaz, N. L., López-Iturriaga, F. J., & Santana-Martín, D. J. (2022). The role of political ties and political uncertainty in corporate innovation. *Long Range Planning*, 55, 102111.
- Ding, W. W., Murray, F., & Stuart, T. E. (2013). From bench to board: Gender differences in university scientists' participation in corporate scientific advisory boards. *Academy of Management Journal*, 56, 1443-1464.
- Doucouliafos, H., Haman, J., & Askary, S. (2007). Directors' remuneration and performance in Australian banking. *Corporate governance: An International Review*, 15, 1363-1383.
- Drymiotes, G., & Sivaramakrishnan, K. (2021). Strategic director appointments. *Journal of Accounting Research*, 59, 1303-1347.
- Edquist, C. (2019). Towards a holistic innovation policy: Can the Swedish National Innovation Council (NIC) be a role model?. *Research Policy*, 48, 869-879.
- Ejdemo, T., & Örtqvist, D. (2020). Related variety as a driver of regional innovation and entrepreneurship: A moderated and mediated model with non-linear effects. *Research Policy*, 49, 104073.
- Elms, N., & Pugliese, A. (2022). Director tenure and contribution to board task performance: A time and contingency perspective. *Long Range Planning*, 102217.
- Engel, P. J., Hack, A., Stanley, L. J., & Kellermanns, F. W. (2019). Voluntary disclosure of individual supervisory board compensation in public family firms. *Journal of Business Research*, 101, 362-374.
- Enkel, E., Groeminger, A., & Heil, S. (2018). Managing technological distance in internal and external collaborations: absorptive capacity routines and social integration for innovation. *The Journal of Technology Transfer*, 43, 1257-1290.
- Farrell, K. A., Friesen, G. C., & Hersch, P. L. (2008). How do firms adjust director compensation?. *Journal of Corporate Finance*, 14, 153-162.
- Fedaseyeu, V., Linck, J. S., & Wagner, H. F. (2018). Do qualifications matter? New evidence on board functions and director compensation. *Journal of Corporate Finance*, 48, 816-839.
- Federo, R., Ponomareva, Y., Aguilera, R. V., Saz-Carranza, A., & Losada, C. (2020). Bringing owners back on board: A review of the role of ownership type in board governance. *Corporate Governance: An International Review*, 28, 348-371.
- Fiegener, M. K., Brown, B. M., Dreux IV, D. R., & Dennis Jr, W. J. (2000). CEO stakes and board composition in small private firms. *Entrepreneurship Theory and Practice*, 24, 5-24.
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54, 393-420.
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- Foucart, R., & Li, Q. C. (2021). The role of technology standards in product innovation: Theory and evidence from UK manufacturing firms. *Research Policy*, 50, 104157.
- Freeman, R. E. 1984. *Strategic Management: A Stakeholder Approach*, Boston: Pitman Publishing Inc.
- Furnari, S., Crilly, D., Misangyi, V. F., Greckhamer, T., Fiss, P. C., & Aguilera, R. V. (2021). Capturing causal complexity: Heuristics for configurational theorizing. *Academy of Management Review*, 46, 778-799.

- Gai, S. L., Cheng, J. Y. J., & Wu, A. (2021). Board design and governance failures at peer firms. *Strategic Management Journal*, 42, 1909-1938.
- García-Ramos, R., & Díaz, B. D. (2021). Board of directors structure and firm financial performance: A qualitative comparative analysis. *Long Range Planning*, 54, 102017.
- Garg, S., & Eisenhardt, K. M. (2017). Unpacking the CEO–board relationship: How strategy making happens in entrepreneurial firms. *Academy of Management Journal*, 60, 1828-1858.
- Garg, S., John Li, Q., & Shaw, J. D. (2019). Entrepreneurial firms grow up: Board undervaluation, board evolution, and firm performance in newly public firms. *Strategic Management Journal*, 40, 1882-1907.
- Gentile-Lüdecke, S., Torres de Oliveira, R., & Paul, J. (2020). Does organizational structure facilitate inbound and outbound open innovation in SMEs?. *Small Business Economics*, 55, 1091-1112.
- Gentile-Lüdecke, S., Torres de Oliveira, R., & Paul, J. (2020). Does organizational structure facilitate inbound and outbound open innovation in SMEs?. *Small Business Economics*, 55, 1091-1112.
- Gimenez-Fernandez, E. M., Sandulli, F. D., & Bogers, M. (2020). Unpacking liabilities of newness and smallness in innovative start-ups: Investigating the differences in innovation performance between new and older small firms. *Research Policy*, 49, 104049.
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Griffin, D., Li, K., & Xu, T. (2021). Board gender diversity and corporate innovation: International evidence. *Journal of Financial and Quantitative Analysis*, 56, 123-154.
- Guldiken, O., Mallon, M. R., Fainshmidt, S., Judge, W. Q., & Clark, C. E. (2019). Beyond tokenism: How strategic leaders influence more meaningful gender diversity on boards of directors. *Strategic Management Journal*, 40, 2024-2046.
- Haneda, S., & Ito, K. (2018). Organizational and human resource management and innovation: which management practices are linked to product and/or process innovation?. *Research Policy*, 47, 194-208.
- Heracleous, L. (2001). What is the impact of corporate governance on organisational performance?. *Corporate governance: An International Review*, 9, 165-173.
- Herrmann, P., & Nadkarni, S. (2014). Managing strategic change: The duality of CEO personality. *Strategic Management Journal*, 35, 1318-1342.
- Hervás-Oliver, J. L., Parrilli, M. D., Rodríguez-Pose, A., & Sempere-Ripoll, F. (2021). The drivers of SME innovation in the regions of the EU. *Research Policy*, 50, 104316.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28(3), 383-396.
- Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal*, 39, 1084-1119.
- Hoppmann, J., Naegele, F., & Girod, B. (2019). Boards as a source of inertia: Examining the internal challenges and dynamics of boards of directors in times of environmental discontinuities. *Academy of Management Journal*, 62, 437-468.

- Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Grossman, W. (2002). Conflicting voices: The effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, 45, 697-716.
- Hsu, W. T., Chen, H. L., & Cheng, C. Y. (2013). Internationalization and firm performance of SMEs: The moderating effects of CEO attributes. *Journal of World Business*, 48, 1-12.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Ingle, C., Khlif, W., & Karoui, L. (2017). SME growth trajectories, transitions and board role portfolios: A critical review and integrative model. *International Small Business Journal*, 35, 729-750.
- Ingle, C., & Van Der Walt, N. (2005). Do board processes influence director and board performance? Statutory and performance implications. *Corporate Governance: An International Review*, 13, 632-653.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Judge Jr, W. Q., & Zeithaml, C. P. (1992). Institutional and strategic choice perspectives on board involvement in the strategic decision process. *Academy of Management Journal*, 35, 766-794.
- Kaczmarek, S., & B Nyuur, R. (2021). The implications of board nationality and gender diversity: evidence from a qualitative comparative analysis. *Journal of Management and Governance*, 1-27.
- Kang, Y., Zhao, C., & Battisti, M. (2022). Organizational learning in SMEs' internationalization: A moderated mediating effect of absorptive capacity. *Long Range Planning*, 102220.
- Kauffman, S. A. (1993). *The origins of order: Self-organization and selection in evolution*. Oxford University Press, USA.
- Kim, Y., & Cannella Jr, A. A. (2008). Toward a social capital theory of director selection. *Corporate Governance: An International Review*, 16(4), 282-293.
- Klärner, P., Probst, G., & Useem, M. (2020). Opening the black box: Unpacking board involvement in innovation. *Strategic Organization*, 18, 487-519.
- Kleinknecht, A. (1989). Firm size and innovation. *Small Business Economics*, 1, 215-222.
- Kosnik, R. D. (1990). Effects of board demography and directors' incentives on corporate greenmail decisions. *Academy of Management Journal*, 33, 129-150.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Leblanc, R., & Schwartz, M. S. (2007). The black box of board process: Gaining access to a difficult subject. *Corporate Governance: An International Review*, 15, 843-851.
- Lee, H., Kelley, D., Lee, J., & Lee, S. (2012). SME survival: The impact of internationalization, technology resources, and alliances. *Journal of Small Business Management*, 50, 1-19.

- Lee, S. H., & Phan, P. (2000). Competencies of Directors in Global Firms: requirements for recruitment and evaluation. *Corporate Governance: An International Review*, 8, 204-214.
- Lewellyn, K. B., & Muller-Kahle, M. I. (2020). The corporate board glass ceiling: The role of empowerment and culture in shaping board gender diversity. *Journal of Business Ethics*, 165, 329-346.
- Leyva-De la Hiz, D. I., & Bolívar-Ramos, M. T. (2022). The inverted U relationship between green innovative activities and firms' market-based performance: The impact of firm age. *Technovation*, 110, 102372.
- Li, H., Terjesen, S., & Umans, T. (2020). Corporate governance in entrepreneurial firms: a systematic review and research agenda. *Small Business Economics*, 54, 43-74.
- Lim, E. N., & McCann, B. T. (2014). Performance feedback and firm risk taking: The moderating effects of CEO and outside director stock options. *Organization Science*, 25, 262-282.
- Lioukas, C. S., & Reuer, J. J. (2020). Choosing between safeguards: Scope and governance decisions in R&D alliances. *Journal of Management*, 46, 359-384.
- López, A., Neves, P., & Cunha, M. (2019). A high-growth firm contingency test of the formalization-performance relationship. *Journal of Small Business Management*, 57, 374-396.
- Luciano, M. M., Nahrgang, J. D., & Shropshire, C. (2020). Strategic leadership systems: Viewing top management teams and boards of directors from a multiteam systems perspective. *Academy of Management Review*, 45, 675-701.
- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Ma, S., Kor, Y. Y., & Seidl, D. (2020). CEO advice seeking: An integrative framework and future research agenda. *Journal of Management*, 46, 771-805.
- Mabenge, B. K., Ngorora-Madzimure, G. P. K., & Makanyeza, C. (2020). Dimensions of innovation and their effects on the performance of small and medium enterprises: The moderating role of firm's age and size. *Journal of Small Business & Entrepreneurship*, 4, 1-25.
- Machold, S., Huse, M., Minichilli, A., & Nordqvist, M. (2011). Board leadership and strategy involvement in small firms: A team production approach. *Corporate Governance: An International Review*, 19, 368-383.
- Martin, W. L., McKelvie, A., & Lumpkin, G. T. (2016). Centralization and delegation practices in family versus non-family SMEs: A Rasch analysis. *Small Business Economics*, 47, 755-769.
- McCann, B. T., & Bahl, M. (2017). The influence of competition from informal firms on new product development. *Strategic Management Journal*, 38, 1518-1535.
- McKiernan, P., & Morris, C. (1994). Strategic planning and financial performance in UK SMEs: does formality matter?. *British Journal of Management*, 5, S31-S41.
- McGahan, A. M., Bogers, M. L., Chesbrough, H., & Holgersson, M. (2021). Tackling societal challenges with open innovation. *California Management Review*, 63, 49-61.
- McNulty, T., & Pettigrew, A. (1999). Strategists on the board. *Organization Studies*, 20, 47-74.
- Meyer, C. B., & Altenborg, E. (2007). The disintegrating effects of equality: A study of a failed international merger. *British Journal of Management*, 18, 257-271.



- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management Studies*, 46, 755-786.
- Minichilli, A., Gabriellson, J., & Huse, M. (2007). Board evaluations: Making a fit between the purpose and the system. *Corporate Governance: An International Review*, 15, 609-622.
- Minichilli, A., Zattoni, A., Nielsen, S., & Huse, M. (2012). Board task performance: An exploration of micro-and macro-level determinants of board effectiveness. *Journal of Organizational Behavior*, 33, 193-215.
- Minichilli, A., Zattoni, A., & Zona, F. (2009). Making boards effective: An empirical examination of board task performance. *British Journal of Management*, 20, 55-74.
- Miroshnychenko, I., Strobl, A., Matzler, K., & De Massis, A. (2021). Absorptive capacity, strategic flexibility, and business model innovation: Empirical evidence from Italian SMEs. *Journal of Business Research*, 130, 670-682.
- Misangyi, V. F., Greckhamer, T., Furnari, S., Fiss, P. C., Crilly, D., & Aguilera, R. (2017). Embracing causal complexity: The emergence of a neo-configurational perspective. *Journal of Management*, 43, 255-282.
- Morgan, T., & Anokhin, S. A. (2020). The joint impact of entrepreneurial orientation and market orientation in new product development: Studying firm and environmental contingencies. *Journal of Business Research*, 113, 129-138.
- Mutlu, C. C., Van Essen, M., Peng, M. W., Saleh, S. F., & Duran, P. (2018). Corporate governance in China: A meta-analysis. *Journal of Management Studies*, 55, 943-979.
- Nag, R., Neville, F., & Dimotakis, N. (2020). CEO scanning behaviors, self-efficacy, and SME innovation and performance: An examination within a declining industry. *Journal of Small Business Management*, 58, 164-199.
- Neville, F., Byron, K., Post, C., & Ward, A. (2019). Board independence and corporate misconduct: A cross-national meta-analysis. *Journal of Management*, 45, 2538-2569.
- Oehmichen, J., Schrapp, S., & Wolff, M. (2017). Who needs experts most? Board industry expertise and strategic change—a contingency perspective. *Strategic Management Journal*, 38, 645-656.
- Okhmatovskiy, I., & David, R. J. (2012). Setting your own standards: Internal corporate governance codes as a response to institutional pressure. *Organization Science*, 23, 155-176.
- OECD (2021). SME and Entrepreneurship Outlook 2021. Disponible à travers le lien suivant : <https://www.oecd.org/publications/oecd-sme-and-entrepreneurship-outlook-2021-97a5bbfe-en.htm>
- Oslo, Manual. 2018. Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation. Paris: OECD Publishing.
- Panayi, E., Bozos, K., & Veronesi, G. (2021). Corporate governance “bundles” and firm acquisitiveness. *Corporate Governance: An International Review*, 29, 402-426.
- Paniagua, J., Rivelles, R., & Sapena, J. (2018). Corporate governance and financial performance: The role of ownership and board structure. *Journal of Business Research*, 89, 229-234.
- Park, Y., Fiss, P. C., & El Sawy, O. A. (2020). Theorizing the multiplicity of digital phenomena: The ecology of configurations, causal recipes, and guidelines for applying QCA. *Management of Information Systems Quarterly*, 44, 1493-1520.

- Parrilli, M. D., Balavac, M., & Radicic, D. (2020). Business innovation modes and their impact on innovation outputs: Regional variations and the nature of innovation across EU regions. *Research Policy*, 49, 104047.
- Pearce II, J. A., & Patel, P. C. (2018). Board of director efficacy and firm performance variability. *Long Range Planning*, 51, 911-926.
- Pedersen, T., & Tallman, S. (2022). Global strategy collections: Emerging market multinational enterprises. *Global Strategy Journal*, 12, 199-208.
- Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, 13, 5-16.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Pfotenhauer, S. M., Juhl, J., & Aarden, E. (2019). Challenging the “deficit model” of innovation: Framing policy issues under the innovation imperative. *Research Policy*, 48, 895-904.
- Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, 93(6), 44-54.
- Preller, R., Patzelt, H., & Breugst, N. (2020). Entrepreneurial visions in founding teams: Conceptualization, emergence, and effects on opportunity development. *Journal of Business Venturing*, 35, 105914.
- Pugliese, A., Nicholson, G., & Bezemer, P. J. (2015). An observational analysis of the impact of board dynamics and directors' participation on perceived board effectiveness. *British Journal of Management*, 26, 1-25.
- Purkayastha, A., Karna, A., Sharma, S., & Bhadra, D. (2021). Board's human capital resource and internationalization of emerging market firms: Toward an integrated agency–resource dependence perspective. *Journal of Business Research*, 135, 391-407.
- Puthusserry, P., Khan, Z., Nair, S. R., & King, T. (2021). Mitigating psychic distance and enhancing internationalization of fintech SMEs from emerging markets: the role of board of directors. *British Journal of Management*, 32, 1097-1120.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the former CEO stays on board: The role of the predecessor's board retention for product innovation in family firms. *Journal of Product Innovation Management*, 37, 184-207.
- Raes, A. M., De Jong, S. B., & Bruch, H. (2022). Setting the tone at the top: How the interface processes of organizational climate and non-TMT Managers' leadership transmit TMT cohesion to employees. *Long Range Planning*, 55, 102157.
- Ragin, C. C. (2009). *Redesigning social inquiry: Fuzzy sets and beyond*. University of Chicago Press.
- Randøy, T., & Goel, S. (2003). Ownership structure, founder leadership, and performance in Norwegian SMEs: implications for financing entrepreneurial opportunities. *Journal of Business Venturing*, 18(5), 619-637.
- Rao, P., Kumar, S., Chavan, M., & Lim, W. M. (2021). A systematic literature review on SME financing: Trends and future directions. *Journal of Small Business Management*, 1-31.
- Rasmussen, J. (2015). Do board evaluations measure board effectiveness? The case of large listed companies in Norway. *International Studies of Management & Organization*, 45, 80-98.

- Rasmussen, C. C., Ladegård, G., & Korhonen-Sande, S. (2018). Growth intentions and board composition in high-growth firms. *Journal of Small Business Management*, 56, 601-617.
- Rejeb, H. B., Morel-Guimarães, L., & Boly, V. (2008). Measuring innovation best practices: Improvement of an innovation index integrating threshold and synergy effects. *Technovation*, 28, 838-854.
- Rodrigues, R., Samagaio, A., & Felício, T. (2020). Corporate governance and R&D investment by European listed companies. *Journal of Business Research*, 115, 289-295.
- Rosenstein, J., Bruno, A. V., Bygrave, W. D., & Taylor, N. T. (1993). The CEO, venture capitalists, and the board. *Journal of Business Venturing*, 8, 99-113.
- Schiehl, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Shaikh, I. A., Drira, M., & Hassine, S. B. (2019). What motivates directors to pursue long-term strategic risks? Economic incentives vs. fiduciary duty. *Journal of Business Research*, 101, 218-228.
- Shaikh, I., & Randhawa, K. (2022). Managing the risks and motivations of technology managers in open innovation: Bringing stakeholder-centric corporate governance into focus. *Technovation*, 114, 102437.
- Shearmur, R., & Doloreux, D. (2016). How open innovation processes vary between urban and remote environments: slow innovators, market-sourced information and frequency of interaction. *Entrepreneurship & Regional Development*, 28, 337-357.
- Shefer, D., & Frenkel, A. (2005). R&D, firm size and innovation: an empirical analysis. *Technovation*, 25, 25-32.
- Shehata, N., Salhin, A., & El-Helaly, M. (2017). Board diversity and firm performance: evidence from the UK SMEs. *Applied Economics*, 49(48), 4817-4832.
- Sheikh, M. F., Shah, S. Z. A., & Akbar, S. (2018). Firm performance, corporate governance and executive compensation in Pakistan. *Applied economics*, 50, 2012-2027.
- Schwens, C., Eiche, J., & Kabst, R. (2011). The moderating impact of informal institutional distance and formal institutional risk on SME entry mode choice. *Journal of Management Studies*, 48, 330-351.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly*, 23409444211039856.
- Singh, J. V. (1986). Organizational Legitimacy and the Liability of Newness. *Administrative Science Quarterly*, 31, 171-93.
- Sjödin, D., Parida, V., Jovanovic, M., & Visnjic, I. (2020). Value creation and value capture alignment in business model innovation: A process view on outcome-based business models. *Journal of Product Innovation Management*, 37, 158-183.
- Speldekamp, D., Knobben, J., & Saka-Helmhout, A. (2020). Clusters and firm-level innovation: A configurational analysis of agglomeration, network and institutional advantages in European aerospace. *Research Policy*, 49, 103921.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate board interlocks and new product introductions. *Journal of Marketing*, 82, 132-148.

- Standaert, T., Knockaert, M., & Manigart, S. (2022). Venture capital winners: A configurational approach to high Venture capital-backed firm growth. *British Journal of Management*, 33, 211-230.
- Steckler, E., & Clark, C. (2019). Authenticity and corporate governance. *Journal of Business Ethics*, 155, 951-963.
- Storey, C., Cankurtaran, P., Papastathopoulou, P., & Hultink, E. J. (2016). Success factors for service innovation: A meta-analysis. *Journal of Product Innovation Management*, 33, 527-548.
- Strese, S., Keller, M., Flatten, T. C., & Brettel, M. (2018). CEOs' passion for inventing and radical innovations in SMEs: The moderating effect of shared vision. *Journal of Small Business Management*, 56, 435-452.
- Tang, J., Tang, Z., & Cowden, B. J. (2017). Exploring the relationship between entrepreneurial orientation, CEO dual values, and SME performance in state-owned vs. nonstate-owned enterprises in China. *Entrepreneurship Theory and Practice*, 41, 883-908.
- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58, 13-35.
- Terziovski, M. (2010). Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: a resource-based view. *Strategic Management Journal*, 31, 892-902.
- Torres de Oliveira, R., Sahasranamam, S., Figueira, S., & Paul, J. (2020). Upgrading without formal integration in M&A: The role of social integration. *Global Strategy Journal*, 10, 619-652.
- Uhlaner, L., Massis, A. D., Jorissen, A., & Du, Y. (2021). Are outside directors on the small and medium-sized enterprise board always beneficial? Disclosure of firm-specific information in board-management relations as the missing mechanism. *Human Relations*, 74, 1781-1819.
- Valentim, L., Lisboa, J. V., & Franco, M. (2016). Knowledge management practices and absorptive capacity in small and medium-sized enterprises: is there really a linkage?. *R&D Management*, 46, 711-725.
- Vandebeek, A., Voordeckers, W., Huybrechts, J., & Lambrechts, F. (2021). Corporate performance and CEO dismissal: The role of social category faultlines. *Corporate Governance: An International Review*, 29, 436-460.
- Vandebeek, A., Voordeckers, W., Lambrechts, F., & Huybrechts, J. (2016). Board role performance and faultlines in family firms: The moderating role of formal board evaluation. *Journal of Family Business Strategy*, 7, 249-259.
- Van den Heuvel, J., Van Gils, A., & Voordeckers, W. (2006). Board roles in small and medium-sized family businesses: Performance and importance. *Corporate Governance: An International Review*, 14, 467-485.
- Vendrell-Herrero, F., Gomes, E., Bustinza, O. F., & Mellahi, K. (2018). Uncovering the role of cross-border strategic alliances and expertise decision centralization in enhancing product-service innovation in MMNEs. *International Business Review*, 27, 814-825.

- Voordeckers, W., Van Gils, A., & Van den Heuvel, J. (2007). Board composition in small and medium-sized family firms. *Journal of Small Business Management*, 45, 137-156.
- Wakasugi, R., & Koyata, F. (1997). R&D, firm size and innovation outputs: are Japanese firms efficient in product development?. *Journal of Product Innovation Management*, 14, 383-392.
- West, J., & Bogers, M. (2014). Leveraging external sources of innovation: a review of research on open innovation. *Journal of Product Innovation Management*, 31, 814-831.
- Westphal, J. D., & Zajac, E. J. (1995). Who shall govern? CEO/board power, demographic similarity, and new director selection. *Administrative Science Quarterly*, 40, 60-83.
- Williamson, O. E. (1991). Strategizing, economizing, and economic organization. *Strategic Management Journal*, 12, 75-94.
- Wincent, J., Anokhin, S., & Örtqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME networks. *Journal of Business Research*, 63, 265-275.
- Witt, M. A., Fainshmidt, S., & Aguilera, R. V. (2022). Our board, our rules: Nonconformity to global corporate governance norms. *Administrative Science Quarterly*, 67, 131-166.
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Yi, J., Murphree, M., Meng, S., & Li, S. (2021). The more the merrier? Chinese government R&D subsidies, dependence, and firm innovation performance. *Journal of Product Innovation Management*, 38, 289-310.
- Yildirim-Öktem, Ö., & Üsdiken, B. (2010). Contingencies versus external pressure: professionalization in boards of firms affiliated to family business groups in late-industrializing countries. *British Journal of Management*, 21, 115-130.
- Zahra, S. A., & Filatotchev, I. (2004). Governance of the entrepreneurial threshold firm: A knowledge-based perspective. *Journal of Management Studies*, 41, 885-897.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., Neubaum, D. O., & Naldi, L. (2007). The effects of ownership and governance on SMEs' international knowledge-based resources. *Small Business Economics*, 29, 309-327.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zhu, H., Wang, P., & Bart, C. (2016). Board processes, board strategic involvement, and organizational performance in for-profit and non-profit organizations. *Journal of Business Ethics*, 136, 311-328.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24, 299-315.

## Section « conclusion générale »

- Åberg, C., Bankewitz, M., & Knockaert, M. (2019). Service tasks of board of directors: A literature review and research agenda in an era of new governance practices. *European Management Journal*, 37, 648-663.
- Aaboen, L., Lindelof, P., Christopher von, K., & Lofsten, H. (2006). Corporate governance and performance of small high-tech firms in Sweden. *Technovation*, 26, 955-968.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., & Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, 33, 455-469.
- Baker, H. K., Pandey, N., Kumar, S., & Haldar, A. (2020). A bibliometric analysis of board diversity: Current status, development, and future research directions. *Journal of Business Research*, 108, 232-246.
- Bendig, D., Foege, J. N., Endriß, S., & Brettel, M. (2020). The effect of family involvement on innovation outcomes: the moderating role of board social capital. *Journal of Product Innovation Management*, 37, 249-272.
- Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, 127, 588-612.
- Bezemer, P. J., Pugliese, A., Nicholson, G., & Zattoni, A. (2022). Toward a synthesis of the board-strategy relationship: A literature review and future research agenda. *Corporate Governance: An International Review* (in press).
- Boivie, S., Withers, M. C., Graffin, S. D., & Corley, K. G. (2021). Corporate directors' implicit theories of the roles and duties of boards. *Strategic Management Journal*, 42, 1662-1695.
- Bonini, S., & Lagasio, V. (2022). Board meetings dynamics and information diffusion. *Corporate Governance: An International Review*, 30, 96-119.
- Bravo, F., & Reguera-Alvarado, N. (2017). The effect of board of directors on R&D intensity: board tenure and multiple directorships. *R&D Management*, 47, 701-714.
- Brunninge, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics*, 29, 295-308.
- Burns, T., & Stalker, G. M. 1961. *The management of innovation*. London: Tavistock.
- Chang, C. H., & Wu, Q. (2021). Board networks and corporate innovation. *Management Science*, 67, 3618-3654.
- Chen, C. J., Lin, B. W., Lin, Y. H., & Hsiao, Y. C. (2016). Ownership structure, independent board members and innovation performance: A contingency perspective. *Journal of Business Research*, 69, 3371-3379.
- Cuomo, F., Mallin, C., & Zattoni, A. (2016). Corporate governance codes: A review and research agenda. *Corporate Governance: An International Review*, 24, 222-241.
- De Massis, A., Frattini, F., Kotlar, J., Petruzzelli, A. M., & Wright, M. (2016). Innovation through tradition: Lessons from innovative family businesses and directions for future research. *Academy of Management Perspectives*, 30, 93-116.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14, 57-74.
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate Governance: An International Review*, 11, 102-111.

- Federo, R., Ponomareva, Y., Aguilera, R. V., Saz-Carranza, A., & Losada, C. (2020). Bringing owners back on board: A review of the role of ownership type in board governance. *Corporate Governance: An International Review*, 28, 348-371.
- Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review*, 24, 489-505.
- García-Ramos, R., & Díaz, B. D. (2021). Board of directors structure and firm financial performance: A qualitative comparative analysis. *Long Range Planning*, 54, 102017.
- Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53, 355-381.
- Gonzales-Bustos, J. P., & Hernández-Lara, A. B. (2016). Corporate governance and innovation: A systematic literature review. *Corporate Ownership and Control*, 13, 33-45.
- Gurtner, S., & Reinhardt, R. (2016). Ambidextrous idea generation—Antecedents and outcomes. *Journal of Product Innovation Management*, 33, 34-54.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37, 235-256.
- Honoré, F., Munari, F., & de La Potterie, B. V. P. (2015). Corporate governance practices and companies' R&D intensity: Evidence from European countries. *Research Policy*, 44, 533-543.
- Huse, M. (2000). Boards of directors in SMEs: A review and research agenda. *Entrepreneurship & Regional Development*, 12, 271-290.
- Johnson, J. L., Daily, C. M., & Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.
- Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management*, 39, 232-262.
- Kauffman, S. A. (1993). *The origins of order: Self-organization and selection in evolution*. Oxford University Press, USA.
- Khanna, P., Jones, C. D., & Boivie, S. (2014). Director human capital, information processing demands, and board effectiveness. *Journal of Management*, 40, 557-585.
- Kirsch, A. (2018). The gender composition of corporate boards: A review and research agenda. *The Leadership Quarterly*, 29, 346-364.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27, 1081-1099.
- Kumar, P., & Zattoni, A. (2019). Farewell editorial: Exiting editors' perspective on current and future challenges in corporate governance research. *Corporate Governance: An International Review*, 27, 2-11.
- Kurzahls, C., Graf-Vlachy, L., & König, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate Governance: An International Review*, 28, 437-464.
- Lim, E. N., & McCann, B. T. (2014). Performance feedback and firm risk taking: The moderating effects of CEO and outside director stock options. *Organization Science*, 25, 262-282.

- Lungeanu, R., & Zajac, E. J. (2019). Thinking broad and deep: Why some directors exert an outsized influence on strategic change. *Organization Science*, 30, 489-508.
- Ma, S., Seidl, D., & McNulty, T. (2021). Challenges and practices of interviewing business elites. *Strategic Organization*, 19, 81-96.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The impact of family ownership, management, and governance on innovation. *Journal of Product Innovation Management*, 32, 319-333.
- McCann, B. T., & Bahl, M. (2017). The influence of competition from informal firms on new product development. *Strategic Management Journal*, 38, 1518-1535.
- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management Studies*, 46, 755-786.
- Misangyi, V. F., Greckhamer, T., Furnari, S., Fiss, P. C., Crilly, D., & Aguilera, R. (2017). Embracing causal complexity: The emergence of a neo-configurational perspective. *Journal of Management*, 43, 255-282.
- Nicholson, G. J., & Kiel, G. C. (2004). A framework for diagnosing board effectiveness. *Corporate Governance: An International Review*, 12, 442-460.
- Nguyen, T. H. H., Ntim, C. G., & Malagila, J. K. (2020). Women on corporate boards and corporate financial and non-financial performance: A systematic literature review and future research agenda. *International Review of Financial Analysis*, 71, 1-24.
- Panayi, E., Bozos, K., & Veronesi, G. (2021). Corporate governance “bundles” and firm acquisitiveness. *Corporate Governance: An International Review*, 29, 402-426.
- Payne, G. T., Benson, G. S., & Finegold, D. L. (2009). Corporate board attributes, team effectiveness and financial performance. *Journal of Management Studies*, 46, 704-731.
- Pearce II, J. A., & Patel, P. C. (2018). Board of director efficacy and firm performance variability. *Long Range Planning*, 51, 911-926.
- Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29, 411-438.
- Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, 13, 5-16.
- Piening, E. P., & Salge, T. O. (2015). Understanding the antecedents, contingencies, and performance implications of process innovation: A dynamic capabilities perspective. *Journal of Product Innovation Management*, 32, 80-97.
- Pugliese, A., Nicholson, G., & Bezemer, P. J. (2015). An observational analysis of the impact of board dynamics and directors' participation on perceived board effectiveness. *British Journal of Management*, 26, 1-25.
- Querbach, S., Bird, M., Kraft, P. S., & Kammerlander, N. (2020). When the former CEO stays on board: The role of the predecessor's board retention for product innovation in family firms. *Journal of Product Innovation Management*, 37, 184-207.
- Robeson, D., & O'Connor, G. C. (2013). Boards of Directors, Innovation, and Performance: An Exploration at Multiple Levels. *Journal of Product Innovation Management*, 30, 608-625.
- Sena, V., Duygun, M., Lubrano, G., Marra, M., & Shaban, M. (2018). Board independence, corruption and innovation. Some evidence on UK subsidiaries. *Journal of Corporate Finance*, 50, 22-43.
- Schaedler, L., Graf-Vlachy, L., & König, A. (2021). Strategic leadership in organizational crises: A review and research agenda. *Long Range Planning* (in press), 102156.



- Schiehll, E., Lewellyn, K. B., & Muller-Kahle, M. I. (2018). Pilot, pivot and advisory boards: The role of governance configurations in innovation commitment. *Organization Studies*, 39, 1449-1472.
- Sierra-Morán, J., Cabeza-García, L., González-Álvarez, N., & Botella, J. (2021). The board of directors and firm innovation: A meta-analytical review. *BRQ Business Research Quarterly* (in press), 23409444211039856.
- Solarino, A. M., & Aguinis, H. (2021). Challenges and best-practice recommendations for designing and conducting interviews with elite informants. *Journal of Management Studies*, 58, 649-672.
- Srinivasan, R., Wuyts, S., & Mallapragada, G. (2018). Corporate board interlocks and new product introductions. *Journal of Marketing*, 82(1), 132-148.
- Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review*, 44, 746-765.
- Thorgren, S., Wincent, J., & Anokhin, S. (2010). The importance of compensating strategic network board members for network performance: A contingency approach. *British Journal of Management*, 21, 131-151.
- Uhlaner, L., Massis, A. D., Jorissen, A., & Du, Y. (2021). Are outside directors on the small and medium-sized enterprise board always beneficial? Disclosure of firm-specific information in board-management relations as the missing mechanism. *Human Relations*, 74, 1781-1819.
- Veltrop, D. B., Bezemer, P. J., Nicholson, G., & Pugliese, A. (2021). Too unsafe to monitor? How board-CEO cognitive conflict and chair leadership shape outside director monitoring. *Academy of Management Journal*, 64, 207-234.
- Wu, H. L. (2008). When does internal governance make firms innovative?. *Journal of Business Research*, 61, 141-153.
- Wu, J., & Wu, Z. (2014). Integrated risk management and product innovation in China: The moderating role of board of directors. *Technovation*, 34, 466-476.
- Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26, 947-976.
- Zahra, S. A., & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15, 291-334.
- Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, 41, 1214-1243.
- Zhu, H., Wang, P., & Bart, C. (2016). Board processes, board strategic involvement, and organizational performance in for-profit and non-profit organizations. *Journal of Business Ethics*, 136, 311-328.
- Zona, F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, 45, 560-575.
- Zona, F., Zattoni, A., & Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, 24(3), 299-315.