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TROIS ESSAIS SUR LA RELATION ENTRE LA PERFORMANCE SOCIALE ET LE RISQUE DES ENTREPRISES

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À mon père

À ma mère

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LISTE DES ABRÉVIATIONS, SIGLES ET ACRONYMES

CRSP	Center for Research in Securities Prices
CUSIP	Committee on Uniform Securities Identification Procedures
ESG	Critères Environnementaux, Sociaux et de Gouvernance
FHS	Filtered Historical Simulation
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
HS	Historical Simulation
IBES	Institutional Brokers' Estimate System
ISR	Investissement Socialement Responsable
KLD	KLD Research & Analytics Inc
PF	Performance Financière
PRI	Principles for Responsible Investment
PS	Performance Sociale
RM	Risk Metrics
RSE	Responsabilité Sociale des Entreprises
SP	Social Performance
VaR	Value at Risk

RÉSUMÉ

Cette thèse consiste en trois articles qui examinent divers aspects de la relation entre le risque et la performance sociale (PS).

Le premier article examine la relation entre PS et le risque des entreprises non financières durant la période 1991-2007. Nos résultats montrent que la mesure agrégée de PS, qui combine les forces et les faiblesses sociales, est négativement reliée à la volatilité des rendements et au risque idiosyncratique. Après avoir divisé la mesure agrégée de PS afin de distinguer les forces et les faiblesses sociales, nous constatons que les forces et les faiblesses sociales sont positivement reliées à la volatilité et au risque idiosyncratique. Il y a une relation asymétrique dans laquelle l'impact des faiblesses sociales sur le risque est plus élevé que l'impact des forces sociales. Nous avons examiné également la question de causalité inverse et avons trouvé que les risques total et idiosyncratique sont positivement associés aux forces et aux faiblesses sociales. Cela implique que le risque affecte à son tour PS. Enfin, nous avons examiné la direction de causalité entre le risque et PS. Les résultats montrent qu'il y a une relation bidirectionnelle entre les forces sociales et le risque, et une relation unidirectionnelle du risque vers les faiblesses sociales.

Le deuxième article examine la relation entre les dimensions individuelles de PS et les risques total et idiosyncratique pour les entreprises non financières durant la période 1991-2007. Nos résultats montrent que seulement certaines dimensions de PS affectent le risque. Pour les entreprises du S&P500, les faiblesses sociales des dimensions employés, gouvernance et diversité augmentent le risque, tandis que les forces des dimensions communauté (diversité) réduisent (augmentent) le risque. Pour les entreprises non incluses au S&P500, les faiblesses (forces) sociales de la dimension employée (diversité) augmentent le risque, tandis que les forces en matière d'environnement réduisent le risque. Enfin, nous avons examiné les liens de causalités et avons trouvé que la causalité a tendance à varier selon les différentes dimensions de PS.

Le troisième article examine l'impact de PS sur le risque (total, systématique, idiosyncratique, Valeur à Risque (VaR)) pour un échantillon d'entreprises financières durant la période 1991-2007. Nous avons trouvé que la mesure agrégée de PS (faiblesses sociales) est négativement (positivement) reliée à toutes les mesures de risque. L'impact négatif du PS sur le risque est donc dû principalement à des faiblesses sociales, ce qui suggère une relation asymétrique entre PS et le risque. Nous avons trouvé aussi que les faiblesses sociales des dimensions employées, produit et gouvernance affectent positivement toutes les mesures de risque, tandis que les forces sociales en matière de produit affectent positivement la VaR. Enfin, une analyse supplémentaire montre que PS affecte le risque des banques et des firmes d'investissement (courtage), mais non pas les entreprises d'assurance.

Mots clés : Volatilité, risque idiosyncratique, risque systématique, valeur à risque (VaR), performance sociale, forces sociales, faiblesses sociales.

ABSTRACT

This thesis is comprised of three papers addressing several aspects of the relationship between the firm's risk and social performance (SP).

The first paper examines the relationship between the firm's risk and SP using 16,599 U.S. firm-year observations covering the period 1991-2007. We find that the aggregate measure SP, which combines strengths and concerns, is negatively related to stock return volatility and idiosyncratic risk. After splitting the aggregate measure SP into its strengths and concerns components, we find that both concerns and strengths scores are positively related to the firm's volatility and idiosyncratic risk. There is also evidence of an asymmetric relation where the impact of concerns on volatility and idiosyncratic risk is stronger than the impact of strengths. We also examine the reverse causality issue and find that total and idiosyncratic risks are positively associated with both concerns and strengths scores. This implies that the relation between SP and a firm's risk also runs from risk to SP. Finally, we examine the direction of causation between firm risk and SP. The results show that there is a bi-directional causality between firm's risk and strengths, and a unidirectional causality from firm's risk to concerns.

The second paper examines the impact of the individual dimensions of SP on firm's risk (total and idiosyncratic) using 16,599 U.S. firm-year observations over the period 1991-2007. We find that not all SP dimensions are relevant for firm risk. For the whole sample, we find that Employee, Diversity, Governance and Human Rights concerns positively affect firm's risk, whereas Diversity and Governance strengths positively affect firm's risk. When splitting the sample based on S&P500 membership, we find that Employee, Diversity and Governance concerns positively affect firm's risk, whereas Community (Diversity) strengths negatively (positively) affect firm's risk for S&P500 firms. For non S&P500 firms, Employee concerns and Diversity strengths positively affect firm's risk, whereas Environment strengths negatively affect firm's risk. We also find that the direction of causation tend to vary along the different SP dimensions.

The third paper examines the impact of SP on the financial firm's risk (total, idiosyncratic, systematic and tail (VaR)) for a sample of 4132 financial firm-year observations covering the period 1991-2007. We find that the aggregate measure of SP (concerns) is significantly and negatively (positively) related to a financial firm's risk. The negative impact of SP on a financial firm's risk is mainly due to concerns, which suggests an asymmetric relation between SP and a financial firm's risk. We also find that Employee, Product and Corporate Governance concerns positively affect all risk measures, whereas Product strengths positively affect the VaR. Additional analysis shows that SP affects the risk of banks and trading firms, but not insurance firms.

Keywords: Volatility, idiosyncratic risk, systematic risk, value at risk (VaR), social performance, strengths, concerns.

INTRODUCTION GÉNÉRALE

La relation entre la performance sociale (PS) et la performance financière (PF) a été largement étudiée dans la littérature académique, mais les résultats sont mitigés (Ullmann, 1985; Pava et Krausz, 1996; Griffin and Mahon, 1997; Frooman, 1997; Roman *et al.,* 1999; Orlitzky and Benjamin, 2001; Margolis et Walsh, 2003; Orlitzky *et al.,* 2003; Mattingly et Berman, 2006; Baron *et al.,* 2011).[1] Griffin et Mahon (1997) et Preston et O'Bannon (1997) soutiennent que la relation, si elle existe, entre PS et PF n'a pas été complètement prouvée. Aujourd'hui encore, aucun consensus clair n'existe (Baron *et al.,* 2011). La diversité des mesures de la performance financière, et la difficulté et la complexité d'évaluation de la performance sociale sont parmi les principales raisons évoquées pour expliquer cette divergence des résultats (Waddock et Graves, 1997; Carroll, 2000; Margolis et Walsh, 2003; Orlitzky *et al.,* 2003; Mattingly et Berman, 2006). Un récent courant de recherche explore une nouvelle piste en soutenant que PS est plutôt reliée au risque qui affecte à son tour la profitabilité ou la rentabilité (Starks, 2009). Cette thèse s'inscrit dans ce nouveau courant de recherche et étudie la relation entre la performance sociale (PS) et le risque des entreprises. En particulier, les deux premiers articles de la présente thèse analysent divers aspects de la relation entre la performance sociale (PS) et le risque pour les entreprises non financières. Le troisième article étudie la relation entre la performance sociale (PS) et le risque pour les entreprises financières.

L'objectif principal de cette thèse est de contribuer à une meilleure compréhension de la relation entre la performance sociale (PS) et le risque des entreprises. Sa pertinence réside dans le fait qu'elle vise à fournir un test direct du potentiel de réduction du risque associé à PS.

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[1] Il existe essentiellement trois courants d'études empiriques sur la relation entre PS et PF. Le premier courant d'études utilise les analyses de corrélations et de régressions, le second courant d'études utilise la méthodologie des études d'événements, et le troisième courant d'études analyse la performance des portefeuilles (fonds communs de placement ou portefeuilles artificiellement construits) socialement et/ou environnementalement responsables.

Le premier article examine la relation entre la performance sociale, au niveau global, et le risque des entreprises non financières. Nous examinons les relations entre d'une part, des mesures agrégées de PS, des forces (*strengths*) et des faiblesses (*concerns*) sociales, et d'autre part, le risque total et ses composantes systématique et idiosyncratique. Plusieurs arguments théoriques proposés dans la littérature suggèrent qu'une bonne (mauvaise) PS réduit (augmente) le risque de l'entreprise. Par exemple, la théorie des parties prenantes souligne l'importance de la gestion des risques sociaux et environnementaux qui pourrait réduire le risque global de l'entreprise (McGuire *et al.,* 1988; Waddock et Graves, 1997). Les investisseurs pourront percevoir l'entreprise ayant une PS supérieure comme étant moins susceptible de faire l'objet de crises sociales ou environnementales. De même, l'argument de reconnaissance des investisseurs suggère que les entreprises ayant une bonne PS, peuvent élargir leur base d'investisseurs et faciliter ainsi leur accès aux capitaux en attirant en plus des investisseurs individuels et institutionnels conventionnels ceux socialement responsables (Heinkel *et al.,* 2001; Mackey *et al.,* 2007). Ces investisseurs socialement responsables peuvent augmenter la demande pour les opportunités d'investissement socialement responsable, et par conséquent réduire leur risque.

Le premier article vise à vérifier à partir d'un large échantillon d'entreprises non financières et sur la période 1991-2007, la relation entre les risques (total, idiosyncratique et systématique) de l'entreprise et sa performance sociale. Nous y faisons l'hypothèse que chaque dimension utilisée pour évaluer PS (par exemple, la communauté, les relations avec les employés, l'environnement) a la même importance que les autres dimensions dans le calcul de nos mesures agrégées de PS, des forces (*strengths*) et des faiblesses (*concerns*) sociales.

Toutefois, cette agrégation équipondérée de toutes ces dimensions de PS présente deux limites. Premièrement, la combinaison de toutes les dimensions de PS en une seule mesure globale peut masquer les effets de chaque dimension qui n'a pas nécessairement le même degré d'importance et de pertinence pour une entreprise ou un investisseur donné (Griffin et Mahon, 1997; Johnson et Greening, 1999; Hillman et Keim, 2001; Rehbein *et al.,* 2004). Deuxièmement, les forces et les faiblesses de chaque dimension de PS sont distinctes empiriquement et conceptuellement (Mattingly et Berman, 2006), et supposer un effet

compensatoire des forces et des faiblesses peut masquer une relation entre la PS et le risque. Pour prendre en compte ces limites, le deuxième article examine l'impact des dimensions individuelles de PS sur le risque des entreprises non financières. Dans un premier temps, nous utilisons une mesure agrégée de chaque dimension de PS qui combine les forces et les faiblesses, ensuite, dans un deuxième temps nous utilisons des mesures distinctes pour les forces et pour les faiblesses de chaque dimension de PS.

La quasi-totalité des études précédentes ne distinguent pas les entreprises financières des autres. Elles supposent donc implicitement que les effets et la dynamique de PS sont similaires indépendamment de la nature de l'entreprise et de son secteur d'activité. Toutefois, les entreprises financières sont fondamentalement différentes des autres entreprises (Diamond et Rajan, 2000; Jorion, 2003). Par exemple, les actifs et les activités des banques diffèrent de ceux des entreprises industrielles (Diamond et Rajan, 2000). Également, les effets indirects de faillite sont plus faibles pour les entreprises industrielles relativement aux entreprises financières (Jorion, 2003). Ces dernières sont sujettes à différentes réglementations tant au niveau national qu'international (Jorion, 2003). Par exemple, le comité de Bâle pour la supervision bancaire a établi des normes de capital et de liquidité, connues sous le nom «les accords de Bâle I, II et III»[2], que les banques se doivent de respecter pour opérer. Étant donné le caractère distinct des entreprises financières, le troisième article de la présente thèse examine l'impact des mesures agrégées de PS, des forces et des faiblesses sociales sur diverses mesures de risque des entreprises financières. Nous examinons également l'impact des dimensions de PS prises individuellement sur ces mesures de risque.

Ce chapitre introductif est organisé de la manière suivante. Dans une première partie, nous présentons la définition et les mesures de PS retenues dans cette thèse. La deuxième partie discutera les études empiriques qui ont examiné la relation entre PS et certaines mesures de risque. La troisième et dernière partie présentera les arguments théoriques qui pourraient justifier la relation entre PS et le risque. Tout au long de ce chapitre, nous tenterons de situer notre travail de recherche et de montrer sa pertinence et ses contributions par rapport à la littérature existante.

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[2] Les pays du G20 ont approuvé le Bâle III en novembre 2010. Pour avoir plus de détails sur le Bâle III, le lecteur peut consulter le site suivant: http://www.bis.org.

1. La performance sociale (PS) : définition, importance et mesure

1.1. Définition et importance de la performance sociale

Traditionnellement, l'objectif de l'entreprise est de maximiser les profits intertemporels ou la richesse des actionnaires (propriétaires de l'entreprise). Cette vision de l'entreprise met l'emphase sur la relation entre les gestionnaires et les actionnaires et fait de ces derniers l'unique partie prenante envers qui l'entreprise est redevable. Le concept de la responsabilité sociale des entreprises (RSE) a altéré cette vision classique en élargissant le cercle de parties prenantes à toute partie qui affecte ou est affectée par les activités de l'entreprise dont les clients, les employés, les fournisseurs, la communauté, l'environnement etc., (Freeman, 1984). La RSE soutient que les entreprises ont une obligation envers des parties prenantes directes ou indirectes autres que les actionnaires et ce, au-delà de ce qui est prescrit par la loi et les conventions syndicales (Carroll, 1999).[3] Ainsi, la RSE peut se traduire par des actions telles que l'amélioration du bien-être des employés, l'engagement à la protection des droits de l'homme et l'environnement, et le soutien des communautés (par exemple, actions philanthropiques). Pour mesurer la performance des entreprises par rapport à ces dimensions, les chercheurs ont développé le concept de performance sociale (PS) (Carroll, 1979; 1999; Wood, 1991; Waddock et Graves, 1997).

Durant les deux dernières décennies, les concepts de RSE et de PS ont connu une importance croissante au sein de la communauté financière. D'abord, il y a eu l'émergence et la croissance des agences de notation sociales des entreprises (par exemple, KLD aux États-Unis[4], Sustainalytics qui opère au niveau global[5], EIRIS au Royaume-Uni[6] et Vigeo en

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[3] Carroll (1999) définit la RSE en terme managériale comme suit: « une entreprise responsable socialement doit s'efforcer à faire des profits, respecter la loi, être éthique et être un bon citoyen corporatif » (p.289). Pour répondre adéquatement aux attentes des parties prenantes pertinentes, ces responsabilités ne doivent pas être assumées de façon séquentielle, mais plutôt simultanément, et ce, en tout temps (Carroll, 1999).

[4] MSCI ESG STATS (connu auparavant sous le nom de KLD en référence à la firme KLD Research & Analytics Inc qui a été acquise par MSCI). Tout au long de la thèse, on utilise l'abréviation KLD pour désigner cette base de données sociales.

[5] Sustainalytics a été formé à partir de la fusion entre la société néerlandaise "Sustainalytics" et la firme canadienne "Jantzi Research Inc" en Août 2009 (http://www.sustainalytics.com/).

[6] http://www.eiris.org/

France[7]). Deuxièmement, plusieurs fonds communs de placement (par exemple, Calvert Enhanced Equity Portfolio, Balanced Social Values Plus Fund et Walden Equity Fund) et d'indices (par exemple, Dow Jones Sustainability Indexes, Domini 400 Social Index, Calvert Social Index, FTSE4Good Index, et Jantzi Social Index) qui sélectionnent les entreprises sur la base des critères RSE ont été développés. Troisièmement, il y a un intérêt accru des investisseurs individuels et institutionnels pour les questions de RSE. En effet, en 2010, les actifs dans l'investissement socialement responsable (ISR) représentent 12.2% de tous les actifs sous gestion aux États-Unis et 19.1% au Canada (SIO, 2010; SIF, 2010). De plus, les principaux investisseurs institutionnels de différents pays ont signé les Principes pour l'Investissement Responsable (PRI), lancés en avril 2006 par les Nations-Unies.[8] Les principes PRI fournissent aux investisseurs institutionnels un cadre volontaire pour intégrer des critères sociaux, environnementaux et de gouvernance (ESG) dans leurs processus de sélection d'entreprises et d'activisme actionnarial afin de mieux aligner leurs objectifs avec ceux de la société au sens large. Quatrièment, volontairement ou contraintes par la loi, la plupart des entreprises, surtout les plus grandes, produisent des rapports spécifiques ou consacrent une section spécifique de leurs rapports annuels pour discuter des questions de RSE.[9]

Enfin, plusieurs initiatives montrent que les effets et la dynamique de PS diffèrent en fonction de la nature de l'entreprise et de son secteur d'activité. Par exemple, de nombreuses institutions financières ont volontairement adopté des pratiques responsables de gestion environnementale et sociale se rapportant à l'industrie financière, telles que les Principes Équateur (*Equator Principles*)[10], les Principes de carbone (*Carbon Principles*)[11], et les Principes du climat (*Climate Principles*).[12] Cette dynamique de PS est également observée

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[7] http://www.vigeo.com/
[8] http://www.unpri.org/principles/
[9] Plus de la moitié des entreprises incluses dans le *Fortune 1000* publient des rapports spécifiques qui traitent des questions de RSE (Tsoutsoura, 2004). Certains états ont légiféré pour rendre obligatoire le reporting social et environnemental, telle la France qui exige des entreprises cotées de publier dans leur rapport annuel des informations sur la manière dont elles prennent en compte les conséquences sociales et environnementales de leur activité (loi sur les Nouvelles Régulations Économiques, appelée aussi loi NRE).
[10] http://www.equator-principles.com
[11] http://www.carbonprinciples.org
[12] http://www.theclimategroup.org/programs/the-climate-principles/

dans d'autres industries qui ont adopté volontairement des initiatives spécifiques. L'ensemble de ces initiatives ou actions illustrent l'engouement et le caractère irréversible de l'intégration de critères sociaux et environnementaux dans les évaluations des entreprises.

1.2. Mesure de la performance sociale

Dans les études empiriques, PS a été appréhendée par diverses mesures. Certains ont proposé une mesure dichotomique traduisant l'appartenance à un indice social (McWilliams et Siegel, 2000; Lee et Faff, 2009), ou encore l'adoption d'une certification sociale ou environnementale (Bouslah *et al.,* 2010). D'autres ont utilisé des mesures plus générales allant des actions philanthropiques, des données environnementales (celles du *Toxics Release Inventory*), à des indices de réputation (par exemple, l'indice du magazine *Fortune*), ou encore des notations couvrant plusieurs aspects ou dimensions de la RSE telles que celles de KLD (Griffin et Mahon, 1997; Margolis et Walsh, 2003). La notation de KLD, mesure multidimensionnelle de la RSE, a souvent été utilisée dans les études empiriques (Mattingly et Berman, 2006; Harjoto et Jo, 2011). Waddock (2003) souligne la pertinence d'utiliser cette mesure parce qu'elle est factuelle, fiable, de vaste portée, et maintenue avec cohérence et transparence.

Cette mesure permet d'évaluer plusieurs dimensions de la PS qui peuvent être regroupées en deux catégories: les dimensions qualitatives et les dimensions d'exclusion. Les dimensions qualitatives comprennent à la fois les actions positives (forces sociales ou *strengths*) et les actions négatives (faiblesses sociales ou *concerns*). Les dimensions qualitatives comprennent les relations avec les communautés, celles avec les employés, la diversité, l'environnement, le produit, les droits de l'homme et la gouvernance d'entreprise. En revanche, les dimensions d'exclusion comprennent uniquement des actions négatives (faiblesses sociales ou *concerns*) telles que perçues par certains acteurs qui considèrent que ces activités sont nocives pour l'être humain et son environnement. Les dimensions d'exclusion incluent les entreprises dont les activités sont dans l'une des industries suivantes : l'alcool, les jeux de hasard, les armes à feu, le militaire, le nucléaire, et le tabac. Pour illustrer l'utilisation de ces dimensions, les gestionnaires des indices socialement responsables (par exemple, les indices *Dow Jones*

Sustainability Index (DJSI) et *Domini Social Index* (DSI 400)), utilisent les dimensions qualitatives pour sélectionner les entreprises ayant certaines caractéristiques souhaitables, et utilisent les dimensions d'exclusion pour écarter de leur processus de sélection les entreprises ayant certains attributs indésirables.

Cette thèse utilise les notations sociales de KLD pour mesurer PS pour un large échantillon d'entreprises américaines. Dans les premier et troisième articles, nous utilisons trois mesures agrégées des différentes dimensions de PS. La première mesure est une mesure agrégée de PS qui combine les forces et les faiblesses sociales de l'entreprise. Les deuxième et troisième mesures sont, respectivement, des mesures agrégées des forces et des faiblesses de toutes les dimensions de PS.[13] Rappelons que l'échantillon du premier article est composé uniquement d'entreprises non financières, alors que celui du troisième article ne comprend que les entreprises financières. Le choix d'utiliser des mesures agrégées de PS est motivé par des raisons de comparabilité avec les études antérieures. En effet, une grande majorité de ces études ont utilisé une mesure agrégée de PS qui combine plusieurs dimensions, sans toutefois distinguer les forces des faiblesses sociales des entreprises.

Cependant, l'agrégation de toutes les dimensions en une seule mesure globale peut masquer les effets des dimensions individuelles (Griffin et Mahon, 1997; Johnson et Greening, 1999; Hillman et Keim, 2001; Rehbein *et al.,* 2004). De plus, l'hypothèse implicite que chaque force et chaque faiblesse sociale a la même importance que les autres est inappropriée (Mattingly et Berman, 2006; Sharfman et Fernando, 2008). Ainsi, Mattingly et Berman (2006) soutiennent que les actions sociales positives (forces) et négatives (faiblesses) sont distinctes empiriquement et conceptuellement et ne devraient pas être combinées. Ces auteurs ont trouvé que les forces et les faiblesses sociales, telles que mesurées par les données KLD, pour la même dimension ne covarient pas dans des directions opposées, c'est à dire, elles ne mesurent pas des côtés opposés du même construit sous-jacent. En résumé, les recherches antérieures soulignent l'importance de distinguer entre une mesure agrégée (ou globale) et des mesures désagrégées de PS.

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[13] La mesure agrégée de PS combinant les forces et les faiblesses sociales, ainsi que la mesure agrégée des faiblesses sont calculées avec et sans les dimensions d'exclusion, et ce, afin d'examiner leur impact sur les résultats.

Dans les deuxième et troisième articles, nous utilisons d'abord des mesures des dimensions individuelles de PS qui combinent les forces et les faiblesses de chaque dimension de PS, ensuite nous utilisons des mesures distinctes pour les forces et les faiblesses pour chaque dimension de PS. Ainsi, notre travail de recherche vise à examiner l'ensemble des relations potentielles entre d'une part, PS agrégée et ses dimensions, et d'autre part, le risque pour les entreprises non financières (articles 1 et 2, respectivement) et les entreprises financières (article 3). La prochaine section discutera les études empiriques qui ont examiné la relation entre PS et certaines mesures de risque.

2. Les études empiriques de la relation entre performance sociale et risque

En dépit de l'abondance des études portant sur la relation entre les performances sociale et financière,[14] les résultats demeurent mitigés. Même si la majorité de ces études ont utilisé certaines mesures de risque comme variable de contrôle dans leurs régressions (par exemple, l'endettement, ratio valeur aux livres / valeur marchande, bêta et écart-type des rendements, risque de faillite), très peu de recherches ont examiné la relation entre la performance sociale (PS) et le risque de l'entreprise (Lee et Faff, 2009; Oikonomou *et al.*, 2012). Notre thèse s'inscrit dans ce courant récent, et nos diverses mesures de risque sont les variables d'intérêts et sont donc les variables dépendantes dans la majorité de nos régressions. Dans notre revue de littérature, nous focalisons sur les études pertinentes pour notre travail de recherche.

Quelques études empiriques ont examiné la relation entre PS et certaines mesures du risque de l'entreprise dans le contexte américain (Spicer, 1978; McGuire *et al.*, 1988; Feldman *et al.*, 1997; Orlitzky et Benjamin, 2001; Goss, 2007; Sharfman et Fernando, 2008; Lee et Faff, 2009; Luo et Bhattacharya, 2009; Oikonomou *et al.*, 2012), dans le contexte canadien (Boutin-Dufresne et Savaria, 2004) et dans le contexte britannique (Salama *et al.*, 2011). Il semble qu'un consensus se dégage autour de la relation entre PS et le risque. En effet, dans leur méta-analyse basée sur 18 études, Orlitzky et Benjamin (2001) concluent que SP est corrélée négativement avec diverses mesures du risque, et que la corrélation est plus

[14] Dans ces études, la performance financière (PF) a été mesurée par les rendements des cours bousiers (par exemple, Galema *et al.*, 2008; Godfrey *et al.*, 2009) ou par des ratios financiers (par exemple, Waddock et Graves, 1997; Harjoto et Jo, 2008).

forte avec les mesures du risque calculées à partir des cours boursiers relativement aux mesures de risque calculées à partir des données comptables. Ainsi, par exemple, Spicer (1978) a trouvé que les entreprises moins polluantes ont un risque total (écart-type des rendements) et un risque systématique (bêta) moins élevés relativement aux entreprises plus polluantes. En adoptant une approche plus globale de PS, McGuire *et al.* (1988) ont trouvé que le risque financier (bêta et écart-type des rendements) et le risque comptable (approximé par l'endettement) sont corrélés négativement avec la performance sociale telle que mesurée par l'indice de réputation *Fortune*.

Certaines études ont plutôt examiné l'impact de PS sur le coût du capital. Plusieurs de ces études se concentrent sur une seule dimension de PS telle que la performance environnementale mesurée par les données du *Toxics Release Inventory* (Feldman *et al.* 1997; Sharfman et Fernando, 2008). Les résultats de ces études montrent que la performance environnementale est reliée négativement au coût des capitaux propres. D'autres études ont plutôt examiné la relation entre PS et le coût de la dette privée, ainsi que la détresse financière (risque de faillite). Goss (2007) a trouvé une relation non linéaire entre PS, mesurée par KLD, et le coût de la dette privée pour les entreprises américaines. Les entreprises ayant une PS faible paient des intérêts plus élevés sur leurs dettes privées, tandis que les entreprises ayant une PS élevée ne sont pas récompensées par des intérêts plus faibles. Goss (2007) a trouvé également une relation négative entre la performance sociale et la détresse financière, telle que mesurée par la probabilité de défaut.

Peu d'études ont examiné le lien entre le risque idiosyncrasique (risque spécifique ou diversifiable) et la performance sociale. Parmi celles-ci, Boutin-Dufresne et Savaria (2004) ont examiné un échantillon d'entreprises canadiennes et ont trouvé une relation négative entre le risque idiosyncrasique et la performance sociale mesurée par CSID[15]. Lee et Faff (2009) ont utilisé l'indice *Dow Jones Sustainability Index* (DJSI) pour mesurer PS et ont trouvé que des portefeuilles d'entreprises ayant des PS inférieures sont plus rentables relativement à des portefeuilles d'entreprises ayant des PS supérieures. Ils expliquent leur résultat par le fait que les entreprises ayant des PS supérieures (inférieures) ont un risque idiosyncratique faible

[15] Cette base de données est compilée à partir des données préparées par la firme *Michael Jantzi Research Associates*.

(élevé). D'autres études ont examiné la relation entre le risque systématique (risque non diversifiable) et la performance sociale. Salama *et al.* (2011) ont trouvé une relation négative entre le risque systématique et une mesure de PS incluant deux dimensions (communauté et environnement) au Royaume-Uni entre 1994 et 2006. Oikonomou *et al.* (2012) ont examiné la relation entre la PS mesurée par KLD, et le risque systématique (bêta) pour les entreprises du S&P 500 entre 1992 et 2009. Ils ont trouvé une relation négative (positive) entre le risque systématique et une mesure agrégée combinant les forces (faiblesses) sociales et plus spécifiquement que les faiblesses en matière de relations avec la communauté, les employés et l'environnement sont positivement corrélées avec le risque systématique.

Enfin, quelques études ont examiné la relation entre PS et des caractéristiques de l'entreprise utilisées dans la littérature comme une approximation du niveau de risque. Par exemple, Galema *et al.* (2008) ont utilisé la base de données KLD et ont trouvé que le ratio valeur aux livres / valeur marchande a une relation négative avec les dimensions de la diversité, l'environnement et le produit, alors que ce ratio a une relation positive avec la dimension de gouvernance. Ils concluent que PS réduit le risque de l'entreprise en réduisant son ratio valeur aux livres / valeur marchande. La prochaine section présentera les arguments théoriques qui pourraient justifier la relation entre PS et le risque.

3. Les arguments théoriques justifiant la relation entre performance sociale et risque

La littérature financière et celle sur la responsabilité sociale des entreprises mettent en évidence plusieurs arguments théoriques qui pourraient expliquer la nature de la relation entre PS et le risque. Ces arguments incluent la théorie des parties prenantes, la théorie des ressources disponibles, la théorie de la gestion des risques, l'argument de la reconnaissance des investisseurs ou l'étendue de la base des investisseurs d'une entreprise, et enfin l'hypothèse de l'opportunisme des gestionnaires. Le tableau 1 résume ces arguments théoriques.

Le premier argument, celui de la théorie des parties prenantes (*stakeholder theory*) prédit qu'une PS supérieure (inférieure) entraîne une baisse (hausse) du risque. Les entreprises ayant une PS supérieure peuvent anticiper des risques financiers et d'exploitation (McGuire

et al., 1988) et des risques environnementaux et sociaux (Feldman *et al.,* 1997; Sharfman et Fernando, 2008) moindres. En outre, PS pourrait réduire l'asymétrie d'information si elle est considérée comme un signal de qualité de gestion (McGuire *et al.,* 1988; Waddock et Graves, 1997). Dans ce cas, les entreprises ayant une PS supérieure (inférieure) peuvent être perçues par les investisseurs comme des placements moins (plus) risqués. Par exemple, une PS supérieure peut inciter les investisseurs à percevoir l'entreprise comme étant moins sujette à des crises sociales, et d'avoir un meilleur positionnement futur pour être en conformité avec des réglementations plus strictes dans les domaines sociaux ou environnementaux.

Le deuxième argument, celui de la théorie des ressources disponibles (*slack resources theory*), suggère que la disponibilité des ressources, par exemple de meilleurs résultats financiers, fournissent à l'entreprise la possibilité de faire des investissements en matière de RSE améliorant ainsi leur PS (McGuire *et al.,* 1988; Waddock et Graves, 1997), et potentiellement réduire leur risque. Ainsi, les entreprises rentables peuvent améliorer leur PS et potentiellement réduire leur risque.

Le troisième argument, celui de la gestion des risques sociaux et environnementaux, suggère également une relation négative entre PS et le risque. C'est-à-dire, une PS élevée (faible) peut entraîner une baisse (hausse) du risque. La gestion des risques implique l'identification des sources de risque, l'évaluation des probabilités de leur occurrence et de trouver les solutions optimales pour réduire leur impact sur la performance globale de l'entreprise (Capron et Quairel-Lanoizelée, 2010). Sharfman et Fernando (2008) montrent qu'une meilleure gestion des risques environnementaux (par exemple, réduction des émissions toxiques et de la pollution) réduit les probabilités d'une crise environnementale qui pourrait affecter négativement les flux monétaires futurs d'une entreprise (par exemple, les procès judiciaires, les frais de nettoyage dans le cas des accidents environnementaux, les amendes et les dommages à la réputation). La perspective de gestion du risque suggère que les investissements en matière de RSE peuvent générer un capital moral et une crédibilité, qui permet d'atténuer l'impact sur les flux monétaires d'une entreprise en cas de crise ou d'événements négatifs (Godfrey *et al.,* 2009).

Le quatrième argument est celui de la reconnaissance des investisseurs ou l'étendue de la base des investisseurs d'une entreprise, suggère également une relation négative entre PS et le risque. Le modèle d'équilibre développé par Merton (1987) suggère des différences de prix induites par des différences de la demande pour différents types de titres. En particulier, le modèle prédit que le risque de l'entreprise diminue à mesure que le nombre de ses actionnaires augmente. Si les entreprises ayant une PS supérieure ont tendance à avoir des bases d'investisseurs plus grandes, ces entreprises encoureront moins de risque. De même, si les entreprises ayant une PS faible ont tendance à avoir des bases d'investisseurs plus petites, ces entreprises auront un risque plus élevé. La plupart des modèles théoriques portant sur la relation entre PS et les rendements attendus (par exemple, Heinkel et *al.,* 2001; Barnea et *al.,* 2005; Mackey et *al.,* 2007) sont basés sur des différences dans les préférences des investisseurs et prédisent, comme dans le modèle de Merton (1987), qu'une demande excédentaire pour les titres des entreprises ayant une PS élevée permettra de réduire leur risque. En même temps, une faible demande pour les titres des entreprises ayant une PS faible mènera à un risque plus élevé parce que les investisseurs exigent des primes supplémentaires pour compenser le manque de possibilités de partage des risques.

Ces quatre arguments théoriques suggèrent que PS devrait être négativement reliée au risque de l'entreprise. Toutefois, l'hypothèse de l'opportunisme des gestionnaires suggère plutôt une relation positive entre PS et le risque. Les gestionnaires peuvent sur-investir dans les activités de RSE pour leur bénéfice privé (par exemple, pour améliorer leur réputation en tant que bons citoyens sociaux), et ce, même au détriment des actionnaires (Barnea et Rubin, 2010). Cespa et Cestone (2007) montrent que les gestionnaires peuvent s'engager stratégiquement en adoptant un comportement socialement responsable pour gagner le soutien des parties prenantes (par exemple, les activistes sociaux et environnementalistes), réduisant ainsi la probabilité de leur remplacement lors des prises de contrôle de l'entreprise. Par conséquent, les relations des dirigeants avec les parties prenantes autres que les actionnaires (par exemple, les interactions avec les communautés locales, ONG, syndicats, et les politiciens) peuvent devenir une stratégie d'enracinement (*entrenchment*) effective, surtout pour les cadres moins performants, ceux ayant des mauvais résultats financiers.

Table 1 : Typologie des relations potentielles entre la performance sociale et le risque*

Théorie	Rationalité	PS agrégée ↔ Risk	Forces (*Strengths*) ↔ Risk	Faiblesse (*Concerns*) ↔ Risk
Hypothèse de la bonne gestion (*stakeholder theory*)	Une PS supérieure signale une bonne qualité de gestion de l'entreprise, ce qui induit les investisseurs à la considérer comme moins risquée.	Négative	Négative	Positive
Hypothèse des ressources disponibles (*Slack resources theory*)	La disponibilité des ressources (humaines, financières ou autres) augmente la capacité de l'entreprise à améliorer sa PS et potentiellement réduire son niveau de risque.	Négative	Négative	Positive
Hypothèse de la gestion des risques sociaux et environnementaux	Une vision défensive de l'entreprise qui vise à intégrer la gestion des risques sociaux et environnementaux dans la fonction de gestion des risques au niveau de l'ensemble de l'entreprise.	Négative	Négative	Positive
Hypothèse de la reconnaissance des investisseurs	Une PS supérieure attire plus d'investisseurs, ce qui augmente la base d'actionnaires, réduisant ainsi le risque; préférences des investisseurs.	Négative	Négative	Positive
Hypothèse de l'opportunisme des gestionnaires	Comportements opportunistes des gestionnaires : sur-investir dans les activités de RSE pour leur bénéfice privé, même au détriment des actionnaires.	Positive	Positive	Positive
Hypothèse de la neutralité de la relation entre PS et le risque	PS n'a aucun impact significatif sur le risque pour diverses raisons: difficultés des investisseurs à évaluer les impacts réels de PS, biais méthodologiques, etc.	∅	∅	∅

*Source: Adapté par l'auteur à partir de divers travaux décrits dans la présente section.

Finalement, il est possible qu'il n'y ait simplement pas de relation entre PS et le risque, et ce, pour plusieurs raisons telles que les difficultés des investisseurs à évaluer les impacts réels de PS et les biais méthodologiques.

Les quatres premiers arguments théoriques mentionnés dans le tableau 1 prédisent que la mesure agrégée de PS, qui combine les forces et les faiblesses, serait négativement reliée au risque de l'entreprise. Toujours selon ces quatres premiers arguments théoriques, la mesure agrégée des forces serait négativement reliée au risque, alors que la mesure agrégée des faiblesses le serait positivement.

Toutefois, selon l'hypothèse de l'opportunisme des gestionnaires, la mesure agrégée de PS, qui combine les forces et les faiblesses, serait positivement reliée au risque de l'entreprise alors que des mesures distinctes des forces et des faiblesses le seraient positivement.

Les mesures agrégées de PS, des forces uniquement et celles des faiblesses uniquement d'une entreprise sont la combinaison de ses performances par rapport à plusieurs dimensions (environnement, employés, produit, etc.) Les performances de l'entreprise dans chacune de ces dimensions ne sont pas nécessairement les mêmes. Ainsi une entreprise très performante au niveau de ses relations avec ses employées peut très bien être très peu performante au niveau de l'environnement, par exemple. Il est également possible que l'entreprise peut avoir de bonnes (ou mauvaises) performances par rapport à plusieurs dimensions.[16] De plus, les investisseurs peuvent percevoir les dimensions individuelles de PS différemment. Ainsi, certains investisseurs peuvent accorder une importance plus élevée à l'aspect environnemental alors que d'autres peuvent ne considérer que la qualité des relations avec les employés. Par conséquent, on pourrait s'attendre à des relations différentes entre les mesures de risque et les dimensions individuelles de PS. En d'autres termes, les dimensions de PS n'affectent pas le risque uniformément, certaines d'entre elles affectant le risque de manière plus prononcée que d'autres.

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[16] Le deuxième article fournit à partir de notre base de données des exemples illustratifs de ces aspects.

La mesure d'une dimension spécifique de PS est la différence entre les forces et les faiblesses de cette dimension. Cette mesure peut être positive (négative) si les forces sont supérieures (inférieures) aux faiblesses. Cette mesure peut aussi être nulle si l'entreprise a le même nombre de forces et faiblesses sociales. Puisque les forces et les faiblesses sont conceptuellement distinctes (Mattingly et Berman, 2006) et sont soumises à des dynamiques différentes (McGuire *et al.,* 2003), nous examinons leur impact sur le risque séparément.

Certains arguments théoriques du tableau 1 ont été largement utilisés dans l'examen de la relation entre PS et la performance financière. Toutefois, peu d'études les ont utilisés dans le cadre de la relation entre PS et le risque. En nous basant sur les arguments théoriques mentionnés dans le tableau 1, nous examinons la relation entre le risque, appréhendé selon diverses mesures, et la PS tant agrégée qu'individuelle, ou spécifique (par dimension).

Le premier article examine la relation entre la performance sociale, au niveau global, et le risque des entreprises non financières. Nous examinons les relations entre d'une part, des mesures agrégées de PS, des forces et des faiblesses sociales, et d'autre part, les risques total, systématique et idiosyncratique.

Le deuxième article examine l'impact des dimensions individuelles de PS sur le risque des entreprises non financières. Nous utilisons d'abord des mesures des dimensions individuelles de PS qui combinent les forces et les faiblesses, ensuite nous utilisons des mesures distinctes pour les forces et pour les faiblesses pour chaque dimension de PS.

En se concentrant uniquement sur les institutions financières, le troisième article examine la relation entre la performance sociale, tant au niveau global qu'au niveau de chaque dimension, et le risque. Nous examinons les relations entre d'une part, des mesures agrégées de PS, celle des forces et celle des faiblesses sociales, et d'autre part, le risque total et ses composantes systématique et idiosyncratique, ainsi que la mesure du Valeur à Risque (Value-at-Risk ou VaR). Nous examinons également l'impact des dimensions individuelles de PS sur ses quatres mesures de risque des institutions financières.

RÉFÉRENCES

Barnea, A., et Rubin, A. (2010), «Corporate social responsibility as a conflict between shareholders», *Journal of Business Ethics*, 97, 71–86.

Barnea, A., Heinkel. R., et Kraus, A. (2005), «Green investors and corporate investment», *Structural Change and Economic Dynamics*, 16, 332–346.

Baron, D. P., Harjoto, M. A., et Jo, H. (2011), «The Economics and Politics of Corporate Social Performance», *Business and Politics*, 13, 1–46.

Bouslah, K., M'Zali, B., Turcotte, M-F., et Kooli, M. (2010), « The Impact of Forest Certification on Firm Financial Performance in Canada and the U.S. », *Journal of Business Ethics*, 96, 551-572.

Boutin-Dufresne, F. et Savaria, P. (2004), « Corporate Social Responsibility and Financial Risk», *Journal of Investing*, 13, 57-66.

Capron, M., et Quairel-Lanoizelée, F. (2010), *La responsabilité sociale d'entreprise*. Édition La Découverte, Paris.

Carroll, A. B. (1979), «A three-dimensional conceptual model of corporate performance», *The Academy of Management Review*, 4, 497-505.

Carroll, A. B. (1999), «Corporate Social Responsibility: Evolution of a Definitional Construct», *Business and Society*, 38, 268-295.

Carroll, A. B. (2000), «A commentary and an overview of key questions on corporate social performance measurement», *Business and Society*, 39, 466-478.

Cespa, G., et Cestone, G. (2007), «Corporate social responsibility and managerial entrenchment», *Journal of Economics and Management Strategy,* 16, 741-771.

Diamond, D. W., et Rajan, R. G. (2000), «A Theory of Bank Capital», *Journal of Finance*, 55, 2431-2465.

Feldman, J., Soyka, P., et Ameer, P. (1997), «Does improving a firm's environmental management system and environmental performance result in a higher stock price?», *Journal of Investing*, 6, 87-97.

Freeman, R. E. 1984. *Strategic management: A stakeholder approach*. Boston: Pitman/Ballinger.

Galema, R., Plantinga, A., et Scholtens, B. (2008), «The stocks at stake: Return and risk in socially responsible investment», *Journal of Banking and Finance*, 32, 2646–2654.

Godfrey, P. C., Merrill. C. B., et Hansen, J. M. (2009), «The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis», *Strategic Management Journal*, 30, 425-445.

Goss, A. (2007), « Essays on corporate social responsibility and financial performance », Thèse de doctorat, York University, Toronto.

Griffin, J. J. et Mahon, J. F. (1997), «The Corporate Social Performance and Corporate Financial Performance Debate: Twenty-five years of incomparable research», *Business and Society*, 36, 5-31.

Harjoto, M. A., et Jo, H. (2008), «Corporate social responsibility and operating performance», *Journal of the Academy of Business and Economics*, 8, 59-71.

Harjoto, M.A., et Jo, H., (2011), « Corporate governance and CSR nexus », *Journal of Business Ethics*, 100, 45-67.

Heinkel, R., Kraus, A., et Zechner. J. (2001), « The Effect of Green Investment on Corporate Behavior », *Journal of Financial and Quantitative Analysis*, 36, p. 431-449.

Hillman, A., et Keim, G. D. (2001), «Shareholder value, stakeholder management, and social issues: What's the bottom line? », *Strategic Management Journal*, 22, 125-139.

Johnson, R. D., et Greening, D. W. (1999), «The effects of corporate governance and institutional ownership types on corporate social performance», *Academy of Management Journal*, 42, 564–576.

Jorion, P. 2003. *Financial Risk Manager Handbook.* John Wiley & Sons, Inc., New Jersey.

Lee, D. D., et Faff, R. W. (2009), «Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective», *The Financial Review*, 44, 213-237.

Luo, X., et Bhattacharya, C. B. (2009), «The Debate over Doing Good: Corporate Social Performance, Strategic Marketing Levers, and Firm-idiosyncratic Risk», *Journal of Marketing*, 73, 198-213.

Mackey, A., Mackey, T. B., et Barney, J. B. (2007), «Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies», *Academy of Management Review*, 32, 817 – 835.

Margolis, J. D., et Walsh, J. P. (2003), «Misery loves companies: rethinking social initiatives by business», *Administrative Science Quarterly*, 48, 268-305.

Mattingly, J. E., et Berman, S. L. (2006), «Measurement of Corporate Social Action: Discovering Taxonomy in the Kinder Lydenberg Domini Ratings Data», *Business and Society*, 45, 20-46.

McGuire, J. B., Sundgren, A., et Schneeweis, T. (1988), «Corporate Social Responsibility and Firm Financial Performance», *Academy of Management Journal*, 31, 854-872.

McGuire, J., Dow, S., et Argheyd, K. (2003), «CEO incentives and corporate social performance», *Journal of Business Ethics*, 45, 341-359.

McWilliams, A. et Siegel, D. (2000), «Corporate Social Responsibility and Financial Performance: Correlation or Misspecification?», *Strategic Management Journal*, 21, 603-609.

Merton, R.C. (1987), «A simple model of capital market equilibrium with incomplete information», *Journal of Finance*, 42, 483–510.

Oikonomou, I., Brooks, C., et Pavelin, S. (2012), «The Impact of Corporate Social Performance on Financial Risk and Utility: A Longitudinal Analysis», *Financial Management*, 41, 483–515.

Orlitzky M. et Benjamin J. D. (2001), «Corporate Social Performance and Firm Risk: A meta-analytic Review», *Business and Society*, 40, 369-396.

Orlitzky M., Schmidt F.L. et Rynes S.L. (2003), «Corporate social and financial performance: a meta-analysis», *Organization Studies*, 24, 403-441.

Pava, M. L., et Krausz, J. (1996), «The Association Between Corporate Social-Responsibility and Financial Performance: The Paradox of Social Cost», *Journal of Business Ethics*, 15, 321-357.

Preston, L. E., et O'Bannon, D. P. (1997), «The Corporate Social-Financial Performance Relationship», *Business and Society*, 36, 419-429.

Rehbein, K., Waddock, S.A., et Graves, S. B. (2004), «Understanding shareholder activism: Which corporations are targeted? », *Business and Society*, 43, 239-267.

Roman, M. R., Hayibor, S., et Agle, B. R. (1999), «The Relationship Between Social and Financial Performance: Repainting a Portrait », *Business and Society*, 38, 109-125.

Salama, A., Anderson, K., et Toms, J. S. (2011), «Does community and environmental responsibility affect firm risk: Evidence from UK panel data 1994-2006», *Business Ethics: A European Review*, 20, 192-204.

Sharfman, M. P., et Fernando, C. S. (2008), «Environmental risk management and the cost of capital», *Strategic Management Journal*, 29, 569-592.

Social Investment Forum (SIF), 2010 Report on Socially Responsible Investing Trends in the United States. http://www.ussif.org/

Social Investment Organization (SIO), Canadian Socially Responsible Investment Review 2010. www.socialinvestment.ca

Spicer, B. H. (1978), «Investors, corporate social performance, and information disclosure: An empirical study», *The Accounting Review*, 53, 94-111.

Starks, L. T. (2009), «Corporate Governance and Corporate Social Responsibility: What Do Investors Care about? What Should Investors Care about?», *The Financial Review*, 44, 461-468.

Tsoutsoura, M. (2004), «Corporate social responsibility and financial performance», Document de recherche, Center for Responsible Business, Haas School of Business, University of California at Berkeley.

Ullmann, A. A. (1985), «Data in Search of Theory: A Critical Examination of the Relationship Among Social Performance, Social Disclosure, and Economic Performance of US Firms», *Academy of Management Review*, 10, 540-577

Waddock, S. A., et Graves, S. B. (1997), «The Corporate Social Performance-Financial Performance Link», *Strategic Management Journal*, 18, 303-319.

Waddock, S.A. (2003), «Myths and realities of social investing», *Organization and Environment*, 16, 369-380.

Wood, D.J. (1991), «Corporate social performance revisited», *Academy of Management Review*, 16, 691-718.

CHAPITRE I

ARTICLE 1

FIRM RISK AND SOCIAL PERFORMANCE

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FIRM RISK AND SOCIAL PERFORMANCE

Abstract

This paper examines the relation between firm risk and social performance (SP) using 16,599 U.S. firm-year observations covering the period 1991-2007. We find that SP is related to a firm's total risk mainly due to idiosyncratic risk. Specifically, both concerns and strengths scores are positively related to the firm's volatility and idiosyncratic risk. There is a bi-directional causality between firm's risk and strengths, and a unidirectional causality from firm's risk to concerns. There is also evidence of an asymmetric relation where the impact of concerns on volatility and idiosyncratic risk is stronger than the impact of strengths.

Keywords: Volatility, systematic risk, idiosyncratic risk, social performance, strengths, concerns, causality, endogeneity, simultaneity.

1.1. Introduction

Several indicators support the claim that corporate social responsibility (CSR) grew in importance within the financial community during the last two decades. First, there has been an emergence and growth of specialized investment firms whose role is to monitor firms' behavior in social domains and to provide social ratings for these firms (e.g., MSCI ESG STATS[17] in the US, Sustainalytics which operates globally[18], and EIRIS in the UK[19]). Second, several mutual funds and indices that select firms on the basis of CSR criteria have been developed (e.g., Dow Jones Sustainability Indexes, Domini 400 Social Index, Calvert Social Index, FTSE4Good Index, and Jantzi Social Index). Third, there is an increased interest among investors in CSR issues. As of 2010, assets in social responsible investing (SRI) represent 12.2% of all assets under management in the US and 19.1% in Canada (SIO, 2010; SIF, 2010). Also, major institutional investors from different countries have signed the Principles for Responsible Investment (PRI) protocol launched in April 2006.[20] Finally, most firms, especially larger ones, produce specific reports or dedicate a specific section of their annual reports to discuss CSR issues.[21]

This growing importance of CSR has fueled much research which tried mostly to link CSR or social performance (SP) to financial performance (FP).[22] Unfortunately, the numerous empirical studies of the relationship between SP and FP yield mixed and inconclusive results (Margolis and Walsh, 2003; Orlitzky *et al.,* 2003; Baron *et al.,* 2011). We are still far from a definitive consensus regarding this relationship (Baron *et al.*, 2011). Unlike studies of the relationship between SP and FP, studies that examine the relation between SP and firm risk are sparse and problematic (Starks, 2009; Lee and Faff, 2009; Oikonomou *et al.,* 2012). For example, which type of risk matters: systematic or idiosyncratic risk? Some studies focus only on systematic risk (e.g., Salama *et al., 2011*; Oikonomou *et*

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[17] MSCI ESG STATS (former KLD Research & Analytics, Inc (KLD)). For simplicity, we use the KLD abbreviation.

[18] Sustainalytics was formed from the merger between the Dutch firm "Sustainalytics" and the Canadian firm "Jantzi Research Inc" in August 2009 (http://www.sustainalytics.com/).

[19] http://www.eiris.org/

[20] http://www.unpri.org/principles/

[21] More than half of the Fortune 1000 firms issue CSR reports (Tsoutsoura, 2004).

[22] The terms CSR and SP are used interchangeably throughout the paper.

al., 2012), whereas others focus only on idiosyncratic risk (e.g., Boutin-Dufresne and Savaria, 2004; Lee and Faff, 2009; Goss, 2012).[23] For example, Boutin-Dufresne and Savaria (2004) examine a sample of Canadian firms over the period 1995-1999 and find a negative relationship between idiosyncratic risk and an aggregate measure of SP. Lee and Faff (2009) use the Dow Jones Sustainability Index (DJSI) as a SP proxy and find that portfolios of firms having lower SP outperform portfolios of firms with superior SP. They also find that leading (lagging) SP firms exhibit significantly lower (higher) idiosyncratic risk. They conclude that higher returns for lagging SP firms compensate for higher idiosyncratic risk. Luo and Bhattacharya (2009) measured SP for 2002 and 2003 with *Fortune*'s Most Admired Companies for 541 large firms. They find that higher SP lowers a firm's idiosyncratic risk for firms with higher versus lower advertising, but that a simultaneous pursuit of SP, advertising, and R&D increase idiosyncratic risk. They also find a negative relationship between systematic risk (CAPM beta) and their SP proxy. Goss (2012) find that concerns (strengths), constructed using principal components analysis of KLD data, are positively (negatively) related to idiosyncratic risk measured using vector autoregressive model. He concludes that idiosyncratic risk is more sensitive to concerns than it is to strengths.

Other studies examine the relationship between systematic risk and SP arguing that idiosyncratic risk is irrelevant since it can be diversified away through diversification. For example, Salama *et al.* (2011) find a negative relationship between an SP measure combining two dimensions (Community and Environment) and systematic risk for a sample of firms in the UK between 1994 and 2006. Oikonomou *et al.* (2012) examine the relation between social performance, measured using KLD data, and systematic risk (market beta) for S&P 500 firms (including utilities and financial firms unlike conventional practice) between the years 1992 and 2009. They find a negative (positive) relation between systematic risk and an aggregate strengths (concerns) measure.

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[23] Earlier studies use correlation analysis to examine this relationship (e.g., Spicer, 1978; McGuire *et al.*, 1988). Based on a meta-analysis of 18 studies that examine the relationship between SP and firm risk in any form, Orlitzky and Benjamin (2001) conclude that SP is negatively correlated with various measures of firm risk, and the correlation is stronger for market versus accounting measures. More recent studies find that SP is negatively related to the cost of equity capital (Feldman *et al.,* 1997; Sharfman and Fernando, 2008; El Ghoul *et al.,* 2011), and financial distress or default risk (Goss, 2007).

The objective of this paper is to examine the relationship between the firm's risk and social performance. We examine the relationships for total risk and its systematic and idiosyncratic risk components. Our direct test of the risk explanation associated with SP is based on a large panel of data covering the period 1991-2007. We hypothesize that greater SP improves the perception of the risk profile of the firm by the various suppliers of capital, particularly socially responsible investors (Heinkel *et al.*, 2001; Mackey and Barney, 2007). A higher SP may decrease the likelihood of social crises, and allow the firm to be better equiped in the future to be in compliance with more stringent regulations in social domains.

Our major findings can be summarized as follows. The aggregate measure SP which combines strengths and concerns is significantly and negatively related to stock return volatility and idiosyncratic risk. After splitting the aggregate measure SP into its strengths and concerns components, we find that both concerns and strengths scores are positively related to the firm's volatility and idiosyncratic risk. Firms having higher concerns (strengths) scores have higher total risk mainly due to increased idiosyncratic risk. There is also evidence of an asymmetric relation between firm risk and SP where the impact of concerns on volatility and idiosyncratic risk is stronger than the impact of strengths.

We also examine the reverse causality issue and find that total and idiosyncratic risks are significantly and positively associated with both concerns and strengths scores. Higher risk (total and idiosyncratic) induces both higher concerns scores and higher strengths scores. This implies that the relation between SP and a firm's risk also runs from risk to SP, that is risk causes SP. Finally, we examine the relation between firm risk and SP using vector autoregressive (VAR) approach and the associated Granger causality tests. The results show that there is a bi-directional causality between firm's risk and strengths. Specifically, higher total and idiosyncratic risks lead to higher strengths scores, while at the same time, higher strengths scores lead to higher total and idiosyncratic risks. There is also evidence of a unidirectional causality from firm's risk to concerns. That is, higher total and idiosyncratic risks lead to higher concerns scores. Moreover, we do not find any evidence of substitution effect between strengths and concerns.

Our study contributes to the literature in several respects. First, our study assesses the risk effects associated with SP which seems important for investors, corporate managers and policy makers. We provide a direct test of the risk management hypothesis (i.e., SP have an insurance effect). SP can be used strategically by firms to control risk which is consistent with a large literature showing that firms hedge to reduce cash flows volatility and costs of financial distress (e.g., see Stultz, 2002). Because of market imperfections, risk management matters and can be priced in financial markets (Stultz, 2002; Sharfman and Fernando, 2008). Second, unlike previous studies, we examine the relation between SP and total risk, its idiosyncratic and systematic components using the same dataset. This is important because it allows us to examine which type of risk matters: systematic or idiosyncratic risk? This question is not addressed in previous studies because they hypothesize that SP will affect either systematic or idiosyncratic risk, but not both. In this study we do not make such a restriction.[24] Although portfolio theory suggests that only systematic risk is relevant for asset pricing, the empirical evidence suggests that idiosyncratic risk is priced in financial markets (see e.g., Goyal and Santa-Clara, 2003; Ang *et al.*, 2006; Fangjian, 2009). This might be attributable to violation of the perfect capital market assumptions in the real world (e.g., costly and risky arbitrage and less diversification). Finally, we distinguish explicitly between the strengths and concerns of SP unlike most previous studies which combine them in a single measure. Our point is based on the argument showing that these two SP components are conceptually different (e.g., Mattingly and Berman, 2006) and therefore may have different effects on firm risk. In particular, we argue that concerns will have positive impact on risk because it is more likely that they affect both types of investors: traditional and socially responsible investors. However, the strengths may have negative (risk management view, stakeholder theory) or positive (over-investment view) impact on risk. Also, it is important to make the distinction between the strengths and concerns because there may be compensation effects (e.g., Greenwashing).

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[24] We extend Goss (2012) by examining the effects on both systematic and idiosyncratic risks (compared to only idiosyncratic risk in his analysis) and using different measures of SP and idiosyncratic risk. An important difference between our study and most previous studies that examine the relation between SP and risk is that their samples include financial and utility firms, whereas we exclude them from our analysis.

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework and research hypotheses. Section 3 describes the data and sample selection procedure. Section 4 describes the methodology used. Sections 5 and 6 present our empirical results. Section 7 concludes.

1.2. Theoretical framework and research hypotheses

One of the channels by which SP may affect firm financial performance or value is through its effect on reducing the risk that determines the expected return used to discount expected future cash flows. Assuming a given expected cash flow, a higher financial performance or firm value may result from the lower perceived riskiness associated with better social performance. Several theoretical arguments could justify theoretically the relation between SP and firm risk. These arguments involve the stakeholder theory, the slack resources theory, the risk management, the Merton (1987) argument on investor recognition or the size of a firm's investor base, and the over-investment hypothesis.

First, the stakeholder theory suggests that SP is negatively related to firm risk. Higher (lower) SP may reduce (increase) the perceived riskiness of the firm in the form of reduced (increased) financial and operating risks (McGuire *et al.*, 1988), and/or risk associated with social issues (Feldman *et al.,* 1997; Sharfman and Fernando, 2008; El Ghoul *et al.,* 2011). Investors may consider firms with higher (lower) SP as being less (more) risky investments provided they link SP with higher quality of management (McGuire *et al.*, 1988; Waddock and Graves, 1997). For instance, higher SP may reduce the probability that firms will face social crisis implying higher cash outflows (e.g., fines, compensation, and clean-up costs in the case of environmental accidents or problems associated with poor working conditions). Firms with lower social performance (i.e., those with poor SP ratings) may face several risks (e.g., damage to brand image and reputation; less trust of their stakeholders; consumer boycotts; existing shareholders may sell their shares, while potential investors may not want to buy their shares because of their poor SP).

Second, the slack resources theory suggests that the availability of slack resources (e.g., past profits) provide the opportunity for firms to improve their SP with its resultant reductions in risk and expected return through CSR investments (McGuire *et al.*, 1988; Waddock and Graves, 1997). The reduction of the perceived riskiness of the firm follows from the firm's improved standing within the financial community (e.g., bankers, investors, analysts).

Third, the risk management of social issues also suggests a negative relationship between firm risk and SP. Sharfman and Fernando (2008) argue that risk management of social issues (e.g., improved environmental risk management) is theoretically synonymous with strategic risk management. For instance, CSR investments (e.g., emissions and pollution reduction) reduce firm risk from known and unknown hazards, and consequently reduce the number of potential claimants on a firm's cash flows (e.g., potential fines, settlements, compliance costs). Godfrey (2005) argues that CSR activities can provide insurance mechanisms to preserve rather than generate financial performance. He argues that socially responsible behavior (e.g., corporate philanthropy) can act to reduce a firm's exposure to risk. More specifically, certain types of CSR activities can generate moral capital or goodwill which provides insurance-like protection (Godfrey *et al.*, 2009). Using an event study methodology, Godfrey et al. (2009) find that an SP measure combining the strengths of two dimensions (community and diversity) is positively related to the two-day cumulative abnormal returns following negative legal/regulatory actions against firms. Lee and Faff (2009) argue that firms with higher SP are able to reduce their idiosyncratic (business) risk relative to firms with low SP. This improvement of a firm's risk exposure to social issues may induce investors to perceive such firms as being less risky.

Finally, theoretical models of the relationship between SP and expected returns (e.g., Heinkel et al., 2001; Barnea et al., 2005; Mackey et al., 2007; Fama and French, 2007) assume differences in investor preferences, i.e., segmented capital market based on SP. In other words, there are two types of investors in the financial markets: traditional investors and socially responsible investors. Traditional investors make investment decisions based solely on financial criteria (anticipated payoffs and the access to overall consumption they provide). However, socially responsible investors make investment decisions based on both

financial and non-financial criteria (e.g., SP). Traditional investors have no tastes for specific assets as consumption goods, whereas socially responsible investors have tastes for assets as consumption goods that arc unrelated to returns (Fama and French, 2007). Unlike traditional investors, socially responsible investors get additional utility from holding stocks chosen based on their SP. The main prediction of these models is the price differences induced by demand differences for different types of stocks. Socially responsible stocks (i.e., stocks having higher SP) will have an excess demand which leads to lower risk and expected return (overvalued stocks). In contrast, socially irresponsible stocks (i.e., stocks having lower SP) will have a weak demand which leads to higher risk and expected return (undervalued stocks). This is because investors will require additional premium in order to hold stocks having lower SP as a compensation for the lack of risk sharing opportunities. That is, stocks having lower SP will be neglected by socially responsible investors (the "neglect effect").

The main prediction derived from the theoretical models of the relationship between SP and expected returns is similar to that derived from the equilibrium model with incomplete information developed by Merton (1987). That is, the "neglect effect" of some stocks and segmented markets (or price differences induced by demand differences for different types of stocks).[25] In particular, the model of Merton (1987) predicts that the firm's risk is negatively related to the size of a firm's investor base (i.e., the number of its shareholders). The Merton' argument on investor recognition or the size of a firm's investor base suggests a negative relationship between SP and firm risk. If a higher SP tends to increase investor base, then firms with higher SP will experience lower risk. Similarly, if a lower SP tends to decrease investor base, then firms with lower SP will experience higher risk. Lee and Faff (2009) argue that the model of Merton (1987) is consistent with the argument that the risk management and transparency practices associated with SP are valued by investors.

However, in contrast to the aforementioned arguments, the over-investment hypothesis or the managerial opportunism hypothesis suggests a positive relationship between SP and firm risk. In this case, SP can be viewed as private benefits that managers extract at the expense of

[25] Consistent with the "neglect effect" caused by SP, Hong and Kacperczyk (2009) find that sin stocks (tobacco, alcohol and gaming) are neglected by institutional investors subject to social norms such as pension funds. Sin stocks are less held by social norm-constrained institutions, receive less coverage from analysts and have higher expected returns (i.e., higher risk) than otherwise comparable stocks.

shareholders. For example, managers may choose to improve SP by over-investing in CSR activities in order to build their own personal reputation as good social citizens, even at the expense of shareholders (Barnea and Rubin, 2010). They may also improve SP to generate support from social and environmental activists in order to reduce the probability of their replacement in a future period (Cestone and Cespa, 2007). According to the over-investment hypothesis, SP is expected to be positively related to firm risk because of managerial entrenchment.

In summary, except the over-investment hypothesis, all theoretical arguments predict that a firm's risk is expected to be negatively related to SP. Based on these arguments, we hypothesize that higher (lower) SP reduces (increases) total firm risk and its components. This leads to our main hypothesis stated in its alternative form:

H_1^A: Social performance in aggregate is negatively related to firm risk.

Social performance in aggregate is the difference between strengths and concerns.

Since both strengths and concerns measures are positive by construction, a natural corollary to our first hypothesis is that the strengths (concerns) measure is expected to be negatively (positively) related to total firm risk and its components. This leads to our second and third hypotheses stated in their alternative forms:

H_2^A: The strengths measure is negatively related to firm risk.

H_3^A: The concerns measure is positively related to firm risk.

It is important to distinguish explicitly between the strengths and concerns of SP for several reasons. For instance, Mattingly and Berman (2006) argue that strengths and concerns are both empirically and conceptually distinct constructs and should not be combined. In our data, the correlation coefficient between strengths and concerns is about 0.24 which is significant at the 1% level. Since these two SP components are conceptually different, they may have different effects on firm risk. In particular, we argue that concerns will have positive impact on the firm's risk because it is more likely that concerns will affect equally

both types of investors (i.e., traditional and socially responsible investors). It follows that firms having higher concerns will be exposed to a higher risk. However, the strengths may have negative (e.g., risk management, stakeholder theory) or positive (over-investment view) impact on the firm's risk. This might be explained by the empirical evidence which suggests that investors may not agree on the value of the strengths and their impacts (see e.g., Ioannou and Serafeim, 2010; Edmans, 2011). Another important reason as to why we should make the distinction between the strengths and concerns is the possibility of substitution or compensation effects (e.g., Greenwashing). For example, firms may undertake CSR investments (i.e., increase their strengths) in order to compensate for current or future concerns.

It is also reasonable to expect the relation between concerns and firm risk to be stronger than that between strengths and firm risk. Stakeholders' responses to bad news (i.e., concerns) are likely to be more pronounced than those following good news (i.e., strengths). Mattingly and Berman (2006) argue that responses of stakeholders to positive and negative social actions are not symmetric, even within the same dimension. Lankoski (2009) argues that the economic impacts of SP are more positive for issues that reduce negative externalities (e.g., reducing or avoiding concerns) than for issues that generate positive externalities (e.g., having or increasing strengths). There is empirical evidence (e.g., Frooman, 1997; Godfrey *et al.,* 2009; Oikonomou *et al.*, 2012; Goss and Roberts, 2011; Goss, 2012) supporting this claim. This reasoning leads to our fourth hypothesis stated in its alternative form:

H_4^A: The relation between the concerns measure and firm risk is stronger than the relation between the strengths measure and firm risk.

1.3. Data and sample selection

The social performance data for U.S. firms from the MSCI ESG STATS (formerly KLD Research & Analytics, Inc or KLD) database has been used extensively by other researchers (e.g., Mattingly and Berman, 2006). Based on calendar year-end data, the database provides *Strength* ratings and *Concern* ratings for several binary indicators of seven qualitative

dimensions as well as *Concern* ratings for several indicators of six exclusionary dimensions. It also provides total counts of all strengths and concerns in each of these 13 dimensions. The seven **qualitative dimensions** are Community, Diversity, Employee relations, Environment, Product, Human Rights (formerly "*non-US operations*" before 2002), and Corporate Governance (formerly "*Other*" category before 2002). The six **exclusionary dimensions** are Alcohol, Gambling, Firearms, Military, Nuclear power, and Tobacco.

The qualitative dimension indicators include both positive and negative ratings (i.e., strengths and concerns), while the exclusionary dimensions only include negative ratings. The KLD ratings (either for strengths or concerns) indicate the presence or absence (by a 1 or zero value) of strengths and concerns (weaknesses) regarding numerous indicators (attributes) for a particular dimension. Given the nature of exclusionary dimensions which focus only on concerns, we perform our analysis with and without these screens. Appendix I presents a detailed description of the KLD database.

Our final sample consists of an unbalanced panel dataset of 16,599 firm-year observations for all non-financial and non-utility firms covered by four databases (MSCI ESG STATS or KLD, Thomson Reuters I/B/E/S, CRSP and COMPUSTAT) over the period 1991-2007 based on each firm's CUSIP. For many firms, we perform a hand-check to ensure a successful merging process. We obtain stock prices, stock returns, trading volumes, and shares outstandings from CRSP. Accounting data obtained from COMPUSTAT includes book value of common equity, net income, common dividends, long-term debt, investments, total assets, and fiscal year-end date. Analyst earnings forecasts data are obtained from Thomson Reuters I/B/E/S.

1.4. Methodology

1.4.1. Measuring social performance

Most empirical studies using the KLD data combine the various SP dimensions into one aggregate SP measure using different methods. For example, Graves and Waddock (1994)

and Waddock and Graves (1997) compute a weighted average index of SP based on eight KLD dimensions where the weights are based on opinions of a panel of three academic experts in social issues. Before averaging, they subtract the concerns from the strengths for each KLD dimension. Harjoto and Jo (2008) subtract the average concerns score from the average strengths score for each of the five KLD dimensions considered, and then compute an arithmetic average index of SP. Researchers also do not agree on whether to exclude exclusionary screens when measuring SP (e.g., included in Graves and Waddock (1994) and Waddock and Graves (1997) whereas excluded in Harjoto and Jo (2008)). Hillman and Keim (2001) consider both qualitative and exclusionary screens separately.

In this paper, we follow Harjoto and Jo (2008) and use strengths, concerns and aggregate measures of SP, which are respectively given by: [26]

$$Str_{it} = \frac{1}{D}\sum_{d=1}^{D}\left[\frac{1}{N_{STR}}\sum_{l=1}^{L} Strength_l\right]_{it} \quad (1); \qquad Con_{it} = \frac{1}{D}\sum_{d=1}^{D}\left[\frac{1}{N_{CON}}\sum_{j=1}^{J} Concern_j\right]_{it} \quad (2)$$

$$SP_{it} = Str_{it} - Con_{it} \quad (3)$$

where d refers to the KLD dimension, and D is the total number of KLD dimensions for a given year t and firm i. N_{STR} and N_{CON} are total maximum possible numbers of strengths and concerns, respectively, within a given KLD dimension for a given year. We also compute these measures of SP with and without exclusionary screens (dimensions) when applicable (i.e., when there are concerns in the formula).

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[26] We also consider other measures of social performance (e.g., the sum of the differences between "total strengths" and "total concerns" of each KLD dimension for a given year, divided by the total number of KLD dimensions for that year). All these measures are highly positively correlated with the measures considered here and provide virtually the same results.

1.4.2. Measuring Firm Risk

We use two measures of firm's total risk: (1) the annualized standard deviation from the monthly stock returns over the previous five years; and (2) the annualized standard deviation from the daily stock returns over the past year.[27] We compute systematic risk (market beta) and idiosyncratic (unsystematic) risk using the basic CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively, using the factors obtained from Kenneth French's web site:[28]

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \varepsilon_{it} \quad (4)$$

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \varepsilon_{it} \quad (5)$$

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \beta_{iu}UMD_t + \varepsilon_{it} \quad (6)$$

where,

R_{it} is the return of firm i for month t.

R_{ft} is the risk-free rate (1-month Treasury-bill rate).

$(R_{Mt} - R_{ft})$ is the excess return on the market portfolio (CSRP value-weighted index) for month t.

SMB_t is the difference between the returns on portfolios of "small" and "big" capitalization stocks for month t.

HML_t is the difference between the returns on portfolios of "high" and "low" book-to-market stocks for month t.

UMD_t is the difference between the returns on portfolios of high and low prior return (months -12 to – 2) stocks.

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[27] It can also be measured monthly using the daily stock returns during the previous month times the square root of the number of days with returns.

[28] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

ε_{it} is the stochastic error term, assumed to be IID normal with mean zero and constant variance $\sigma^2_{\varepsilon_i}$.[29]

Systematic risk (market beta) is estimated using the standard CAPM, and the four-factor Carhart (1997) model using the previous five years of monthly excess returns for each-firm-year observation. Idiosyncratic (unsystematic) risk is measured as the standard deviation of the residuals from the standard CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model using the previous year daily excess returns.

1.4.3. Relation between firm risk and social performance

1.4.3.1. Multivariate framework

To examine the effect of social performance (SP) on a firm's risk, we run the following regression:

$$Risk_{it} = \alpha_0 + \alpha_1 SP_{it-1} + \delta X_{it-1} + \varepsilon_{it} \quad (7)$$

$$Risk_{it} = \alpha_0 + \alpha_{11} Str_{it-1} + \alpha_{12} Con_{it-1} + \delta X_{it-1} + \varepsilon_{it} \quad (8)$$

where $Risk_{it}$ and SP_{it} are the risk and the social performance measure for firm i at time t, respectively. X_{it} is a vector of firm-specific characteristics, industry factors, and economic or market-wide factors that affect a firm's risk. δ is the vector of the related regression coefficients. The coefficient α_1 reveals whether there is a relationship between the aggregate SP measure and the firm's risk measure. According to our first hypothesis, α_1 is expected to be negative and significant. Similarly, α_{11} (α_{12}) is expected to be negative (positive) and significant according to our second (third) hypothesis. Our fourth hypothesis suggests that α_{11} will be lower than α_{12}.

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[29] The market model has been used by several studies to compute idiosyncratic risk (e.g., Malkiel and Xu, 1997; Boutin-Dufresne and Savaria, 2004; Lee and Faff, 2009).

To estimate equation (7), we use pooled cross-section time-series regressions and control for industry and year fixed effects. Since a firm's risk varies by industry (Fama and French, 1997; Gebhardt *et al.*, 2001), we include industry dummy variables in our regressions to control for industry fixed effects. We also include year dummy variables to control for the effects of the changing economic conditions on a firm's risk. Standard errors are adjusted for both heteroskedasticity and clustering of observations.

1.4.3.2. Determinants of firm risk

Previous studies find that a firm's risk can be affected by firm-specific characteristics, industry factors, and economic or market-wide factors.

- **Firm size** (-): Theoretical arguments as well as empirical evidence suggest that firm risk should be negatively related to firm size and positively related to the book-to-market (B/M) ratio.[30] Firm size is proxied by the logarithm of the market value of common equity at the most recent fiscal year end prior to the measurement date of our risk measures to account for the highly skewed nature of this variable.[31]

- **Book-to-Market (B/M) ratio** (+): The firm's risk is expected to be positively related to the book-to-market ratio,[32] which is computed as the ratio of the book to market value of common equity as of the most recent fiscal year end.

- **Financial leverage** (+): The firm's risk is expected to be positively related to a firm's financial leverage (Botosan and Plumlee, 2005; Witmer and Zorn, 2007; Lee *et al.*, 2009). We use a net leverage measure (Bates *et al.*, 2009), which is measured as the ratio of long-term debt minus cash & marketable securities to the market value of common equity using values for the most recent fiscal year end.

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[30] Fama and French (1992, 1993); Berk *et al.* (1999); Carlson *et al.* (2004, 2006); Gebhardt *et al.* (2001); Botosan and Plumlee (2005); Gode and Mohanram (2003); Hail and Leuz (2006); Lee, *et al.* (2009).

[31] Firm size can also be proxied by the logarithm of the firm's total assets.

[32] Gode and Mohanram (2003) argue that high B/M could reflect lower growth opportunities, lower accounting conservatism, or high perceived risk.

- **Expected return (+)**: The firm's expected return is expected to be positively related to stock return volatility and the firm's beta (Gordon and Gordon, 1997; Gode and Mohanram, 2003; Botosan and Plumlee, 2005; Hail and Leuz, 2006; Lee *et al.*, 2009)[33] as well as to the firm's idiosyncratic risk (Malkiel and Xu, 1997; Lee and Faff, 2009). We use the annualized return from the previous year's daily stock returns to proxy for expected return.

- **Stock liquidity** (-): We expect firm risk to be negatively related to its stock liquidity (both liquidity level and risk) given the evidence that liquidity impacts stock returns. Brennan *et al.* (1998) find a negative relation between average returns and average dollar trading volume. Chordia *et al.* (2001) find a negative cross-sectional relation between average returns and both the level as well as the variability of liquidity, after controlling for size, book-to-market ratio, and momentum. The level of liquidity is proxied by the average daily share turnover, and the liquidity risk is proxied by the coefficient of variation of this measure over the previous year. Share turnover is defined as daily shares traded divided by daily shares outstanding.

- **Dispersion of analyst forecasts** (+): We expect a positive relation between the dispersion of analyst forecasts and the firm's risk because a higher dispersion in earnings forecasts implies greater disagreement between analysts about forecasted earnings. Such dispersion should capture fundamental cash flow risk (Gebhardt *et al.*, 2001), and is measured by the cross-sectional standard deviation of either one-year-ahead earnings forecasts or long-term growth in earnings forecasts. We also use the **standard deviation of the return on assets (ROA)** to control for cash flow risk. The standard deviation of ROA, which is expected to be positively related to the firm's risk, is measured over the five previous years up to the fiscal-year end date of each firm-year observation.

- **Investment-to-asset ratio** (-): The firm's risk is expected to be negatively related to the investment-to-assets ratio. The *q*-theory of investment (e.g., Cochrane, 1991; Liu *et al.*,

[33] The empirical evidence regarding the relation between the market beta and the expected return (proxied by the implied cost of equity) is mixed. For example, Gordon and Gordon (1997) and Gode and Mohanram (2003) find a positive relation, whereas Gebhardt *et al.* (2001) find no significant relation after controlling for the previous year's average industry risk premium.

2007) and the real options theory (e.g., Berk *et al.,* 1999; Carlson *et al.,* 2004, 2006) predict a negative relation between investment and risk. It follows that firms having higher investment-to-assets ratios should have lower risks than firms having lower investment-to-assets ratios. We use three proxies for investment: capital expenditures divided by total assets, R&D expenditures divided by total assets, and advertising expenses divided by total assets. We also group these three variables into a single variable computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets.

- **Expected growth in earnings** (+): The firm's risk is expected to be positively related to the firm's expected long-term growth in earnings. We use the mean annualized five-year earnings growth rate from I/B/E/S (where available, otherwise estimated as the implicit growth in forecasted earnings from year 1 to year 2) to proxy for expected growth in earnings.

- **Default risk** (+): Default risk (or distress risk) is expected to be positively related to the firm's risk. Altman's (1993) Zscore is used as a proxy for distress risk:

$$Zscore = 1.2 \times \left(\frac{NWC}{TA}\right) + 1.4 \times \left(\frac{RE}{TA}\right) + 3.3 \times \left(\frac{EBIT}{TA}\right) + \left(\frac{Sales}{TA}\right) + 0.6 \times \left(\frac{MVEquity}{BVTL}\right)$$

where, NWC is net working capital (current assets – current liabilities), RE is retained earnings, EBIT is earnings before interest and taxes, MVEquity is the market value of total equity (common and preferred stocks), BVTL is total liabilities (current and long term liabilities), and TA is total assets. A higher value of the Zscore indicates a lower likelihood of default.

- **The size of investor base (-)**: The firm's risk is expected to be negatively related to the size of its investor base (Merton, 1987), which is measured as the number of common ordinary shareholders divided by common shares outstanding.

- **Industry factors**: The firm's risk should vary by industry (Gebhardt *et al.*, 2001; Gode and Mohanram, 2003). To control for industry effects on the firm's risk, we include

industry dummy variables in our analysis (i.e., industry-fixed effects) by annually grouping firms according to the industry classification in Fama and French (1997).

- **Market-wide factors**: We include dummy variables for each year in our sample period (i.e., year-fixed effects) to control for changing economic conditions or the market-wide effects on the firm's risk.

1.5. Empirical results

1.5.1. Descriptive statistics[34]

Panel A of Table 1.1 shows that the mean (median) values of the aggregate measure of social performance SP which combines strengths and concerns are negative (-0.019 and -0.015, respectively) suggesting that concerns are, on average, slightly higher than strengths. Aggregate measures of SP show similar patterns when computed with or without exclusionary screens.

[34] Except for the social performance measures and dummy variables, the variables are winsorized at the 1st and 99th percentiles to ensure that our results are not driven by outliers.

Table 1.1: Descriptive statistics of the KLD scores, the risk measures and the explanatory variables during 1991-2007

	Mean	Median	Standard deviation	Min	Max	Skewness	Kurtosis	N
Panel A: SP measures								
SP	-0.0190	-0.0153	0.0436	-0.2782	0.1993	-0.8169	5.6643	16599
SPwe	-0.0238	-0.0226	0.0662	-0.3952	0.3416	-0.1834	5.0049	16599
Str	0.0367	0.0238	0.0497	0	0.4923	2.3021	10.5101	16599
Con	0.0389	0.0263	0.0414	0	0.3542	2.0604	9.1544	16599
Conwe	0.0599	0.0476	0.0598	0	0.4870	1.8958	8.7394	16599
Panel B: Risk measures								
mbetaw	1.2748	1.0843	0.8729	-0.1475	4.4211	1.2991	4.9513	16388
mbetaffw	1.1196	1.0523	0.7263	-0.7514	3.6238	0.6667	4.5745	16388
Volatilityw	0.4560	0.3844	0.2399	0.1619	1.3461	1.4957	5.2280	16388
dvolatilityw	0.3948	0.3634	0.1626	0.1559	1.0074	1.2488	4.9524	16599
sdresCAPMw	0.3583	0.3291	0.1502	0.1225	0.8954	1.1885	4.6010	16599
sdresffw	0.3494	0.3198	0.1466	0.1186	0.8770	1.2182	4.6883	16599
sdres4ffw	0.3465	0.3171	0.1452	0.1175	0.8665	1.2064	4.6326	16599
Panel C: Independent variables								
displtg	0.0414	0.03	0.0431	0	1.3767	5.8707	99.3556	12873
dispeps1w	0.0989	0.05	0.1494	0	0.95	3.4978	17.1763	15786
expgrthw	0.1670	0.149	0.1254	0	1	4.0535	24.9629	16005
ret1y	0.1417	0.1476	0.3941	-3.3449	3.1327	-0.1715	6.7806	16599
avgturnover	0.0090	0.0066	0.0084	0.0001	0.2395	4.2402	55.8628	16599
sdturnover	0.0076	0.0050	0.0093	0.0001	0.2765	6.6371	105.574	16599
cvturnover	0.8305	0.7349	0.3986	0.2497	6.6507	2.7636	18.4260	16599
illiq * 10^{-5}	0.0018	0.0001	0.0312	0.0000	1.9	47.502	2535.504	16599
lnmkteq	7.5017	7.3430	1.5195	2.2042	13.138	0.5395	3.1283	16560
bmw	0.4220	0.3700	0.2856	-0.2191	1.4962	1.0736	5.0105	16557
rd	0.0622	0.0306	0.0915	0	1.3728	3.7970	26.6239	10687
ad	0.0390	0.0183	0.0602	0	0.8193	4.1846	29.5392	6723
capxs	0.0592	0.0425	0.0584	0	0.8127	2.9815	17.7648	16478
investment	0.1147	0.0905	0.0988	0	1.4997	2.7117	16.9704	16587
zscorew	5.0082	3.5327	6.3789	-78.2983	74.864	3.6449	36.6590	16599
netlevw	0.1126	0.1274	0.2657	-0.8314	2.5924	0.2576	6.2562	16587
leveragew	0.3049	0.1235	0.6991	0	11.424	8.5493	109.0316	16503
sdroa5yw	0.0531	0.0302	0.0669	0.0011	0.4073	3.1278	14.3874	16582
inv_basew	0.1543	0.0651	0.2232	0.0007	1.2308	2.4973	10.1131	16245

Notes:

This table presents the descriptive statistics of the social performance measures (panel A), the risk measures (Panel B), and the explanatory variables (Panel C) for the 16,599 firm-year sample observations between 1991 and 2007.

SP and SPwe are aggregate (composite) measures of social performance, which combine strengths and concerns, computed with and without exclusionary screens, respectively. Str (Con) is the aggregate measure of strengths (concerns). Conwe is Con computed without exclusionary screens. Systematic risk (mbetaw and mbetaffw) is the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Firm's total risk (Volatilityw and dvolatilityw) is

the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively.

Dispersion of analyst forecasts is measured by the cross-sectional standard deviation of either one-year-ahead earnings forecasts (dispeps1w) or long-term growth in earnings forecasts (displtg). Expected growth in earnings (expgrthw) is the mean annualized five-year earnings growth rate from I/B/E/S (where available, otherwise estimated as the implicit growth in forecasted earnings from year 1 to year 2). ret1y is the annualized return from the previous year's daily stock returns. The level of liquidity is proxied by the average daily share turnover (avgturnover), and the liquidity risk is proxied by the standard deviation (sdturnover) or the coefficient of variation (cvturnover) of this measure over the previous year. Share turnover is defined as daily shares traded divided by daily shares outstanding. The Amihud illiquidity measure (illiq) is computed as in Amihud (2002).

Firm size (lnmkteq) is proxied by the logarithm of the market value of common equity at the most recent fiscal year-end. Book-to-market ratio (bmw) is computed as the ratio of the book to market value of common equity as of the most recent fiscal year end. Capxs is capital expenditures divided by total assets, rd is R&D expenditures divided by total assets, and ad is advertising expenses divided by total assets. Investment is computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets. Net leverage (netlevw) is measured as the ratio of long-term debt minus cash & marketable securities to the market value of common equity using values for the most recent fiscal year end. Distress risk (zscorew) is computed as:

$$Zscore = 1.2 \times \left(\frac{NWC}{TA}\right) + 1.4 \times \left(\frac{RE}{TA}\right) + 3.3 \times \left(\frac{EBIT}{TA}\right) + \left(\frac{Sales}{TA}\right) + 0.6 \times \left(\frac{MVEquity}{BVTL}\right)$$

where, NWC is net working capital (current assets – current liabilities), RE is retained earnings, EBIT is earnings before interest and taxes, MVEquity is the market value of total equity (common and preferred stocks), BVTL is total liabilities (current and long term liabilities), and TA is total assets. The standard deviation of return on assets (sdroa5yw) is computed over the five previous years up to the fiscal-year end date of each firm-year observation. The size of investor base (inv_basew) is measured as the number of common ordinary shareholders divided by common shares outstanding. Except for the social performance measures and dummy variables, the variables are winsorized (w) at the 1st and 99th percentiles.

This observation is confirmed when the combined measure is split into two aggregate measures of strengths and concerns. The mean (median) strengths score Str of 0.036 (0.023) is smaller than the mean (median) concerns score Con of 0.038 (0.026) when computed with exclusionary screens. The difference is statistically significant at the 1% level with t-statistic of -5.12 for means and z-statistic of -11.48 for medians.[35] The mean (median) strengths score is also smaller than the mean (median) concerns score of 0.059 (0.047) when computed

[35] We used the paired t-test (the wilcoxon signed rank test) for the comparisons of the means (medians).

without exclusionary screens (Conwe). The difference is statistically significant at the 1% level with t-statistic of -44.73 for means and z-statistic of -45.71 for medians.

Based on Panel B of Table 1.1, the mean (median) systematic risk is 1.27 (1.08) using the CAPM and 1.12 (1.05) using the four-factor model. The mean (median) total risk is 0.45 (0.38) using five-year monthly returns and 0.39 (0.36) using one-year daily returns. The mean (median) idiosyncratic risk is 0.35 (0.32) using the CAPM. Using the three- or four-factor models yield similar results. Panel C of Table 1.1 reports descriptive statistics for our explanatory variables.

Table 1.2 reports that the aggregate measures of social performance (SP and SPwe), which combine strengths and concerns and are computed with and without exclusionary screens, are highly positively correlated. These aggregate measures of social performance have positive correlations with the strengths score Str, ranging from 0.38 to 0.49, and negative correlations with concerns scores Con and Conwe, ranging from -0.59 to -0.79. The correlations between strengths and concerns are positive but relatively low, which supports the notion that they are different concepts and should be treated separately in empirical work. The correlation between Str and Con (Conwe) is 0.24 (0.26).

Table 1.2: Correlation coefficients among the risk measures and social performance measures during 1991-2007

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SP	**(1)**	1.0000											
SPwe	**(2)**	0.8772*	1.0000										
Str	**(3)**	0.3872*	0.4958*	1.0000									
Con	**(4)**	-0.7998*	-0.5999*	0.2428*	1.0000								
Conwe	**(5)**	-0.6558*	-0.7028*	0.2678*	0.8645*	1.0000							
mbetaw	**(6)**	0.0277	-0.0151	-0.0930*	-0.0907*	-0.0591*	1.0000						
mbetaffw	**(7)**	-0.0100	-0.0253	-0.0451*	-0.0195	-0.0094	0.7068*	1.0000					
Volatilityw	**(8)**	0.0313*	-0.0239	-0.2056*	-0.1684*	-0.1378*	0.6737*	0.3724*	1.0000				
dvolatilityw	**(9)**	0.0725*	0.0247	-0.1407*	-0.1688*	-0.1382*	0.4494*	0.2524*	0.6435*	1.0000			
sdresCAPMw	**(10)**	0.0802*	0.0307*	-0.1471*	-0.1810*	-0.1510*	0.4196*	0.2269*	0.6313*	0.9832*	1.0000		
sdresffw	**(11)**	0.0820*	0.0340*	-0.1450*	-0.1814*	-0.1531*	0.4115*	0.2201*	0.6255*	0.9783*	0.9980*	1.0000	
sdres4ffw	**(12)**	0.0838*	0.0364*	-0.1462*	-0.1841*	-0.1567*	0.4103*	0.2179*	0.6262*	0.9742*	0.9963*	0.9992*	1.0000

Note:

This table presents the correlation coefficients between the risk and social performance measures for the 16,599 firm-year sample observations between 1991 and 2007. SP and SPwe are aggregate (composite) measures of social performance, which combine strengths and concerns, computed with and without exclusionary screens, respectively. Str (Con) is the aggregate measure of strengths (concerns). Conwe is Con computed without exclusionary screens. Systematic risk (mbetaw and mbetaffw) is the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively.

* Statistical significance at the 1% level ($p < 0.01$).

Table 1.2 also shows positive correlations between all risk measures. The correlations range from 0.21 to 0.99. Based on Table 1.2, all risk measures are negatively correlated with the strengths and concerns measures. However, the aggregate social performance measure computed with exclusionary screens is positively correlated with total risk and idiosyncratic risk. The aggregate social performance measure computed without exclusionary screens is positively correlated only with idiosyncratic risk. Based on Table 1.3, only a few of the explanatory variables are highly correlated. For example, the correlation coefficient between the average and standard deviation of share turnover is 0.82. Except these special cases, the correlation coefficients are relatively low overall, which mitigate the multicollinearity concerns that could affect the regression results.

Table 1.3: Correlation coefficients among the explanatory variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
displtg	**(1)**	1.0000																	
dispeps1w	**(2)**	0.0742*	1.0000																
expgrthw	**(3)**	0.4429*	-0.0835*	1.0000															
ret1y	**(4)**	0.0189	-0.0928*	0.0417*	1.0000														
avgturnover	**(5)**	0.2638*	0.1489*	0.1855*	-0.0270	1.0000													
sdturnover	**(6)**	0.2181*	0.1031*	0.1945*	-0.0470*	0.8276*	1.0000												
cvturnover	**(7)**	0.0270	0.0029	0.1277*	-0.0431*	0.0513*	0.4273*	1.0000											
illiq	**(8)**	-0.0088	-0.0077	0.0088	0.0323*	-0.0399*	-0.0138	0.1776*	1.0000										
lnmkteq	**(9)**	-0.0806*	0.0007	-0.1828*	0.0806*	-0.0865*	-0.2233*	-0.4753*	-0.1164*	1.0000									
bmw	**(10)**	-0.0065	0.1526*	-0.0978*	-0.1737*	-0.0727*	-0.0636*	0.0519*	0.0700*	-0.2981*	1.0000								
rd	**(11)**	0.2264*	0.1145*	0.2004*	-0.0783*	0.2012*	0.2672*	0.2129*	-0.0023	-0.1994*	-0.2212*	1.0000							
ad	**(12)**	-0.0995*	-0.0781*	-0.0444	-0.0127	-0.0272	0.0187	0.0325	-0.0072	-0.0027	-0.1192*	-0.1296*	1.0000						
capxs	**(13)**	0.0416*	0.1336*	0.0191	-0.0049	0.0094	-0.0319*	-0.0759*	0.0294	0.0590*	-0.0365*	-0.1469*	0.0746*	1.0000					
investment	**(14)**	0.0977*	0.0606*	0.1177*	-0.0649*	0.1724*	0.2013*	0.0940*	0.0185	-0.0720*	-0.2231*	0.7938*	0.6065*	0.4806*	1.0000				
zscorew	**(15)**	0.0367*	-0.1443*	0.1740*	0.1058*	0.1505*	0.1244*	0.0231	-0.0043	0.0322*	-0.2291*	0.0508*	0.0725*	-0.0256	0.0787*	1.0000			
netlevw	**(16)**	-0.0929*	0.1438*	-0.1726*	-0.0544*	-0.1759*	-0.1761*	-0.0888*	-0.0096	0.1529*	0.0362*	-0.3056*	-0.0332	0.1299*	-0.1863*	-0.4332*	1.0000		
sdroa5yw	**(17)**	0.2661*	0.0995*	0.2310*	-0.0564*	0.3295*	0.3573*	0.2043*	0.0034	-0.2724*	-0.1511*	0.5021*	0.0355	-0.0399*	0.3684*	0.1197*	-0.3213*	1.0000	
inv_basew	**(18)**	-0.0823*	0.0575*	-0.1240*	0.0196	-0.1313*	-0.1049*	-0.0339*	0.0189	0.0736*	0.0510*	-0.1046*	0.0425	0.0646*	-0.0201	-0.0506*	0.0730*	-0.1160*	1.0000

Note:

This table presents the correlation coefficients among the explanatory variables for the 16,599 firm-year sample observations between 1991 and 2007. The explanatory variables include: the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w), the cross-sectional standard deviation of long-term growth in earnings forecasts (displtg), expected growth in earnings (expgrthw), the annualized return from the previous year's daily stock returns (ret1y), the average daily share turnover (avgturnover), the standard deviation (the coefficient of variation) of daily share turnover over the previous year (sdturnover (cvturnover)), the Amihud illiquidity measure (illiq) computed as in Amihud (2002), firm size (lnmkteq), the book-to-market ratio (bmw), capital expenditures divided by total assets (Capxs), R&D expenditures divided by total assets (rd), advertising expenses divided by total assets (ad), Investment computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets (investment), the distress risk measure (zscorew), the net leverage (netlevw), the standard deviation of return on assets (sdroa5yw), and the size of investor base (inv_basew). All variables are defined in footnotes of Table 1.1.

* Statistical significance at the 1% level ($p < 0.01$).

1.5.2. Relation between Firm Risk and Social Performance

Panel A of Table 1.4 reports the results of the regressions between total risk and social performance.[36] The aggregate SP measure is significantly and negatively related to stock return volatility. The coefficient associated with SP is -0.096 when total risk is computed using five-year monthly returns and -0.063 when total risk is computed using one-year daily returns. At first glance, all else equal, volatility would decrease with higher aggregate SP. However, when we substitute the aggregate measures of strengths Str and concerns Con for the aggregate SP, we observe positive and statistically significant (1% level) coefficients for both measures regardless of the risk metric used. Moreover, the magnitude and statistical significance of the coefficients associated with the aggregate measure of concerns (0.22 and 0.17) are higher than those of the coefficients associated with the aggregate strengths measure (0.092 and 0.096). The difference is statistically significant at the 5% level. The p-values of the one-sided Wald tests are 0.025 and 0.035, respectively. The mere netting involved in the aggregate SP (i.e., strengths net of concerns) and the fact that concerns display positive coefficients twice as large as strengths could explain the observed negative link between volatility and the aggregate SP.

[36] All our reported results include SP measure computed with exclusionary screens. If their exclusion modifies the results, we mention that explicitly.

Table 1.4: Relation between the risk measures and social performance

	Panel A: Total risk measures				Panel B: Idiosyncratic risk measures						Panel C: Systematic risk measures			
	Volatilityw	Volatilityw	dvolatilityw	dvolatilityw	sdresCAPMw	sdresCAPMw	sdresffw	sdresffw	sdres4ffw	sdres4ffw	mbetaw	mbetaw	mbetaffw	mbetaffw
SP	-0.0960**		-0.0630**		-0.0613**		-0.0621**		-0.0637**		0.0954		0.0473	
	(-2.19)		(-2.10)		(-2.30)		(-2.39)		(-2.47)		(0.45)		(0.24)	
Str		0.0926***		0.0968***		0.1078***		0.1090***		0.1111***		0.2012		0.0761
		(2.75)		(3.63)		(4.57)		(4.76)		(4.91)		(1.16)		(0.47)
Con		0.2227***		0.1788***		0.1855***		0.1877***		0.1918***		0.0276		-0.0103
		(4.17)		(5.52)		(6.35)		(6.59)		(6.80)		(0.11)		(-0.04)
lnmkteq	-0.0403***	-0.0444***	-0.0279***	-0.0315***	-0.0288***	-0.0328***	-0.0278***	-0.0317***	-0.0279***	-0.0320***	-0.0563***	-0.0604***	-0.0250***	-0.0263***
	(-22.65)	(-21.56)	(-21.66)	(-21.90)	(-24.42)	(-24.95)	(-24.02)	(-24.66)	(-24.26)	(-25.02)	(-6.79)	(-6.27)	(-3.43)	(-3.07)
bmw	-0.0338***	-0.0374***	0.0052	0.0019	0.0050	0.0015	0.0031	-0.0005	0.0021	-0.0016	-0.0489	-0.0525	-0.0008	-0.0020
	(-3.90)	(-4.27)	(0.83)	(0.30)	(0.87)	(0.26)	(0.54)	(-0.09)	(0.37)	(-0.28)	(-1.25)	(-1.33)	(-0.02)	(-0.05)
netlevw	-0.0159	-0.0152	-0.0041	-0.0035	-0.0020	-0.0013	-0.0023	-0.0016	-0.0025	-0.0018	-0.1311**	-0.1303**	-0.0162	-0.0159
	(-1.45)	(-1.39)	(-0.59)	(-0.50)	(-0.32)	(-0.21)	(-0.37)	(-0.27)	(-0.40)	(-0.29)	(-2.51)	(-2.50)	(-0.35)	(-0.34)
ret1y	0.0167***	0.0175***	-0.0038	-0.0030	-0.0055*	-0.0047	-0.0064**	-0.0056*	-0.0062**	-0.0053*	-0.0051	-0.0042	0.0935***	0.0938***
	(4.21)	(4.43)	(-1.14)	(-0.91)	(-1.84)	(-1.57)	(-2.17)	(-1.89)	(-2.10)	(-1.82)	(-0.28)	(-0.23)	(4.94)	(4.94)
avgturnover	7.7454***	7.8338***	6.1006***	6.1767***	5.3857***	5.4676***	5.1739***	5.2568***	5.0082***	5.0928***	26.3371***	26.4272***	15.1975***	15.2273***
	(22.41)	(22.57)	(21.27)	(21.33)	(21.06)	(21.13)	(20.42)	(20.51)	(19.78)	(19.87)	(15.61)	(15.59)	(9.51)	(9.48)
cvturnover	0.0011	-0.0006	0.0619***	0.0604***	0.0754***	0.0738***	0.0790***	0.0775***	0.0803***	0.0787***	-0.1471***	-0.1488***	-0.1445***	-0.1450***
	(0.22)	(-0.12)	(11.70)	(11.55)	(14.23)	(14.04)	(14.80)	(14.60)	(14.97)	(14.77)	(-6.71)	(-6.76)	(-6.96)	(-6.96)
dispeps1w	-0.0023	-0.0056	0.0538***	0.0508***	0.0494***	0.0462***	0.0472***	0.0440***	0.0442***	0.0410***	-0.0065	-0.0098	0.1938***	0.1928***
	(-0.16)	(-0.41)	(4.84)	(4.63)	(4.90)	(4.63)	(4.76)	(4.48)	(4.50)	(4.21)	(-0.09)	(-0.14)	(2.64)	(2.64)
investment	0.1128***	0.1104***	0.1094***	0.1074***	0.1002***	0.0980***	0.0954***	0.0931***	0.0938***	0.0915***	0.2471*	0.2443*	0.0957	0.0947
	(4.11)	(4.04)	(6.58)	(6.48)	(6.84)	(6.73)	(6.67)	(6.56)	(6.63)	(6.51)	(1.90)	(1.88)	(0.72)	(0.71)
expgrthw	0.1796***	0.1804***	0.1411***	0.1419***	0.1207***	0.1215***	0.1144***	0.1152***	0.1123***	0.1132***	0.6816***	0.6824***	0.3842***	0.3845***
	(9.32)	(9.37)	(12.24)	(12.35)	(11.34)	(11.49)	(10.99)	(11.14)	(10.92)	(11.08)	(8.07)	(8.08)	(5.07)	(5.07)
zscorew	-0.0020***	-0.0020***	-0.0001	-0.0000	-0.0003	-0.0002	-0.0004	-0.0003	-0.0003	-0.0002	-0.0123***	-0.0123***	-0.0111***	-0.0110***
	(-4.64)	(-4.46)	(-0.31)	(-0.03)	(-1.43)	(-1.05)	(-1.57)	(-1.17)	(-1.48)	(-1.07)	(-5.46)	(-5.42)	(-4.94)	(-4.91)
sdroa5yw	0.9489***	0.9396***	0.4300***	0.4217***	0.4098***	0.4009***	0.3984***	0.3894***	0.3919***	0.3827***	3.1796***	3.1705***	1.2005***	1.1976***
	(18.80)	(18.64)	(15.34)	(15.06)	(16.56)	(16.25)	(16.50)	(16.18)	(16.46)	(16.14)	(13.70)	(13.65)	(4.87)	(4.85)
inv_basew	-0.0478***	-0.0522***	-0.0306***	-0.0346***	-0.0244***	-0.0287***	-0.0237***	-0.0280***	-0.0230***	-0.0274***	-0.2704***	-0.2749***	-0.1353***	-0.1367***
	(-5.14)	(-5.65)	(-5.36)	(-6.27)	(-4.68)	(-5.69)	(-4.67)	(-5.70)	(-4.58)	(-5.64)	(-6.35)	(-6.40)	(-3.40)	(-3.41)
Constant	0.5408***	0.5647***	0.4119***	0.4334***	0.4059***	0.4290***	0.3957***	0.4191***	0.3970***	0.4208***	1.4350***	1.4589***	1.1242***	1.1319***
	(18.61)	(20.02)	(16.76)	(19.42)	(18.54)	(21.89)	(17.89)	(21.23)	(17.81)	(21.25)	(11.48)	(11.46)	(8.84)	(8.69)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14800	14800	14970	14970	14970	14970	14970	14970	14970	14970	14800	14800	14800	14800
Number of firms	2749	2749	2796	2796	2796	2796	2796	2796	2796	2796	2749	2749	2749	2749
R-squared	0.650	0.651	0.634	0.636	0.640	0.643	0.637	0.640	0.636	0.639	0.415	0.415	0.169	0.169

Note:

Table 1.4 reports results from OLS regressions of the risk measures on the social performance measures and controls over the period 1991–2007. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Systematic risk (mbetaw and mbetaffw) is the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). The explanatory variables include: firm size (lnmkteq), the book-to-market ratio (bmw), the net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the average daily share turnover (avgturnover), the coefficient of variation of daily share turnover over the previous year (cvturnover), the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w), Investment computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets (investment), expected growth in earnings (expgrthw), the distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and the size of investor base (inv_basew). All variables are defined in footnotes of Table 1.1. Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

The results reported in Panel A of Table 1.4 have three implications. First, the social performance in aggregate is negatively related to total risk which supports our first hypothesis. Second, both higher concerns scores and higher strengths scores increase total risk. This finding supports our third hypothesis for the concerns, but not the second hypothesis for the strengths. Third, the relation between the concerns measure and total risk is stronger than the relation between the strengths measure and total risk. The latter finding supports our fourth hypothesis.

Panel B of Table 1.4 shows that aggregate measure SP is significantly and negatively related to idiosyncratic risk regardless of how it is measured. The coefficients associated with the aggregate measures of strengths Str and concerns Con are positive and statistically significant regardless of the risk metric used. Similar to the results for total risk, the magnitude and statistical significance of the coefficients associated with the aggregate measure of concerns (0.185, 0.187 and 0.191) are higher than those of the coefficients associated with the aggregate strengths measure (0.107, 0.109 and 0.111). The differences are

statistically significant at the 5% level. The p-values of the one-sided Wald tests are 0.027, 0.022 and 0.018, respectively.

Overall, the results for idiosyncratic risk are similar to those for total risk. Social performance in aggregate is negatively related to idiosyncratic risk which supports our first hypothesis. Both higher concerns scores and higher strengths scores increase idiosyncratic risk, which supports our third hypothesis for the concerns, but not the second hypothesis for the strengths. Finally, the relation between the concerns measure and idiosyncratic risk is stronger than the relation between the strengths measure and idiosyncratic risk which supports our fourth hypothesis.

Panel C of Table 1.4 reports the results of the regressions between systematic risk and social performance. None of the coefficients associated with the aggregate measure of SP or the two aggregate measures of strengths Str and concerns Con are significant.[37] Overall, these results do not support our hypotheses that social performance in aggregate or their strengths or concerns components are related to systematic risk.

In summary, the results reported in Table 1.4 suggest that both aggregate measures of strengths and concerns increase total risk mainly due to idiosyncratic risk. Moreover, the risk increase associated with strengths is lower than that associated with concerns, which suggests an asymmetric relation between social performance and firm risk.

[37] When computed without exclusionary screens, the coefficient associated with the aggregate measure of SP is negative and marginally significant (10% level), whereas the coefficient associated with the aggregate measure of concerns Conwe is positive and significant (1% level) when the dependent variable is the systematic risk computed from the CAPM (result not reported). The latter finding is consistent with the results of Oikonomou *et al.* (2012) who examine this relation for S&P 500 firms (including utilities and financial firms unlike conventional practice).

1.6. Robustness checks

1.6.1. Reverse causality: Social performance as a function of risk

Our regression equations (7&8) were estimated with the risk measures as the dependent variables and the SP measures as the independent variables plus a set of control variables. This econometric specification implies that SP causes a firm's risk because risk is the dependent variable in the regression equation. However, there exist theoretical justifications for the proposition that financial performance causes SP (e.g., slack resources hypothesis). In our context, this implies that a firm's risk may in turn affect its SP in several ways. That is, a firm's risk causes SP. For example, largest firms with rather stable cash flows can afford to initiate social actions. Cash flow stability implies less stock price volatility. All else equal, lower cash flow volatility and enduring profitability are prerequisites for social commitment according to the slack resources hypothesis. It is also possible that managers of less risky firms may be less prone to improve their SP due to lower stakeholders' pressure. Alternatively, managers of risky firms may improve SP in an attempt to change the perceptions of investors and analysts about the risk profile of their firms.

The argument is that we should be aware of the two empirical issues implied by the relationship between a firm's risk and SP: what is the sign of the relationship (positive, negative or neutral)? What is the direction of causation? In this section, we test the alternate proposition that a firm's risk causes SP.

Given the lack of a well developed *a priori* model of the determinants of SP (Simpson and Kohers, 2002), we rely on previous research and our judgement to propose an empirical model for SP. To examine the effect of a firm's risk on SP, we run the following regression:

$$SP_{it} = \gamma_0 + \gamma_1 Risk_{it-1} + \theta Y_{it-1} + \omega_{it} \qquad (9)$$

where, SP_{it} and $Risk_{it}$ are the SP and risk measures for firm i at time i, respectively. Y_{it} is a vector of firm-specific characteristics, industry factors, and market-wide factors that could affect SP. θ is the related vector of coefficients.

1.6.1.1. Cross-sectional determinants of SP

Previous empirical studies find that SP can be affected by several firm characteristics which include risk (e.g., beta and standard deviation of returns), firm size, leverage ratio, book-to-market ratio, capital expenditures, R&D expenditures, advertising expenses, and industry (Graves and Waddock, 1994; Waddock and Graves, 1997; McWilliams and Siegel, 2000; Hillman and Keim, 2001; Orlitzky and Benjamin, 2001; Margolis and Walsh, 2003; Orlitzky *et al.,* 2003; Mattingly and Berman, 2006; Barnea and Rubin, 2010; Mahoney and Roberts, 2007; Sharfman and Fernando, 2008; Harjoto and Jo, 2011). Moreover, recent studies find that SP is negatively related to the cost of equity capital (Feldman *et al.,* 1997; Sharfman and Fernando, 2008; El Ghoul *et al.,* 2011), and financial distress or default risk (Goss, 2007).

Based on theoretical arguments and the empirical evidence reported in previous studies, the firm-specific characteristics considered in the SP model used herein are firm size (lnmkteq), Book-to-Market ratio (bmw), net leverage (netlevw), the cost of equity capital (ICC), the level of stock liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment-to-asset ratio (investment), expected growth in earnings (expgrthw), default risk (zscorew), and investor base (inv_basew).[38]

We estimate the cost of equity capital using the implied cost of capital methodology (ICC approach hereafter). The main idea of the ICC approach is to treat each firm as an investment project and to use the valuation equation in order to back out the cost of equity. The cost of equity is the discount rate (or the internal rate of return) that equates the current stock price to the present value of all expected future cash flows. Investors' expectations are proxied by financial analyst forecasts, assuming that analysts' forecasts reflect or drive investors' beliefs. Several studies have used the ICC approach along with forecasted earnings to estimate the cost of equity at the firm-level (e.g., Claus and Thomas, 2001; Gebhardt *et al.* 2001; Easton, 2004; Ohlson and Juettner-Nauroth, 2005; Hail and Leuz, 2006; Witmer and Zorn, 2007; Lee *et al.,* 2009). The ICC approach using forecasted earnings is appealing because it provides an

[38] Harjoto and Jo (2011) show that analyst coverage is significantly related to SP. We do not include analyst coverage because it is highly correlated with firm size.

ex ante cost of equity measure. Most asset pricing theories are formulated in terms of *ex ante* predictions. By inferring the cost of equity from current price and expectations about the future, we can think of the cost of equity as a market-determined measure (Ohlson and Juettner-Nauroth, 2005). We follow this research stream by computing the cost of equity for each firm-year observation using five ICC models: PEG ratio model of Easton (2004), MPEG ratio model of Easton (2004), ICC model of Ohlson and Juettner (2005), ICC model of Claus and Thomas (2001), and ICC model of Lee *et al.* (2009). For each firm-year observation we compute the implied cost of equity using current stock price, book value per share, one-year-ahead and two-year-ahead mean earnings per share forecasts, payout ratio, five-year annualized mean (median) growth rate (an estimate for short-term growth obtained from I/B/E/S), and an estimate for the long-term growth rate (e.g., expected inflation rate). The implementation of the five ICC models is similar to that of Hail and Leuz (2006) and El Ghoul *et al.* (2011). We use the average implied cost of equity (ICC) based on the five models as our proxy for the cost of equity.

The variable investor base (inv_basew) is included to control for ownership structure following the empirical evidence reported in previous studies showing a significant relationship between SP and some measures of ownership structure such as institutional and insiders' ownership (e.g., Mahoney and Roberts, 2007; Barnea and Rubin, 2010; Harjoto and Jo, 2011). We expect this variable to be positively related to SP based on theoretical arguments (see e.g., Heinkel *et al.,* 2001; Mackey *et al.,* 2007).

Equation (9) is estimated using pooled cross-section time-series regressions. Because SP may vary by industry (Griffin and Mahon, 1997; Carroll, 1999; Simpson and Kohers, 2002), we include industry dummy variables using the Fama-French (FF) industry classification to control for industry fixed effects. We also include year dummies to control for changing economic conditions which could affect SP. We adjust the standard errors for both heteroskedasticity in the error terms and clustering of observations.

1.6.1.2. Empirical findings

Table 1.5 reports the results of the reverse causality regressions between the SP and the risk measures. Panel A shows that the coefficients associated with total and idiosyncratic risks are negative and statistically significant when the dependent variable is the aggregate SP measure. None of the coefficients associated with the systematic risk measures are significant. Similarly, Panel B and C of Table 1.5 show that the coefficients associated with total and idiosyncratic risks are positive and statistically significant when the dependent variable is either the aggregate measure of strengths Str or concerns Con. None of the coefficients associated with the systematic risk measures are significant when the dependent variable is either the aggregate measure of strengths Str or concerns Con. The only exception is the coefficient associated with the CAPM beta, which is positive and significant when the dependent variable is the aggregate measure of concerns Con.

Table 1.5: Reverse causality between the risk measures and social performance

	Panel A: AggregateSocial Performance measure						
	SP	SP	SP	SP	SP	SP	SP
Volatilityw	-0.010**						
	(-2.19)						
dvolatilityw		-0.012**					
		(-1.98)					
sdresCAPMw			-0.015**				
			(-2.26)				
sdresffw				-0.015**			
				(-2.31)			
sdres4ffw					-0.016**		
					(-2.43)		
mbetaw						0.001	
						(0.76)	
mbetaffw							-0.000
							(-0.25)
lnmkteq	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(-4.13)	(-4.08)	(-4.14)	(-4.15)	(-4.17)	(-3.88)	(-3.92)
bmw	-0.007**	-0.007**	-0.007**	-0.007**	-0.007**	-0.007**	-0.007**
	(-2.24)	(-2.23)	(-2.26)	(-2.27)	(-2.27)	(-2.13)	(-2.14)
netlevw	-0.010**	-0.011***	-0.011***	-0.011***	-0.011***	-0.010**	-0.010**
	(-2.50)	(-2.65)	(-2.65)	(-2.65)	(-2.66)	(-2.37)	(-2.43)
ICC	-0.050**	-0.048**	-0.048**	-0.048**	-0.048**	-0.051**	-0.050**
	(-2.51)	(-2.49)	(-2.46)	(-2.47)	(-2.46)	(-2.57)	(-2.54)
avgturnover	-0.055	-0.051	-0.048	-0.049	-0.047	-0.149	-0.125
	(-0.52)	(-0.48)	(-0.45)	(-0.47)	(-0.45)	(-1.43)	(-1.22)
cvturnover	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(1.18)	(1.23)	(1.35)	(1.38)	(1.41)	(1.25)	(1.18)
dispeps1w	-0.017***	-0.016***	-0.016***	-0.016***	-0.016***	-0.016***	-0.016***
	(-2.91)	(-2.79)	(-2.80)	(-2.81)	(-2.81)	(-2.77)	(-2.80)
investment	0.070***	0.069***	0.069***	0.069***	0.069***	0.069***	0.069***
	(6.42)	(6.43)	(6.43)	(6.43)	(6.43)	(6.31)	(6.33)
expgrthw	0.004	0.004	0.004	0.004	0.004	0.002	0.003
	(0.83)	(0.78)	(0.79)	(0.79)	(0.80)	(0.39)	(0.50)
zscorew	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(5.30)	(5.45)	(5.43)	(5.43)	(5.43)	(5.47)	(5.41)
sdroa5yw	-0.013	-0.014	-0.013	-0.013	-0.013	-0.025**	-0.023*
	(-0.97)	(-1.08)	(-1.00)	(-1.01)	(-0.98)	(-1.98)	(-1.80)
inv_basew	0.003	0.003	0.003	0.003	0.003	0.004	0.004
	(0.69)	(0.72)	(0.72)	(0.72)	(0.72)	(0.85)	(0.80)
Constant	0.012	0.014	0.016	0.016	0.016	0.005	0.006
	(0.65)	(0.77)	(0.86)	(0.87)	(0.90)	(0.31)	(0.36)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11785	11904	11904	11904	11904	11785	11785
Number of firms	2276	2312	2312	2312	2312	2276	2276
R-squared	0.236	0.235	0.235	0.235	0.235	0.235	0.235

Table 1.5: Reverse causality between risk measures and social performance (continued)

	Panel B: Aggregate Strengths measure							Panel C: Aggregate Concerns measure						
	Str	Str	Str	Str	Str	Str	Str	Con	Con	Con	Con	Con	Con	Con
Volatilityw	0.008*							0.034***						
	(1.95)							(6.06)						
dvolatilityw		0.029***							0.049***					
		(4.04)							(6.96)					
sdresCAPMw			0.035***							0.060***				
			(4.62)							(7.85)				
sdresffw				0.037***							0.062***			
				(4.79)							(7.98)			
sdres4ffw					0.038***							0.063***		
					(4.88)							(8.12)		
mbetaw						0.001							0.004***	
						(1.37)							(3.12)	
mbetaffw							-0.000							0.001
							(-0.16)							(0.88)
lnmkteq	0.018***	0.019***	0.019***	0.019***	0.019***	0.018***	0.018***	0.023***	0.023***	0.024***	0.024***	0.024***	0.022***	0.022***
	(13.12)	(13.29)	(13.38)	(13.40)	(13.41)	(13.22)	(13.22)	(17.85)	(17.67)	(17.79)	(17.84)	(17.85)	(17.53)	(17.48)
bmw	0.018***	0.018***	0.018***	0.018***	0.018***	0.017***	0.017***	0.028***	0.028***	0.028***	0.028***	0.028***	0.027***	0.027***
	(5.31)	(5.36)	(5.42)	(5.43)	(5.44)	(5.29)	(5.28)	(7.56)	(7.48)	(7.60)	(7.63)	(7.64)	(7.25)	(7.21)
netlevw	-0.009*	-0.008*	-0.008*	-0.008*	-0.008*	-0.009*	-0.009*	0.002	0.003	0.003	0.003	0.003	0.001	0.001
	(-1.86)	(-1.77)	(-1.76)	(-1.76)	(-1.76)	(-1.85)	(-1.93)	(0.37)	(0.59)	(0.60)	(0.59)	(0.60)	(0.29)	(0.14)
ICC	-0.004	-0.008	-0.009	-0.009	-0.009	-0.005	-0.004	0.086***	0.081***	0.079***	0.079***	0.079***	0.086***	0.087***
	(-0.20)	(-0.35)	(-0.41)	(-0.41)	(-0.41)	(-0.21)	(-0.17)	(3.04)	(3.00)	(2.93)	(2.94)	(2.94)	(3.08)	(3.14)
avgturnover	-0.730***	-0.797***	-0.806***	-0.806***	-0.805***	-0.703***	-0.663***	-0.484***	-0.501***	-0.516***	-0.509***	-0.507***	-0.322**	-0.240*
	(-5.47)	(-6.07)	(-6.18)	(-6.20)	(-6.20)	(-5.35)	(-5.17)	(-3.62)	(-3.78)	(-3.91)	(-3.86)	(-3.83)	(-2.45)	(-1.87)
cvturnover	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***	0.006***	0.006***	0.005***	0.005***	0.005***	0.006***	0.006***
	(5.55)	(5.53)	(5.40)	(5.36)	(5.33)	(5.64)	(5.55)	(3.24)	(3.08)	(2.77)	(2.67)	(2.62)	(3.40)	(3.26)
dispeps1w	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.040***	0.038***	0.038***	0.038***	0.038***	0.039***	0.038***
	(1.27)	(1.29)	(1.31)	(1.31)	(1.31)	(1.25)	(1.19)	(4.08)	(3.95)	(3.98)	(3.99)	(3.99)	(3.96)	(3.85)
investment	0.059***	0.057***	0.057***	0.057***	0.057***	0.060***	0.060***	-0.050***	-0.049***	-0.050***	-0.049***	-0.049***	-0.047***	-0.046***
	(4.76)	(4.70)	(4.68)	(4.69)	(4.69)	(4.80)	(4.82)	(-4.01)	(-4.04)	(-4.08)	(-4.06)	(-4.06)	(-3.78)	(-3.75)
expgrthw	-0.006	-0.008	-0.008	-0.008	-0.008	-0.005	-0.004	-0.020***	-0.020***	-0.020***	-0.020***	-0.020***	-0.016**	-0.014*
	(-0.95)	(-1.34)	(-1.36)	(-1.37)	(-1.37)	(-0.84)	(-0.69)	(-2.61)	(-2.62)	(-2.65)	(-2.64)	(-2.64)	(-2.12)	(-1.88)
zscorew	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-0.28)	(-0.31)	(-0.27)	(-0.26)	(-0.26)	(-0.28)	(-0.37)	(-5.65)	(-5.80)	(-5.74)	(-5.73)	(-5.73)	(-5.76)	(-5.87)
sdroa5yw	0.037**	0.029*	0.026*	0.026*	0.026*	0.042***	0.047***	0.073***	0.078***	0.073***	0.074***	0.073***	0.098***	0.109***
	(2.43)	(1.90)	(1.73)	(1.70)	(1.70)	(2.77)	(3.09)	(4.36)	(4.75)	(4.49)	(4.51)	(4.51)	(5.94)	(6.60)
inv_basew	0.025***	0.025***	0.025***	0.025***	0.025***	0.024***	0.024***	0.014**	0.013**	0.013**	0.013**	0.013**	0.013**	0.012**
	(3.73)	(3.82)	(3.82)	(3.83)	(3.83)	(3.72)	(3.67)	(2.56)	(2.51)	(2.51)	(2.51)	(2.51)	(2.41)	(2.24)
Constant	-0.117***	-0.130***	-0.135***	-0.136***	-0.136***	-0.114***	-0.112***	-0.111***	-0.122***	-0.130***	-0.130***	-0.131***	-0.094***	-0.092**
	(-4.76)	(-5.20)	(-5.36)	(-5.40)	(-5.43)	(-4.67)	(-4.63)	(-3.04)	(-3.36)	(-3.56)	(-3.58)	(-3.61)	(-2.59)	(-2.53)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11785	11904	11904	11904	11904	11785	11785	11785	11904	11904	11904	11904	11785	11785
Number of firms	2276	2312	2312	2312	2312	2276	2276	2276	2312	2312	2312	2312	2276	2276
R-squared	0.282	0.283	0.284	0.284	0.284	0.282	0.281	0.345	0.342	0.344	0.344	0.344	0.341	0.340

Note:

Table 1.5 reports results from OLS regressions of the social performance measures on risk measures and controls over the period 1991-2007. SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Systematic risk (mbetaw and mbetaffw) is the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. The explanatory variables include: firm size (lnmkteq), the book-to-market ratio (bmw), the net leverage (netlevw), the average implied cost of equity (ICC), the average daily share turnover (avgturnover), the coefficient of variation of daily share turnover over the previous year (cvturnover), the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w), Investment computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets (investment), expected growth in earnings (expgrthw), the distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and the size of investor base (inv_basew). The average implied cost of equity (ICC) is based on five ICC models: PEG ratio model of Easton (2004), MPEG ratio model of Easton (2004), ICC model of Ohlson and Juettner (2005), ICC model of Claus and Thomas (2001), and ICC model of Lee *et al.* (2009). Details on the implementation of the five models are available from authors upon request. All other variables are defined in footnotes of Table 1.1. Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

The results reported in Table 1.5 suggest that a firm's risk affects its SP, as well as its strengths and concerns components. Higher total and idiosyncratic risks are significantly and positively associated with both higher concerns and higher strengths scores. Similarly, higher risk (total and idiosyncratic) induces both higher concerns scores and higher strengths scores. This implies that the relation between SP and a firm's risk also runs from risk to SP, that is risk causes SP.

Up to this point, our regression equations (7, 8 or 9) assume that the independent variables of interest, either SP or risk measures, are exogenous. However, if one of these variables is endogenous, our results would be affected. This issue is examined in the next sections.

1.6.2. Correcting for the endogeneity of social performance[39]

The regression specification in equation (7 or 8) assumes that social performance SP is exogenous. However, SP may be endogenous because some of the regressors (e.g., firm size and industry) and unobserved variables could affect both SP and the firm's risk. In such cases, the explanatory variable SP_{it} is likely to be endogenous, and the coefficients estimates using standard OLS are biased and inconsistent.

To correct for this potential endogeneity problem, we use the instrumental variables regression method estimated using the two-step efficient generalized method of moments (GMM):[40]

$$SP_{it} = \gamma + \eta Z_{it-1} + + \theta Y_{it-1} + \omega_{it} \qquad (10)$$

$$Risk_{it} = \alpha_0 + \alpha_1 SP^{*}_{it-1} + \delta X_{it-1} + \varepsilon_{it} \qquad (11)$$

where Z_{it} denotes instruments, and Y_{it} denotes variables that affect social performance (e.g., firm size and industry). Chosen instruments should be correlated with SP but have zero or low correlation with the disturbance in the structural model for the firm's risk (equation 11). We use lagged SP, the median industry SP and a dummy variable for loss firms (i.e., those with negative free cash flow in the previous year) as instruments. When examining strengths and concerns measures, we consider lagged values of both measures. The three instruments could reasonably influence the current SP score. First, the current SP is highly correlated with the lagged SP (the correlation coefficient is 0.8) suggesting that SP tends to change slowly over time. Second, the use of the median industry SP allow us to control for industry differences in the SP scores because social issues are different for different industries and are time-varying (Carroll, 1999). Each industry has different configurations of

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[39] There are three potential sources of endogeneity: simultaneity bias; omitted variables bias; self-selection bias. Depending on the research question, one of two procedures is used to correct for endogeneity: Heckman two-step procedure for self-selection bias or Instrumental variable (IV) estimation.

[40] The GMM estimation generates efficient estimates of the coefficients and consistent estimates of the standard errors that are robust to the presence of arbitrary heteroskedasticity and clustering by firm.

stakeholders with disparate degrees of activism on the issues (Carroll, 1999). Third, according to the slack resources hypothesis, firms with negative free cash flow may not be able to invest in CSR domains, and thereby improve its SP.

In the second stage, we use the fitted value SP_{it}^{*} obtained in the first stage for equation (10) as the explanatory variable instead of the original value SP_{it}, and run the regression in equation (11). We only report the results of the second stage estimation.

Panel A of Table 1.6 shows that the aggregate measure SP which combines strengths and concerns is significantly and negatively related to stock return volatility computed using five-year monthly returns. The coefficient associated with SP becomes insignificant when stock return volatility is computed using the previous year's daily stock returns. Nonetheless, the result provides some support for our first hypothesis.

Both coefficients associated with the two aggregate measures of strengths Str and concerns Con are positive and statistically significant. However, the magnitude and statistical significance of the coefficients associated with the strengths measure are lower than those associated with the concerns measure. The difference is statistically significant at the 5% level when the dependent variable is the volatility computed using five-year monthly returns (p-value of the one-sided Wald test is 0.027).[41] Therefore, we conclude that both higher concerns scores and higher strengths scores increase volatility (total risk). The volatility increase associated with strengths is lower than that associated with concerns. This finding supports our fourth hypothesis. There is an asymmetric relation between social performance and total risk.

[41] The difference is not statistically significant when the dependent variable is the volatility computed using the previous year's daily stock returns (p-value of the one-sided Wald test is 0.185).

Table 1.6: Instrumental variables regressions between the risk measures and social performance

	Panel A: Total risk measures				Panel B: Idiosyncratic risk measures						Panel C: Systematic risk measures			
	Volatilityw	Volatilityw	dvolatilityw	dvolatilityw	sdresCAPMw	sdresCAPMw	sdresffw	sdresffw	sdres4ffw	sdres4ffw	mbetaw	mbetaw	mbetaffw	mbetaffw
SP	-0.1097**		-0.0382		-0.0470		-0.0541*		-0.0599*		0.0988		0.0308	
	(-2.11)		(-1.02)		(-1.43)		(-1.69)		(-1.89)		(0.253)		(0.243)	
Str		0.1118***		0.1179***		0.1217***		0.1231***		0.1250***		0.2243		0.1015
		(2.76)		(3.60)		(4.21)		(4.36)		(4.50)		(1.08)		(0.52)
Con		0.2643***		0.1687***		0.1915***		0.2016***		0.2119***		0.0525		0.0434
		(4.24)		(4.27)		(5.40)		(5.83)		(6.19)		(0.17)		(0.15)
lnmkteq	-0.0376***	-0.0427***	-0.0250***	-0.0292***	-0.0257***	-0.0303***	-0.0246***	-0.0294***	-0.0248***	-0.0298***	-0.0582***	-0.0631***	-0.0280***	-0.0304***
	(-20.94)	(-19.55)	(-18.15)	(-18.23)	(-20.23)	(-20.75)	(-19.77)	(-20.54)	(-20.00)	(-20.93)	(0.00857)	(-6.04)	(0.00752)	(-3.26)
bmw	-0.0307***	-0.0356***	0.0121*	0.0080	0.0122*	0.0087	0.0105*	0.0069	0.0096	0.0058	-0.0528	-0.0572	-0.0144	-0.0165
	(-3.31)	(-3.78)	(1.73)	(1.15)	(1.89)	(1.35)	(1.66)	(1.09)	(1.53)	(0.93)	(0.0416)	(-1.36)	(0.0405)	(-0.40)
netlevw	-0.0135	-0.0129	-0.0029	-0.0021	-0.0000	-0.0012	-0.0008	-0.0017	-0.0008	-0.0015	-0.135**	-0.1336**	-0.0274	-0.0271
	(-1.19)	(-1.14)	(-0.37)	(-0.27)	(-0.00)	(-0.16)	(-0.11)	(-0.24)	(-0.11)	(-0.21)	(0.0560)	(-2.39)	(0.0495)	(-0.55)
ret1y	0.0213***	0.0228***	0.0001	0.0012	-0.0026	-0.0011	-0.0026	-0.0012	-0.0025	-0.0011	0.00454	0.0062	0.0987***	0.0995***
	(5.07)	(5.44)	(0.02)	(0.34)	(-0.77)	(-0.34)	(-0.81)	(-0.38)	(-0.78)	(-0.34)	(0.0209)	(0.30)	(0.0207)	(4.80)
avgturnover	7.7561***	7.8912***	6.0919***	6.2025***	5.4252***	5.5562***	5.2329***	5.3721***	5.0744***	5.2207***	27.98***	28.1004***	16.23***	16.2772***
	(20.01)	(20.32)	(20.40)	(20.69)	(20.15)	(20.55)	(19.83)	(20.28)	(19.27)	(19.74)	(1.927)	(14.50)	(1.771)	(9.12)
cvturnover	0.0024	0.0004	0.0614***	0.0598***	0.0762***	0.0727***	0.0800***	0.0763***	0.0813***	0.0775***	-0.161***	-0.1625***	-0.144***	-0.1454***
	(0.46)	(0.08)	(9.44)	(9.25)	(11.29)	(10.87)	(11.70)	(11.25)	(11.83)	(11.38)	(0.0245)	(-6.59)	(0.0229)	(-6.31)
dispeps1w	-0.0165	-0.0212	0.0462***	0.0425***	0.0420***	0.0371***	0.0404***	0.0356***	0.0367***	0.0319***	-0.0460	-0.0511	0.210***	0.2066***
	(-1.12)	(-1.46)	(3.86)	(3.60)	(3.87)	(3.47)	(3.77)	(3.37)	(3.47)	(3.05)	(0.0774)	(-0.66)	(0.0784)	(2.65)
investment	0.1054***	0.1032***	0.1050***	0.1030***	0.0991***	0.0941***	0.0943***	0.0893***	0.0925***	0.0876***	0.218	0.2169	0.0860	0.0861
	(3.68)	(3.63)	(5.67)	(5.59)	(6.04)	(5.76)	(5.88)	(5.60)	(5.84)	(5.56)	(0.136)	(1.59)	(0.143)	(0.60)
expgrthw	0.1641***	0.1647***	0.1229***	0.1231***	0.1059***	0.1067***	0.0998***	0.1007***	0.0979***	0.0988***	0.651***	0.6507***	0.370***	0.3697***
	(8.00)	(8.04)	(9.85)	(9.90)	(9.12)	(9.25)	(8.78)	(8.93)	(8.70)	(8.85)	(0.0922)	(7.05)	(0.0827)	(4.47)
zscorew	-0.0021***	-0.0020***	-0.0003	-0.0001	-0.0005**	-0.0004*	-0.0006**	-0.0004*	-0.0005**	-0.0004*	-0.0125***	-0.0124***	-0.0113***	-0.0113***
	(-4.19)	(-3.95)	(-0.86)	(-0.44)	(-2.12)	(-1.65)	(-2.30)	(-1.78)	(-2.21)	(-1.67)	(0.00261)	(-4.77)	(0.00258)	(-4.37)
sdroa5yw	0.9675***	0.9537***	0.4094***	0.3981***	0.3865***	0.3750***	0.3740***	0.3619***	0.3665***	0.3538***	3.273***	3.2609***	1.278***	1.2728***
	(16.77)	(16.61)	(11.89)	(11.62)	(12.66)	(12.39)	(12.59)	(12.29)	(12.55)	(12.24)	(0.274)	(11.88)	(0.270)	(4.71)
inv_basew	-0.0477***	-0.0532***	-0.0317***	-0.0363***	-0.0254***	-0.0298***	-0.0245***	-0.0290***	-0.0237***	-0.0285***	-0.271***	-0.2764***	-0.116***	-0.1183***
	(-5.04)	(-5.69)	(-5.31)	(-6.31)	(-4.66)	(-5.63)	(-4.60)	(-5.62)	(-4.49)	(-5.56)	(0.0450)	(-6.07)	(0.0416)	(-2.81)
Constant	0.4474***	0.4728***	0.4076***	0.4282***	0.3796***	0.4044***	0.3672***	0.3929***	0.3683***	0.3944***	1.269***	1.2922***	0.832***	0.8434***
	(16.23)	(17.89)	(15.91)	(18.76)	(16.76)	(20.39)	(16.02)	(19.70)	(15.90)	(19.71)	(0.137)	(9.37)	(0.155)	(5.39)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12392	12392	12398	12398	12398	12398	12398	12398	12398	12398	12392	12392	12392	12392
Number of firms	2438	2438	2438	2438	2438	2438	2438	2438	2438	2438	2438	2438	2438	2438
R-squared	0.632	0.634	0.613	0.616	0.620	0.623	0.616	0.620	0.616	0.620	0.428	0.428	0.189	0.190
J statistic p-value	0.8253	0.7963	0.3771	0.2451	0.2833	0.4427	0.5135	0.2476	0.4648	0.1939	0.3513	0.3057	0.4890	0.4655

Note:

Table 1.6 report results from instrumental variables (IV) regressions of the risk measures on the social performance measures and controls over the period 1991–2007. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Systematic risk (mbetaw and mbetaffw) is the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). The explanatory variables include: firm size (lnmkteq), the book-to-market ratio (bmw), the net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the average daily share turnover (avgturnover), the coefficient of variation of daily share turnover over the previous year (cvturnover), the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w), Investment computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets (investment), expected growth in earnings (expgrthw), the distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and the size of investor base (inv_basew). All variables are defined in footnotes of Table 1.1. The IV regressions are estimated using the two-step efficient generalized method of moments (GMM). We use three instruments: lagged SP, the median industry SP and a dummy variable for loss firms (i.e., equals to one for firms with negative free cash flow in the previous year, and zero otherwise). J statistic p-value is the p-value of the Hansen J statistic (overidentification test of all instruments). Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

The results are similar using idiosyncratic risk, except for the aggregate SP measure which remains negatively, but becomes marginally, related to the firm's idiosyncratic risk from the three and four factor models (Panel B of Table 1.6). After controlling for endogeneity, both coefficients associated with the two aggregate measures of strengths Str and concerns Con are positive and statistically significant. Similar to the results for total risk, the magnitude and statistical significance of the coefficients associated with the strengths measure are lower than those associated with the concerns measure. The p-values of the one-sided Wald test are 0.104, 0.066 and 0.044, respectively. These results support our fourth hypothesis.

As reported in Panel C of Table 1.6, none of the coefficients associated with the aggregate measure of SP or the two aggregate measures of strengths Str and concerns Con are significant[42]. Overall, social performance in aggregate or their strengths or concerns components seem not related to systematic risk. These findings do not support our hypotheses but are consistent with previously reported results.

1.6.3. Simultaneous equation framework

Another potential source of endogeneity is **simultaneity bias**, that is SP and the firm's risk may be jointly determined. Waddock and Graves (1997) find that SP is both a predictor and consequence of financial performance. That is, there is a simultaneous relationship, or a kind of 'virtuous circle', which they explain by a simultaneous and interactive impact between theoretical arguments such as the slack resources theory and the stakeholder theory. Based on a meta-analysis of 18 studies that examine the relationship between SP and firm risk in any form, Orlitzky and Benjamin (2001) find that prior SP is negatively related to subsequent firm risk, and prior firm risk is negatively related to subsequent SP. To correct for this particular form of endogeneity, we use a **simultaneous equations system** where SP affects the firm's risk and is, in turn, affected by the latter. Specifically, we estimate the following three-equation vector autoregressive (VAR) model:

$$\begin{cases} Str_{it} = \alpha_0 + \lambda_1 Risk_{it-1} + \beta_1 Str_{it-1} + \gamma_1 Con_{it-1} + \theta X_{it-1} + \omega_{it} \\ Con_{it} = \alpha_1 + \lambda_2 Risk_{it-1} + \beta_2 Str_{it-1} + \gamma_2 Con_{it-1} + \delta X_{it-1} + \varepsilon_{it} \\ Risk_{it} = \alpha_2 + \lambda_3 Risk_{it-1} + \beta_3 Str_{it-1} + \gamma_3 Con_{it-1} + \psi X_{it-1} + \mu_{it} \end{cases} \quad (12)$$

where $Risk_{it}$ is the risk measure for firm i at time t, and Str_{it} (Con_{it}) is the strengths (concerns) measure for firm i at time t. The three equations of the system have the same set of control variables. This is achieved by using the same proxy for expected return. That is, we

[42] The coefficient associated with the aggregate concerns measure, computed without exclusionary screens Conwe, is positive (0.655) and significant (t-statistic of 3.25) when the dependent variable is the systematic risk computed from the CAPM (result not tabulated).

replace the annualized return from the previous year's daily stock returns by the implied cost of equity capital in the Risk equation. Our main variables of interest (i.e., Risk, Str and Con) are now treated as endogenous.

The use of the VAR approach with panel data requires that we relax the constraint of the same underlying structure for each firm. In other words, we need to account for the individual heterogeneity in the levels of the variables. Specifically, we follow Love and Zicchino (2006) by estimating the VAR after removing firm (fixed) effects and time effects from all the variables involved. We first remove the fixed effects, and then remove the time effects from the data. The fixed effects are removed from the data using the forward mean-differencing procedure. This procedure requires the calculation of the orthogonal deviation for each firm-year observation by taking the difference between the observation and the forward mean (i.e., the mean of all future observations available for each firm-year). The time effects are removed from the data by subtracting the means of each variable calculated for each year. The VAR is estimated using the least squares (LS) method.

Table 1.7: VAR regressions between the risk and social performance measures

	Panel A: Total risk measures					
	Volatilityw	**Str**	**Con**	**dvolatilityw**	**Str**	**Con**
Risk	0.669***	0.003	0.022***	0.423***	0.016***	0.029***
	[102.20]	[1.21]	[6.18]	[51.73]	[6.19]	[8.04]
Str	0.251***	0.588***	0.003	0.091***	0.585***	0.000
	[13.13]	[77.13]	[0.35]	[3.91]	[77.22]	[0.08]
Con	0.137***	-0.006	0.489***	0.019	-0.006	0.488***
	[9.03]	[-1.08]	[58.53]	[1.05]	[-1.01]	[58.8]
lnmkteq	-0.008***	0.006***	0.008***	-0.012***	0.006***	0.007***
	[-7.89]	[15.91]	[14.33]	[-9.86]	[16.39]	[13.38]
bmw	-0.013***	0.008***	0.011***	0.046***	0.008***	0.009***
	[-3.62]	[5.84]	[5.60]	[10.68]	[5.72]	[4.85]
netlevw	-0.024***	0.007***	0.010***	0.040***	0.005***	0.008***
	[-4.52]	[3.28]	[3.50]	[6.14]	[2.68]	[2.74]
ICC	-0.031	0.025***	0.007	0.215***	0.023***	0.007
	[-1.45]	[2.95]	[0.64]	[8.20]	[2.70]	[0.64]
avgturnover	1.309***	-0.259***	0.077	4.856***	-0.343***	0.012
	[8.70]	[-4.32]	[0.93]	[26.31]	[-5.73]	[0.14]
cvturnover	0.007***	0.000	-0.000	0.050***	0.000	-0.000
	[3.41]	[0.46]	[-0.24]	[19.00]	[0.54]	[-0.23]
dispeps1w	-0.006	0.001	0.005	0.057***	0.001	0.004
	[-1.01]	[0.74]	[1.59]	[7.11]	[0.39]	[1.14]
investment	-0.043***	-0.004	0.003	0.064***	-0.003831	0.001
	[-2.90]	[-0.70]	[0.45]	[3.57]	[-0.65]	[0.15]
expgrthw	0.005	-0.003	-0.008	0.006	-0.003	-0.007
	[0.71]	[-1.11]	[-1.95]	[0.65]	[-1.00]	[-1.82]
zscorew	-0.000***	-0.000***	-0.000***	0.002***	-0.000***	-0.000***
	[-0.551]	[-3.62]	[-3.06]	[7.13]	[-3.73]	[-2.91]
sdroa5yw	0.365***	-0.018***	-0.011	0.021	-0.022***	-0.011
	[17.07]	[-2.17]	[-1.01]	[0.83]	[-2.64]	[-1.01]
inv_basew	-0.000	-0.000	-0.002	-0.003	-0.000	-0.003
	[-0.02]	[-0.13]	[-0.96]	[-0.55]	[-0.21]	[-1.25]
Constant	-0.157***	0.038***	0.043***	-0.163***	0.041***	0.036***
	[-14.07]	[8.57]	[7.09]	[-12.77]	[9.97]	[6.45]
Observations	9645	9645	9645	9734	9734	9734
R-squared	0.64	0.46	0.30	0.41	0.46	0.30

Table 1.7: VAR regressions between the risk and social performance measures (continued)

	Panel B: Idiosyncratic risk measures								
	sdresCAPMw	Str	Con	sdresffw	Str	Con	sdres4ffw	Str	Con
Risk	0.381***	0.018***	0.031***	0.376***	0.019***	0.032***	0.375***	0.019***	0.032***
	[46.14]	[6.50]	[8.06]	[45.58]	[6.60]	[7.96]	[45.51]	[6.69]	[7.96]
Str	0.093***	0.584***	-0.000	0.095***	0.584***	-0.000	0.094***	0.584***	-0.000
	[4.24]	[77.15]	[-0.01]	[4.46]	[77.12]	[-0.04]	[4.46]	[77.11]	[-0.05]
Con	0.017	-0.005	0.489***	0.020	-0.006	0.488***	0.020	-0.005	0.489***
	[1.01]	[-0.98]	[58.85]	[1.19]	[-0.99]	[58.83]	[1.24]	[-0.98]	[58.84]
lnmkteq	-0.014***	0.007***	0.008***	-0.013***	0.007***	0.008***	-0.013***	0.007***	0.008***
	[-11.77]	[16.70]	[13.77]	[-11.14]	[16.71]	[13.77]	[-11.51]	[16.77]	[13.84]
bmw	0.047***	0.008***	0.009***	0.045***	0.008***	0.009***	0.043***	0.008***	0.009***
	[11.68]	[5.76]	[4.91]	[11.36]	[5.80]	[4.96]	[10.86]	[5.82]	[4.99]
netlevw	0.043***	0.005**	0.008***	0.040***	0.005***	0.008***	0.040***	0.005**	0.008***
	[6.88]	[2.63]	[2.70]	[6.65]	[2.64]	[2.73]	[6.76]	[2.63]	[2.73]
ICC	0.213***	0.022***	0.007	0.202***	0.023***	0.007	0.205***	0.023***	0.007
	[8.64]	[2.69]	[0.62]	[8.42]	[2.72]	[0.66]	[8.65]	[2.72]	[0.66]
avgturnover	4.352***	-0.328***	0.045	4.219***	-0.324***	0.054	4.022***	-0.320***	0.061
	[25.32]	[-5.53]	[0.55]	[25.19]	[-5.48]	[0.67]	[24.34]	[-5.43]	[0.75]
cvturnover	0.061***	0.000	-0.000	0.064***	0.000	-0.000	0.065***	0.000	-0.000
	[24.75]	[0.37]	[-0.45]	[26.30]	[0.32]	[-0.51]	[26.99]	[0.29]	[-0.54]
dispeps1w	0.052***	0.001	0.004	0.049***	0.001	0.004	0.043***	0.001	0.004
	[6.93]	[0.41]	[1.18]	[6.77]	[0.40]	[1.18]	[6.02]	[0.41]	[1.20]
investment	0.061***	-0.003	0.001	0.068***	-0.003	0.001	0.065***	-0.003	0.001
	[3.63]	[-0.60]	[0.20]	[4.13]	[-0.59]	[0.22]	[4.00]	[-0.58]	[0.22]
expgrthw	0.002	-0.002	-0.007*	-0.000	-0.002	-0.007*	-0.001	-0.002	-0.007*
	[0.32]	[-0.95]	[-1.76]	[-0.07]	[-0.96]	[-1.76]	[-0.14]	[-0.95]	[-1.76]
zscorew	0.001***	-0.000***	-0.000***	0.001***	-0.000***	-0.000***	0.001***	-0.000***	-0.000***
	[5.48]	[-3.66]	[-2.82]	[5.27]	[-3.65]	[-2.81]	[5.53]	[-3.67]	[-2.83]
sdroa5yw	0.027	-0.021***	-0.009	0.032	-0.021***	-0.009	0.024	-0.020***	-0.008
	[1.16]	[-2.56]	[-0.85]	[1.37]	[-2.54]	[-0.80]	[1.05]	[-2.50]	[-0.73]
inv_basew	0.000	-0.000	-0.003	0.000	-0.000	-0.003	0.000	-0.000	-0.003
	[0.07]	[-0.27]	[-1.33]	[0.13]	[-0.24]	[-1.30]	[0.07]	[-0.23]	[-1.28]
Constant	-0.165***	0.042***	0.038***	-0.155***	0.042***	0.038***	-0.159***	0.043***	0.039***
	[-13.67]	[10.21]	[6.73]	[-13.09]	[10.24]	[6.72]	[-13.54]	[10.31]	[6.79]
Observations	9734	9734	9734	9734	9734	9734	9734	9734	9734
R-squared	0.40	0.46	0.30	0.39	0.46	0.30	0.39	0.46	0.30

Table 1.7: VAR regressions between the risk and social performance measures (Continued)

	Panel C: Systematic risk measures					
	mbetaw	**Str**	**Con**	**mbetaffw**	**Str**	**Con**
Risk	0.738***	0.000	0.001	0.603***	0.000	0.000
	[109.85]	[0.24]	[1.93]	[71.20]	[0.16]	[0.06]
Str	0.073	0.588***	0.001	0.038	0.587***	0.000
	[0.87]	[76.96]	[0.18]	[0.32]	[77.16]	[0.03]
Con	0.258***	-0.006	0.491***	0.083	-0.006	0.490***
	[3.86]	[-1.05]	[58.55]	[0.90]	[-1.06]	[58.50]
lnmkteq	-0.074***	0.006***	0.008***	-0.011*	0.006***	0.007***
	[-15.35]	[15.62]	[13.40]	[-1.72]	[15.99]	[13.30]
bmw	-0.051***	0.008***	0.010***	-0.031	0.008***	0.009***
	[-3.28]	[5.74]	[5.14]	[-1.44]	[5.74]	[4.99]
netlevw	-0.130***	0.007***	0.010***	-0.028	0.007***	0.009***
	[-5.45]	[3.24]	[3.38]	[-0.85]	[3.23]	[3.26]
ICC	-0.170*	0.025***	0.005	-0.045	0.025***	0.006
	[-1.79]	[2.93]	[0.50]	[-0.34]	[2.93]	[0.50]
avgturnover	7.873***	-0.248***	0.143**	3.302***	-0.246***	0.169**
	[11.95]	[-4.15]	[1.73]	[3.69]	[-4.17]	[2.08]
cvturnover	-0.044***	0.000	-0.000	-0.027**	0.000	-0.000
	[-4.58]	[0.43]	[-0.37]	[-2.04]	[0.42]	[-0.47]
dispeps1w	0.041	0.001	0.005	0.067	0.001	0.005
	[1.43]	[0.72]	[1.48]	[1.70]	[0.72]	[1.50]
investment	-0.075	-0.004	0.001	-0.259***	-0.004	0.001
	[-1.16]	[-0.76]	[0.19]	[-2.89]	[-0.76]	[0.13]
expgrthw	0.088**	-0.003	-0.007	-0.042	-0.003	-0.006
	[2.62]	[-1.05]	[-1.65]	[-0.91]	[-1.05]	[-1.60]
zscorew	0.001	-0.000***	-0.000***	-0.002**	-0.000***	-0.000***
	[1.60]	[-3.57]	[-2.83]	[-2.04]	[-3.56]	[-2.78]
sdroa5yw	1.162***	-0.016**	0.001	0.516***	-0.016**	0.003
	[12.56]	[-1.97]	[0.09]	[4.09]	[-1.96]	[0.33]
inv_basew	-0.056**	-0.000	-0.003	-0.025	-0.000	-0.004
	[-2.40]	[-0.20]	[-1.27]	[-0.77]	[-0.21]	[-1.37]
Constant	-0.855***	0.036***	0.033***	-0.532***	0.036***	0.029***
	[-17.67]	[8.30]	[5.44]	[-8.37]	[8.63]	[5.00]
Observations	9645	9645	9645	9645	9645	9645
R-squared	0.67	0.46	0.30	0.35	0.46	0.30

Note:

Table 1.7 report results from the vector autoregression (VAR) of the simultaneous equations system where the dependent variables are the risk, strengths and concerns measures over the period 1991-2007. Str (Con) is the aggregate measure of strengths (concerns). Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Systematic risk (mbetaw and mbetaffw) is the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. The explanatory variables include: firm size (lnmkteq), the book-to-market ratio (bmw), the net leverage (netlevw), the average implied cost of equity (ICC),

the average daily share turnover (avgturnover), the coefficient of variation of daily share turnover over the previous year (cvturnover), the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w), Investment computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets (investment), expected growth in earnings (expgrthw), the distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and the size of investor base (inv_basew). The average implied cost of equity (ICC) is based on five ICC models: PEG ratio model of Easton (2004), MPEG ratio model of Easton (2004), ICC model of Ohlson and Juettner (2005), ICC model of Claus and Thomas (2001), and ICC model of Lee *et al.* (2009). Details on the implementation of the five models are available from authors upon request. All variables are defined in footnotes of Table 1.1. The VAR is estimated using the least squares (LS) method after removing the fixed effects and time effects from the data. The fixed effects are removed from the data using the forward mean-differencing procedure. The time effects are removed from the data by subtracting the means of each variable calculated for each year. Unreported industry controls are based on the Fama and French (1997) industry classification. Robust t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

Table 1.7 reports the results of the VAR estimation. Panel A and B show that the aggregate measure of strengths Str is significantly and positively related to stock return volatility and idiosyncratic risk regardless of how they are measured. Except for the insignificant coefficient associated with the volatility computed using five-year monthly returns, stock return volatility and idiosyncratic risk are also significantly and positively related to the aggregate measure of strengths Str. This positive relation runs in both directions. Consistent with the results of Orlitzky and Benjamin (2001), SP affects the firm's risk and is, in turn, affected by the latter. That is, higher risk (total and idiosyncratic) motivates higher strengths scores, while at the same time higher strengths scores induce higher risk (total and idiosyncratic).

Table 1.7 shows that the aggregate measure of concerns Con is significantly and positively related only to stock return volatility computed using five-year monthly returns (Panel A) and systematic risk computed using the CAPM (Panel C). However, stock return volatility and idiosyncratic risk, regardless of how they are measured, are significantly and positively related to the aggregate measure of concerns Con (Panel A and B). This positive relation runs in one direction. That is, higher total and idiosyncratic risks induce higher concerns scores.

One of the advantages of using the VAR approach is that it allows us to examine the direction of the causation between firm risk and strengths and concerns of SP using the Granger causality test (Granger, 1969), which can be constructed from the estimated VAR coefficients (Wald test). It is called Granger causality because it does not necessarily correspond with standard definition of causation, rather it focuses on lead-lag relationships between the variables of interest (Scholtens, 2008).[43] Specifically, for each equation in the VAR, we can test the hypotheses that each of the other endogenous variables does not Granger-cause the dependent variable in that equation. For example, if the coefficient β_3 is significant, then the strengths Granger causes risk. Similarly, if the coefficient (β_3) is significant, then risk Granger causes the strengths. If both coefficients (β_3 and λ_1) are significant, then there is bi-directional causality between the strengths and risk.

Table 1.8 reports the probabilities of the Granger causality tests which confirm the results reported in Table 1.7. There is a bi-directional causality between firm's risk and strengths. Specifically, higher total and idiosyncratic risks lead to higher strengths scores; and at the same time, higher strengths scores lead to higher total and idiosyncratic risks. There is also evidence of a unidirectional causality from firm's risk to concerns. That is, higher total and idiosyncratic risks lead to higher concerns scores. Table 1.8 also reports an important result about the direction of causation between strengths and concerns. The evidence suggests that strengths do not Granger cause concerns. Similarly, concerns do not Granger cause strengths. These findings suggest that firms do not undertake CSR investments (i.e., increase their strengths) in order to compensate for current or future concerns (Greenwash theory). Alternatively, the evidence indicates that there is no substitution effect between strengths and concerns.[44]

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[43] Some studies have examined the direction of the causation between financial performance and social performance using Granger causality test (e.g., Scholtens, 2008; Nelling and Webb, 2009).

[44] The econometric specification in (12) treats SP (i.e., strengths and concerns) and risk as endogenous, whereas it treats the cost of equity (ICC) as exogenous. The latter could be endogenous as well. For example, it is possible that SP affects the expected return-risk relationship by affecting both risk and the expected return. Therefore, we test the proposition that the firm's risk, the expected return (i.e., cost of equity) and SP are jointly determined by estimating a four-equation vector autoregressive (VAR) model (the dependent variable of the fourth equation is the cost of equity). The untabulated results are similar to those reported and are available from the authors upon request.

Table 1.8: Granger causality between the risk measures and the strengths and concerns of social performance

	Total risk		Idiosyncratic risk			Systematic risk	
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	mbetaw	mbetaffw
Null Hypothesis:							
CON does not Granger Cause RISK	0.00	0.29	0.30	0.23	0.21	0.00	0.36
RISK does not Granger Cause CON	0.00	0.00	0.00	0.00	0.00	0.05	0.94
STR does not Granger Cause RISK	0.00	0.00	0.00	0.00	0.00	0.38	0.74
RISK does not Granger Cause STR	0.22	0.00	0.00	0.00	0.00	0.80	0.86
CON does not Granger Cause STR	0.27	0.31	0.32	0.31	0.32	0.28	0.28
STR does not Granger Cause CON	0.72	0.91	0.99	0.96	0.95	0.85	0.96
Observations	9645	9734	9734	9734	9734	9645	9645

Note:

Table 1.8 presents the probabilities of the Granger causality tests between the risk measures and the strengths and concerns of SP over the period 1991–2007. Str (Con) is the aggregate measure of strengths (concerns). Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Systematic risk (mbetaw and mbetaffw) is the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. The Granger causality tests are constructed from the estimated coefficients of the vector autoregression (VAR). The VAR is estimated using the least squares (LS) method after removing the fixed effects and time effects from the data. The fixed effects are removed from the data using the forward mean-differencing procedure. The time effects are removed from the data by subtracting the means of each variable calculated for each year. For each equation in the VAR, we test the hypotheses that each of the other endogenous variables does not Granger-cause the dependent variable in that equation.

1.6.4. Additional control variables

We run several sensitivity tests to examine whether our results are robust to alternative model specifications. Specifically, we re-estimate our basic model after replacing and/or adding several control variables. First, we replace expected growth (mean annualized five-year earnings growth rate from I/B/E/S) by average five-year sales growth, and book-to-market ratio by Tobin's Q. Second, we use Amihud illiquidity measure computed as in Amihud (2002) as an alternative measure of firm liquidity. Third, we use the percentage signed (absolute) forecast error as an alternative measure of earnings variability. Forecast error is measured as the difference between the one-year ahead median earnings forecast and the actual earnings deflated by the stock price at the measurement date of our dependent variables. Fourth, we use two alternative proxies for default risk instead of the Zscore: bond rating and investment grade rating. Bond Rating is a dummy variable equal to one if the long term debt of the firm is rated and equal to zero otherwise. Firms without rating are expected to be more risky than those having a rating. Conditional on having a rating, firms are categorized as investment grade if they have a rating higher than BB+ and as junk bonds if they have a rating of BB+ or less. Investment grade rating is a dummy variable equal to one if S&P debt rating is higher than BB+ and equal to zero otherwise. Investment grade debt is expected to be less risky than junk bonds. Finally, we include as an additional control variable the free cash flow to equity (or to the firm).[45] Overall, our untabulated results are robust to all these alternative model specifications.[46]

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[45] The free cash flow to equity is computed as net income plus depreciation minus capital expenditures minus changes in non cash working capital minus net debt issues minus preferred dividends. The free cash flow to the firm is computed as EBIT minus tax paid plus depreciation minus capital expenditures minus changes in non cash working capital.

[46] The untabulated results are available from the authors upon request. The inclusion of some of these variables (e.g., bond rating or investment grade rating) significantly reduces the number of observations (not all firms are rated) and the goodness of fit of the model. The model used in this paper provides the highest R-square (i.e., trade-off between model parsimony and the inclusion of additional explanatory variables).

1.7. Conclusion

This paper examines the relation between firm risk and social performance. We use a large U.S. data set covering the period 1991-2007, examine several econometric specifications of our basic model, and use different estimation techniques. The main results can be summarized as follows. The aggregate measure SP which combines strengths and concerns is significantly and negatively related to stock return volatility. After splitting the aggregate measure SP into its strengths and concerns components, we find that both higher concerns scores and higher strengths scores increase total risk. The volatility increase associated with strengths is lower than that associated with concerns.

The increased total risk is mainly due to increased idiosyncratic risk and not to systematic risk. Specifically, both concerns and strengths scores are positively related to the firm's idiosyncratic risk. Firms having higher concerns (strengths) scores have higher idiosyncratic risk. The idiosyncratic risk increase associated with strengths is lower than that associated with concerns. These findings are consistent with studies showing that idiosyncratic risk matters and is priced by investors (e.g., Goyal and Santa-Clara, 2003; Ang *et al.*, 2006; Fangjian, 2009).

We also examine the reverse causality issue and find that a firm's risk affects its SP, as well as its strengths and concerns components. Specifically, we find that total and idiosyncratic risks are significantly and positively associated with both concerns and strengths scores. Higher risk (total and idiosyncratic) induces both higher concerns scores and higher strengths scores. This implies that the relation between SP and a firm's risk also runs from risk to SP, that is risk causes SP.

Finally, we examine the relation between firm risk and SP using vector autoregressive (VAR) approach and the associated Granger causality tests. The results show that there is a bi-directional causality between firm's risk and strengths. Specifically, higher total and idiosyncratic risks lead to higher strengths scores; and at the same time, higher strengths scores lead to higher total and idiosyncratic risks. There is also evidence of a unidirectional causality from firm's risk to concerns. That is, higher total and idiosyncratic risks lead to

higher concerns scores. Moreover, we do not find any evidence of substitution effect between strengths and concerns.

In summary, our results suggest that SP is related to a firm's total risk mainly due to idiosyncratic risk. They also suggest that both concerns score and strengths score are positively related to the firm's volatility and idiosyncratic risk. The relation between strengths and firm risk runs in both directions, whereas the relation between concerns and firm risk runs in one direction. There is also evidence of an asymmetric relation between firm risk and SP where the impact of concerns on risk is stronger than the impact of strengths.

APPENDIX 1.1

DETAILED DESCRIPTION OF MSCI ESG STATS (KLD)'S DATABASE

Appendix 1.1 : Detailed description of MSCI ESG STATS (KLD)'s database

KLD Research & Analytics, Inc (KLD) is an independent rating service that focuses on assessment of social performance (SP) based on several dimensions. To assess SP, KLD gathers data from internal and external sources to the firm (Waddock and Graves, 1997; McWilliams and Siegel, 2000). Corporate data sources include annual reports, 10K forms, proxy statements, quarterly reports and reports issued for specific SP domains. External data sources include press articles, periodicals, academic articles, government reports, trade magazines, and general media. In addition, each firm's investor relations office receives a yearly questionnaire about SP practices.

Summary of KLD's annual data:

KLD coverage

From 1991 to 2000, KLD database covers approximately 650 firms listed on the S&P 500 and Domini 400 Social Index. In 2001 and 2002, KLD database covers approximately 1100 firms listed on the S&P 500, the Domini 400 Social Index, and the Russell 1000 Index. From 2003 to 2007, KLD database covers approximately 3100 firms listed on the S&P 500, the Domini 400 Social Index, the Russell 1000 Index and the Russell 3000 Index.

For each firm covered, KLD database provides identifying company information (Name, Ticker, and CUSIP[47]) and index membership (Domini 400 Social Index, S&P 500, Russell 1000, Russell 2000, LCS, BMS). The Large Cap Social Index (LCS) and the Broad Market Social Index (BMS) are KLD proprietary social indexes launched in 2002 and 2003, respectively.

KLD's Strength and **Concern Ratings**

KLD assesses each firm on the basis of exclusionary and qualitative screens. Social screen (the expression of an investor's social, ethical or religious concern) is a non-financial criterion applied in the investment decision-making process (Kinder and Domini, 1997). Qualitative screens represent an assertion of what the proper role of the corporations in society should be (Kinder and Domini, 1997), since they are directly related to stakeholder groups (Waddock and Graves, 1997)[48].

KLD's database provides *Strength* ratings and *Concern* ratings for several indicators of seven qualitative screens as well as *Concern* ratings for several indicators of six exclusionary screens. It also provides total counts of all strengths and concerns in each of these 13 dimensions (screens). KLD ratings reflect data at calendar year end.

The seven **qualitative screens** include Community, Diversity, Employee relations, Environment, Product, Human Rights (formerly "*non-US operations*" before 2002), and Corporate Governance (formerly "*Other*" category before 2002). The six **exclusionary screens** include Alcohol, Gambling, Firearms, Military, Nuclear power, and Tobacco.

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[47] CUSIP is not available from 1991 to 1994.

[48] For a more detailed discussion about the exclusionary and qualitative screens, see Kinder and Domini (1997), Waddock and Graves (1997), and the KLD Website: www.kld.com.

The indicators of qualitative screens include both positive and negative ratings (i.e., strengths and concerns), while indicators of the exclusionary screens include negative ratings (i.e., concerns) only. The KLD rating (either strength or concern) for a particular indicator within a particular qualitative screen is a binary variable which is equal to one if the firm has a strength or concern, and zero otherwise (i.e., the firm did not have a strength or concern). For example, a firm that implements pollution prevention and recycling programs will have a positive score along the environmental dimension. Conversely, a firm that has poor union relations and retirement benefits concerns will have a negative score along the employee relations dimension.

The KLD rating (concern) for a particular indicator within a particular exclusionary screen is also a binary variable which is equal to one if the firm has a concern, and zero otherwise (i.e., the firm did not have a concern for this particular indicator).

It is important to note that KLD implemented several changes in its database during the sample period. In fact, some screens (categories) as well as indicators have been changed, added, deleted, renamed, or moved to another category. For example, KLD renamed in 2002 the "*Other*" category as "Corporate Governance" and the "*non-US operations*" as "Human Rights". Also, KLD added the Climate Change Concern in 1999 and the Management Systems strength in 2006 under the Environment category.

The following table shows KLD's strengths and concerns as of 2007.

Appendix 1.1 (continued): KLD's Strengths and Concerns as of 2007

	Strengths	Concerns
Qualitative screens		
Community	- Charitable Giving - Innovative Giving - Non-US Charitable Giving - Support for Housing - Support for Education - Indigenous Peoples Relations - Volunteer Programs - Other Strength	- Investment Controversies - Negative Economic Impact - Indigenous Peoples Relations - Tax Disputes - Other Concern
Diversity	- CEO's identity - Promotion - Board of Directors - Work/Life Benefits - Women & Minority Contracting - Employment of the Disabled - Gay & Lesbian Policies - Other Strength	- Controversies (e.g., fines) - Non-Representation - Other Concern
Employee relations	- Union Relations - No-Layoff Policy - Cash Profit Sharing - Employee Involvement - Retirement Benefits Strength - Health and Safety Strength - Other Strength	- Union Relations - Health and Safety Concern - Workforce Reductions - Retirement Benefits Concern - Other Concern
Environment	- Beneficial Products and Services - Pollution Prevention - Recycling - Clean Energy - Communications - Property, Plant, and Equipment - Management Systems - Other Strength	- Hazardous Waste - Regulatory Problems - Ozone Depleting Chemicals - Substantial Emissions - Agricultural Chemicals - Climate Change - Other Concern
Product	- Quality - R&D/Innovation - Benefits to Economically Disadvantaged - Other Strength	- Product Safety - Marketing/Contracting Concern - Antitrust - Other Concern
Human Rights	- Positive Record in South Africa (1994-1995) - Indigenous Peoples Relations Strength - Labor Rights Strength - Other Strength	- South Africa (1991-1994) - Northern Ireland (1991-1994) - Burma Concern - Mexico (1995-2002) - Labor Rights Concern - Indigenous Peoples Relations Concern - Other Concern

Appendix 1.1 (continued): KLD's Strengths and Concerns as of 2007

	Strengths	Concerns
Qualitative screens (continued)		
Corporate Governance	- Limited Compensation - Ownership Strength - Transparency Strength - Political Accountability Strength - Other Strength	- High Compensation - Ownership Concern - Accounting Concern - Transparency Concern - Political Accountability Concern - Other Concern
Exclusionary screens:	**Concerns only**	
Alcohol	- Licensing - Manufacturers - Manufacturers of Products Necessary for Production of Alcoholic Beverages - Retailers - Ownership by an Alcohol Company - Ownership of an Alcohol Company - Alcohol Other Concern (through 2002)	
Gambling	- Licensing - Manufacturers - Owners and Operators - Supporting Products or Services - Ownership by a Gambling Company - Ownership of a Gambling Company - Gambling Other Concern (through 2002)	
Firearms	- Manufacturers - Retailers - Ownership by a Firearms Company - Ownership of a Firearms Company	
Military	- Manufacturers of Weapons or Weapons Systems - Manufacturers of Components for Weapons or Weapons Systems - Ownership by a Military Company - Ownership of a Military Company - Minor Weapons Contracting Involvement (1991-2002) - Major Weapons-related Supplier (1991-2002) - Military Other Concern (through 2002)	
Nuclear power	- Construction & Design of Nuclear Power Plants - Nuclear Power Fuel and Key Parts - Nuclear Power Service Provider - Ownership of Nuclear Power Plants - Ownership by a Nuclear Power Company - Ownership of a Nuclear Power Company - Design (through 2002) - Fuel Cycle/Key Parts (through 2002) - Nuclear Power Other Concern (through 2002)	

Appendix 1.1 (continued): KLD's Strengths and Concerns as of 2007

Exclusionary screens (continued):	Concerns only
Tobacco	- Licensing - Manufacturers - Manufacturers of Products Necessary for Production of Tobacco Products - Retailers - Ownership by a Tobacco Company - Ownership of a Tobacco Company - Tobacco Other Concern (through 2002)

Notes:

1- In the Human Rights category, South Africa, Northern Ireland, and Mexico Concerns and the positive record in South Africa (strength) are rated by KLD only for the indicated specific years.

2- The terms "through 2002" or "1991-2002" included in parenthesis for the exclusionary screens means that they are no longer rated by KLD since 2002.

3- The only type of rating in the exclusionary screens is a concern rating since they are primarily used as exclusionary criteria.

Source: www.kld.com

REFERENCES

Altman, E. 1993. *Corporate financial distress and bankruptcy*, Chap 5, John Wiley and Sons, New York.

Amihud, Y. (2002), « Illiquidity and stock returns: cross-section and time-series effects», *Journal of Financial Markets*, 5, 31-56.

Ang, A., Hodrick, R. J., Xing, Y., and Zhang, X. (2006), «The Cross-Section of Volatility and Expected Returns», *Journal of Finance*, 61, 259–299.

Barnea, A., and Rubin, A. (2010), « Corporate social responsibility as a conflict between shareholders», *Journal of Business Ethics*, 97, 71–86.

Baron, D., Harjoto, M., and Jo, H. (2011), «The economics and politics of corporate social performance», *Business and Politics*, 13, 1–46.

Bates, T. W., Kahle, K. M., and Stulz, R. (2009), « Why Do U.S. Firms Hold So Much More Cash than They Used To? », *Journal of Finance*, 64, 1985–2021.

Berk, J., Green, R. C., and Naik, V. (1999), « Optimal investment, growth options, and security returns », *Journal of Finance*, 54, 1553–1607.

Botosan, C. A., and Plumlee, M. A. (2005), «Assessing Alternative Proxies for the Expected Risk Premium», *The Accounting Review*, 80, 21-53.

Boutin-Dufresne, F. and Savaria, P. (2004), « Corporate Social Responsibility and Financial Risk», *Journal of Investing*, 13, 57-66.

Brennan, M. J., Chordia, T., and Subrahmanyam, A. (1998), «Alternative factor specifications, security characteristics, and the cross-section of expected stock returns», *Journal of Financial Economics*, 49, 345-373.

Carhart, M. M. (1997), «On Persistence in Mutual Fund Performance», *Journal of Finance*, 52, 57-82.

Carlson, M., Fisher, A., and Giammarino, R. (2004), « Corporate investment and asset price dynamics: Implications for the cross-section of returns », *Journal of Finance*, 59, 2577–2603.

Carlson, M., Fisher, A., and Giammarino, R. (2006), « Corporate Investment and Asset Price Dynamics: Implications for SEO Event Studies and Long-Run Performance », *Journal of Finance*, 61, 1009-1034.

Carroll, A. B. (1999), «Corporate Social Responsibility: Evolution of a Definitional Construct», *Business and Society*, 38, 268-295.

Cespa, G., and Cestone, G. (2007), «Corporate social responsibility and managerial entrenchment», *Journal of Economics and Management Strategy,* 16, 741-771.

Chordia, T., Subrahmanyam, A., and Anshuman, R. (2001), «Trading activity and expected stock returns», *Journal of Financial Economics*, 59, 3-32.

Claus, J., and Thomas, J. (2001), « Equity Premia as Low as Three Percent? », *Journal of Finance*, 56, 1629-1666.

Cochrane, J. (1991), « Production-based asset pricing and the link between stock returns and economic fluctuations », *Journal of Finance*, 46, 209–237.

Easton, P. (2004), « PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital », *Accounting Review,* 79, 73-95.

Edmans, A. (2011), « Does the stock market fully value intangibles? Employee satisfaction and equity prices », *Journal of Financial Economics*, in press. doi:10.1016/j.jfineco.2011.03.021.

El Ghoul, S., Guedhami, O., Kwok, C., and Mishra, D. (2011), «Does corporate social responsibility affect the cost of capital? », *Journal of Banking and Finance*, in press. doi:10.1016/j.jbankfin.2011.02.007.

Fama, E. F., and French, K. R. (1992), « The Cross-Section of Expected Stock Returns », *Journal of Finance*, 47, 427-465.

Fama, E. F., and French, K. R. (1993), « Common Risk Factors in the Returns on Stocks and Bonds », *Journal of Financial Economics*, 33, 3-56.

Fama, E. F., et French. K. R. (1997), « Industry cost of equity », *Journal of Financial Economics*, 43, 153-193.

Fama, E.F., and French, K.R. (2007), «Disagreement, tastes and asset prices», *Journal of Financial Economics*, 83, 667-689.

Fangjian, F. (2009), «Idiosyncratic risk and the cross-section of expected stock returns», *Journal of Financial Economics*, 91, 24-37.

Feldman, J., Soyka, P., Ameer, P. (1997), «Does improving a firm's environmental management system and environmental performance result in a higher stock price?», *Journal of Investing*, 6, 87-97.

Frooman, J. (1997), «Socially irresponsible and illegal behavior and shareholder wealth: a meta-analysis of event studies», *Business and Society*, 36, 221-249.

Gebhardt, W., Lee, C., and Swaminathan, B. (2001), « Toward an Implied Cost of Capital », *Journal of Accounting Research*, 39, 135-176.

Gode, D., and Mohanram, P. (2003), « Inferring the Cost of Capital Using the Ohlson-Juettner Model », *Review of Accounting* Studies, 8, 399-431.

Godfrey, P. C. (2005), «The relationship between corporate philanthropy and shareholder wealth: A risk management perspective», *Academy of Management Review*, 30, 777–798.

Godfrey, P. C., Merrill. C. B., and Hansen, J. M. (2009), «The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis», *Strategic Management Journal*, 30, 425-445.

Gordon, J. R., and Gordon, M. J. (1997), « The Finite Horizon Expected Return Model », *Financial Analysts Journal*, 53, 52-61.

Goss, A. (2007), « Essays on corporate social responsibility and financial performance », PhD dissertation, York University, Toronto.

Goss, A. (2012), « Corporate social performance and idiosyncratic risk: a variance decomposition analysis», 2012 Midwest Finance Association Annual Meeting (Midwest Finance Association).

Goss, A., and Roberts, G. S. (2011), «The impact of corporate social responsibility on the cost of bank loans», *Journal of Banking and Finance*, in press. doi:10.1016/j.jbankfin.2010.12.002.

Goyal, A., and Santa-Clara, P. (2003), «Idiosyncratic Risk Matters!», *Journal of Finance*, 58, 975–1008.

Granger, C. W. J. (1969), «Investigating causal relations by econometric models and cross-spectral methods», *Econometrica*, 37, 424–438.

Graves, S. B., and Waddock, S. A. (1994), « Institutional owners and corporate social performance», *Academy of Management Journal,* 37, 1034-1046.

Griffin, J. J. and Mahon, J. F. (1997), «The Corporate Social Performance and Corporate Financial Performance Debate: Twenty-five years of incomparable research», *Business and Society*, 36, 5-31.

Hail, L., and Leuz, C. (2006), « International differences in the cost of equity capital: Do legal institutions and securities regulation matter? », *Journal of Accounting Research*, 44, 485–531.

Harjoto, M. A., and Jo, H. (2008), « Corporate social responsibility and operating performance », *Journal of the Academy of Business and Economics*, 8, 59-71.

Harjoto, M. A., and Jo, H. (2011), «Corporate Governance and CSR Nexus», *Journal of Business Ethics*, 100, 45-67.

Heinkel, R., Kraus, A., and Zechner. J. (2001), « The Effect of Green Investment on Corporate Behavior », *Journal of Financial and Quantitative Analysis*, 36, p. 431-449.

Hillman, A., and Keim, G. D. (2001), «Shareholder value, stakeholder management, and social issues: What's the bottom line? », *Strategic Management Journal*, 22, 125-139.

Hong, H., and Kacperczyk, M. (2009), «The price of sin: The effects of social norms on markets», *Journal of Financial Economics*, 93, 15–36.

Ioannou, I., and Serafeim, G. (2010), «The impact of corporate social responsibility on investment recommendations», Working paper, Harvard Business School.

Kinder, P., and Domini, A. L. (1997), «Social screening: Paradigms old and new», *Journal of Investing*, 6, 12-19.

Lankoski, L. (2009), «Differential Economic Impacts of Corporate Responsibility Issues», *Business and Society*, 48, 206-224.

Lee, C., Ng, D., and Swaminathan, B. (2009), « Testing international asset pricing models using implied costs of capital », *Journal of Financial and Quantitative Analysis*, 44, 307-335.

Lee, D. D., and Faff, R. W. (2009), «Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective», *The Financial Review*, 44, 213-237.

Liu, L. X., Whited, T. M., and Zhang, L. (2007), « Investment-Based Expected Stock Returns », Working paper, Hong Kong University of Science and Technology.

Love, I., and Zicchino, L. (2006), «Financial development and dynamic investment behavior: Evidence from panel VAR», *The Quarterly Review of Economics and Finance*, 46, 190–210.

Luo, X., and Bhattacharya, C. B. (2009), «The Debate over Doing Good: Corporate Social Performance, Strategic Marketing Levers, and Firm-idiosyncratic Risk», *Journal of Marketing*, 73, 198-213.

Mackey, A., Mackey, T. B., and Barney, J. B. (2007), «Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies», *Academy of Management Review*, 32, 817 – 835.

Mahoney, L., and Roberts, R. W. (2007), «Corporate social performance, financial performance and institutional ownership in Canadian firms», *Accounting Forum*, 31, 233-253.

Malkiel, B.G., and Xu, Y. (1997), «Risk and return revisited», *Journal of Portfolio Management,* 23, 9–14.

Margolis, J. D., and Walsh, J. P. (2003), «Misery loves companies: rethinking social initiatives by business», *Administrative Science Quarterly*, 48, 268-305.

Mattingly, J. E., and Berman, S. L. (2006), «Measurement of Corporate Social Action: Discovering Taxonomy in the Kinder Lydenberg Domini Ratings Data», *Business and Society*, 45, 20-46.

McGuire, J. B., Sundgren, A., and Schneeweis, T. (1988), «Corporate Social Responsibility and Firm Financial Performance», *Academy of Management Journal*, 31, 854-872.

McWilliams, A. and Siegel, D. (2000), «Corporate Social Responsibility and Financial Performance: Correlation or Misspecification?», *Strategic Management Journal*, 21, 603-609.

Merton, R. C. (1987), «A simple model of capital market equilibrium with incomplete information», *Journal of Finance*, 42, 483–510.

Nelling, E., and Webb, E. (2009), «Corporate social responsibility and financial performance: the ''virtuous circle'' revisited», *Review of Quantitative Finance and Accounting*, 32, 197–209.

Ohlson, J., and Juettner-Nauroth, B. E. (2005), « Expected EPS and EPS Growth as Determinants of Value », *Review of Accounting Studies*, 10, 349-365.

Oikonomou, I., Brooks, C., and Pavelin, S. (2012), «The impact of corporate social performance on financial risk and utility: A longitudinal analysis», *Financial Management*, 41, 483–515.

Orlitzky M. and Benjamin J. D., (2001), «Corporate Social Performance and Firm Risk: A meta-analytic Review», *Business and Society*, 40, 369-396.

Orlitzky M., Schmidt F.L. and Rynes S.L., (2003), «Corporate social and financial performance: a meta-analysis», *Organization Studies*, 24, 403-441.

Salama, A, Anderson, K. P., and Toms, S. (2011), « Does community and environmental responsibility affect firm risk: Evidence from UK panel data 1994-2006», *Business Ethics: A European Review*, 20, 192-204.

Scholtens, B. (2008), «A note on the interaction between corporate social responsibility and financial performance», *Ecological Economics*, 68, 46 - 55.

Sharfman, M. P., Fernando, C. S. (2008), «Environmental risk management and the cost of capital», *Strategic Management Journal*, 29, 569-592.

Simpson, W. G., and Kohers, T. (2002), « The Link between Corporate Social and Financial Performance: Evidence from the Banking Industry», *Journal of Business Ethics*, 35, 97-109.

Social Investment Forum (SIF), 2010 Report on Socially Responsible Investing Trends in the United States. http://www.ussif.org/

Social Investment Organization (SIO), Canadian Socially Responsible Investment Review 2010. www.socialinvestment.ca

Spicer, B. H. (1978), «Investors, corporate social performance, and information disclosure: An empirical study», *The Accounting Review*, 53, 94-111.

Starks, L. (2009), «Corporate governance and corporate social responsibility: what do investors care about? what should investors care about? », *The Financial Review*, 44, 461–468.

Tsoutsoura, M. (2004), «Corporate social responsibility and financial performance», Working paper, Center for Responsible Business, Haas School of Business, University of California at Berkeley.

Waddock, S. A., and Graves, S. B. (1997), «The Corporate Social Performance-Financial Performance Link», *Strategic Management Journal*, 18, 303-319.

Witmer, J., and Zorn, L. (2007), « Estimating and Comparing the Implied Cost of Equity for Canadian and U.S. Firms », Bank of Canada Working Paper No. 2007–48.

CHAPITRE II

ARTICLE 2

THE IMPACT OF THE DIMENSIONS OF SOCIAL PERFORMANCE ON FIRM RISK

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THE IMPACT OF THE DIMENSIONS OF SOCIAL PERFORMANCE ON FIRM RISK

Abstract

This paper examines the impact of the individual dimensions of social performance (SP) on firm's risk (total and idiosyncratic) using 16,599 firm-year observations over the period 1991-2007. For the whole sample, we find that Employee, Diversity, Corporate Governance and Human Rights concerns positively affect firm's risk, whereas Diversity and Corporate Governance strengths positively affect firm's risk. When splitting the sample based on S&P500 membership, we find that Employee, Diversity and Corporate Governance concerns positively affect firm's risk, whereas Community (Diversity) strengths negatively (positively) affect firm's risk for S&P500 firms. For non S&P500 firms, Employee concerns and Diversity strengths positively affect firm's risk, whereas Environment strengths negatively affect firm's risk. We also find that the direction of causation tend to vary along the different SP dimensions.

Keywords: Volatility; Idiosyncratic risk; Social performance; Strengths; Concerns

2.1. Introduction

In recent years, corporate social responsibility (CSR) has received growing attention from both firms and the financial community. For example, 93% of the 766 CEOs surveyed by the UN Global Compact in 2010 believe that CSR issues will be critical to the future success of their business (Lacy *et al.,* 2010). Enhanced reputation and the potential for revenue growth and cost reduction are the main important factors driving CEOs to take CSR actions. In the demand side, assets in social responsible investing (SRI) represent 12.2% of all assets under management in the US (SIF, 2010), and major institutional investors from different countries have signed the Principles for Responsible Investment (PRI) which aim to integrate environmental, social and governance (ESG) issues into investment decision-making and ownership practices.[49]

The concept of social performance (SP) is the operationalization of CSR in managerial context (Carroll, 1979, 1999; Wood, 1991; Waddock and Graves, 1997). For example, according to MSCI ESG STATS[50], SP includes several dimensions such as Community, Diversity, Employee relations, Environment, Product, Human Rights and Corporate Governance. Most empirical CSR research has focused on the relationship between SP and financial performance (FP), however with mixed results (Margolis and Walsh, 2003; Orlitzky et al., 2003; Mattingly and Berman, 2006; Baron *et al.,* 2011). These studies do not provide a general consensus about whether SP is value enhancing, reducing or irrelevant. From a financial point of view, SP can affect firm value (performance) *if and only if* it affects expected future cash flows and/or risk. Studies focusing on FP (or value) cannot distinguish between the expected cash-flows effect and the risk effect. This paper focuses on the risk effects associated with SP. This is important because studies examining the relation between SP and risk are sparse and problematic (Oikonomou et al. 2012). There is little to no research focusing on the relation between SP and idiosyncratic risk (Lee and Faff, 2009). While these few studies (see e.g., Orlitzky and Benjamin, 2001) have contributed to our understanding of

[49] http://www.unpri.org/

[50] MSCI ESG STATS (former KLD Research & Analytics, Inc). For simplicity, we use the KLD abbreviation.

this relationship, they have several limitations which invite further research. For example, what is the impact of the different dimensions of SP on the firm's idiosyncratic risk? This important question has not been addressed by previous studies. Our study will fill this gap.

Some studies argue that SP affects only systematic risk based on the main insight of portfolio theory, that is only systematic risk is priced in financial markets, whereas others suggest that SP affects only idiosyncratic risk because SP is firm specific. For example, Boutin-Dufresne and Savaria (2004) and Lee and Faff (2009) find a negative relationship between idiosyncratic risk and aggregate measure of SP (using the Canadian Social Investment Database (CSID) and Dow Jones Sustainability Index (DJSI), respectively). Luo and Bhattacharya (2009) find a negative relationship between idiosyncratic (systematic) risk and aggregate measure of SP based on *Fortune*'s Most Admired Companies in 2002 and 2003. Goss (2012) find that higher aggregate concerns are related to higher volatility of unexpected earnings and discount rates, whereas higher aggregate strengths are associated with lower idiosyncratic variance. He concludes that concerns are more value relevant than strengths. The only identified study that examines the impact of one SP dimension on the idiosyncratic risk is that of Bauer et al. (2009). They construct an employee relations index (strengths minus concerns of Employee Relations and Diversity dimensions of KLD), and find that firms with stronger employee relations have lower cost of debt, higher credit ratings, and lower idiosyncratic risk (residual volatility from CAPM). Other studies examine the relation between SP and systematic risk. Salama et al. (2011) find a negative relationship between systematic risk and a measure of SP which combines two dimensions (community and environment). Oikonomou et al. (2012) find a negative (positive) relation between systematic risk and a measure of aggregate strengths (concerns) for S&P 500 firms. They also find that community, employment, and environmental concerns are significantly and positively related to systematic risk. However, limiting the sample coverage to only S&P 500 firms could introduce a size bias in their results.

With some exceptions, most previous studies have used aggregate measures of SP combining strengths (positive actions) and/or concerns (negative actions) of several dimensions which are not equally important for a specific firm or investor. There are two drawbacks associated with the use of composite (aggregate) measures of SP. First, combining

all of the SP dimensions into aggregate measures of SP may confound the effects of the individual dimensions of SP that are not equally important and relevant (Griffin and Mahon, 1997; Johnson and Greening, 1999). This suggests that we should consider the individual dimensions of SP separately (Hillman and Keim, 2001; Rehbein *et al.,* 2004). Second, Mattingly and Berman (2006) argue that positive and negative social actions (i.e., strengths and concerns as assessed by KLD) are both empirically and conceptually distinct constructs and should not be combined. Specifically, they find that KLD strengths and concerns for a particular dimension do not covary in opposite directions (i.e., they do not measure opposing sides of the same underlying construct). It is also important to distinguish between strengths and concerns because there could be compensation effects. In summary, prior research highlights the importance of distinguishing between aggregate SP measures and disaggregated SP measures at two levels: (1) individual dimensions of SP; and (2) strengths and concerns within each individual dimension of SP.

The objective of this paper is to examine the impact of the individual dimensions of SP on firm risk. We use individual dimension measures of SP which first combine and then separate strengths and concerns. To the best of our knowledge, our study is the first to provide a comprehensive assessment of the effects of SP dimensions on firm's idiosyncratic risk.[51]

The contributions of this article are threefold. First, our study explicitly quantify the risk effects associated with SP dimensions which allows better understanding of the risk implications of SP for investors, corporate managers and policy makers. For example, if the risk effect of SP is significant statistically and economically it would be rational for firm's managers to improve their SP and integrate it into their overall strategy. We provide a direct test of the risk management hypothesis or risk mitigation view, i.e., SP have an insurance effect, using a large panel of US firms covering the period 1991-2007. The insurance effect suggests that firms use SP to control risk which is consistent with a large literature on why firms hedge as a means to reduce cash flows volatility and costs of financial distress, among

[51] There are two main differences between our study and those of Goss (2012) and Bauer *et al.* (2009). First, Goss (2012) focus is on aggregate SP measures of strengths and concerns, whereas our focus is on individual measures of strengths and concerns of SP dimensions. Second, Bauer *et al.* (2009) examine only one SP dimension (an index combining strengths and concerns of employee and diversity), whereas we examine all SP dimensions covered by KLD.

other things (e.g., see Stultz, 2002). Prior research show that risk management is value relevant because of market imperfections (Stultz, 2002). Therefore, risk management of social, environmental and governance issues, which is equivalent to strategic risk management (Sharfman and Fernando, 2008), can be priced in financial markets.

Second, we examine the relation between the individual dimensions of SP and a firm's total and idiosyncratic risks. Based on theoretical arguments and empirical evidence(e.g., Heinkel *et al.,* 2001; Barnea *et al.,* 2005; Mackey et *al.,* 2007; Fama and French, 2007), we hypothesize that SP will affect idiosyncratic risk which is priced in financial markets because of the "neglect effect" (i.e., the presence of investors with tastes for assets as consumption goods). SP is likely to have an influence on the idiosyncratic risk because the implications of SP actions and practices (e.g., employee commitment and effort, lawsuits, strikes, fines, reputational risk, boycotts) are mainly firm-specific in nature (Lee and Faff, 2009; Bauer et al., 2009). Prior research show that idiosyncratic risk is priced in financial markets (see e.g., Goyal and Santa-Clara, 2003; Ang *et al.,* 2006; Fangjian, 2009) more likely because of market imperfections (e.g., limited arbitrage, investors' limited ability to fully diversify their portfolios, constraints on market participations, etc.).

Third, we show that there is heterogeneity in the SP-risk relation. Our main point is based on the premise that different dimensions of SP may have different effects on firm risk. Specifically, we propose that only some SP dimensions will affect significantly firm risk based on three arguments. The first argument suggests that some SP dimensions are objectively measurable and more agreed upon within the investment community relative to other SP dimensions which are sensitive to subjective interpretation (Derwall and Verwijmeren, 2007). The second argument is based on the empirical evidence suggesting that investors are not homogeneous and do not behave in the same manner with regard to SP dimensions (e.g., Berman *et al.,* 1999; Barnett and Salomon, 2006; Brammer *et al.,* 2006; Derwall and Verwijmeren, 2007; Bird *et al.,* 2007; Scholtens, 2008; Godfrey *et al.,* 2009; Oikonomou *et al.,* 2012). The third argument that could explain the heterogeneity in the SP-risk relation is to recognize that SP is multidimensional and the various SP dimensions may have differential impacts depending on the nature of the firm's business (Brammer *et al.,* 2006).

This paper examines the impact of the individual dimensions of SP on firm's risk (total and idiosyncratic) using a large panel dataset of 16,599 firm-year observations over the period 1991-2007. We observe that members of the S&P500 index are larger firms, less risky, highly visible for media and analysts suggesting that they have more transparency practices regarding their SP actions and impacts. Therefore, we argue that S&P500 firms have less information asymmetry relative to non S&P500 firms regarding SP information, and consequently the relation between firm's risk and strengths and concerns of SP dimensions is more pronounced for S&P500 firms relative to non S&P500 firms. To test this idea, we divide the whole sample into two groups based on S&P500 membership. Our result is consistent with this conjecture.

In an initial analysis, we focus on measures of SP dimensions which combine strengths and concerns. We find that not all SP dimensions are relevant for firm risk. For the whole sample, only two dimensions (Employee relations and Human Rights) are negatively related to firm risk. When splitting the sample based on S&P500 membership, we find that Employee relations, Corporate Governance and Community negatively affect firm risk, whereas Environment positively affects firm risk for S&P500 firms. For non S&P500 firms, only Employee relations, Community and Environment affect negatively firm risk. The other dimensions (Diversity, Human Rights, and Product) do not impact significantly firm risk for both subsamples. We subsequently focus our analysis on measures of SP dimensions which separate strengths and concerns. We draw two main conclusions from our analysis for the whole sample. First, Employee, Diversity, Corporate Governance and Human Rights concerns positively affect firm's risk. Second, Diversity and Corporate Governance strengths positively affect firm's risk. When splitting the sample based on S&P500 membership, we find that Employee relations, Diversity and Corporate Governance concerns positively affect firm's risk, whereas Community (Diversity) strengths negatively (positively) affect firm's risk for S&P500 firms. For non S&P500 firms, Employee relations concerns and Diversity strengths positively affect firm's risk, whereas Environment strengths negatively affect firm's risk. Finally, we examine whether there is a casual link between firm's risk and strengths and concerns of SP dimensions. We find that the direction of causation tend to vary along the

different SP dimensions. There is some bidirectional causality as well as some unidirectional causality in both directions.

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework and research hypotheses. Section 3 describes the data and sample selection procedure. Section 4 describes the methodology used in order to test our hypotheses and section 5 presents and discusses our empirical results. Section 6 concludes and provides avenues for future research.

2.2. Theoretical framework and research hypotheses

2.2.1. Social performance and idiosyncratic risk

In the absence of market imperfections, the main insight of portfolio theory is that rational investors will hold well diversified portfolios, and that only systematic risk is priced because idiosyncratic risk can be eliminated through diversification. Accordingly, most asset pricing models suggest that the expected return of an asset is a function of its systematic (i.e., undiversifiable) risk only. A common assumption in asset pricing models is that investors choose asset holdings based solely on anticipated payoffs, that is, investment assets are not also consumption goods (Fama and French, 2007). Investment decisions based on SP, i.e., tastes for assets as consumption goods, is an apparent violation of this assumption. Investment decisions based on SP is a form of tastes for assets as consumption goods that are unrelated to returns (Fama and French, 2007). In other words, socially responsible investors get direct utility above and beyond the utility from general consumption that the payoffs on the assets provide.[52] Fama and French (2007) show that the tastes for assets as consumption goods can affect asset prices, and the distortions of expected returns (i.e., deviation from the asset pricing model) can be large when investors with asset tastes account for substantial invested wealth and / or have tastes for a wide range of assets.

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[52] Traditional investors evaluate assets based solely on payoffs and thus the access to overall consumption they provide (Fama and French, 2007). They have no tastes for specific assets as consumption goods.

Theoretical models of the relationship between SP and expected returns (e.g., Heinkel *et al.,* 2001; Barnea *et al.,* 2005; Mackey *et al.,* 2007) relax the assumption of the perfect capital market by assuming differences in investor preferences (i.e., segmented capital market based on SP). These models assume the existence of two types of investors in the financial markets: traditional investors and socially responsible investors. Traditional investors consider only financial criteria (risk and return) in their investment decisions, whereas socially responsible investors consider both financial and non-financial criteria (e.g., SP). The general prediction of these models is the "neglect effect" caused by SP. That is, there will be an excess demand for socially responsible stocks suggesting that they will be overvalued (leading to lower risk and expected return). At the same time, there will be a weak demand for socially irresponsible stocks suggesting that they will be undervalued (leading to higher risk and expected return) because investors require additional premiums as a compensation for the lack of risk sharing opportunities.

A similar prediction on neglected stocks and segmented markets is derived from the equilibrium model with incomplete information developed by Merton (1987). Because of the "neglect effect" or the limited risk sharing, Merton (1987) shows that the CAPM no longer holds and that idiosyncratic risk matters for pricing (Hong and Kacperczyk, 2009). Specifically, Merton (1987) model predict a positive relation between idiosyncratic risk and expected return when investors do not diversify their portfolio (Fangjian, 2009). Hong and Kacperczyk (2009) provide empirical evidence consistent with the "neglect effect" caused by SP. They show that "sin" stocks, i.e., tobacco, alcohol and gambling stocks, have higher expected return (risk) because they are neglected by social norm-constrained institutional investors such as pension funds. The model of Merton (1987) is consistent with the argument that the market values the risk management and transparency practices associated with SP (Lee and Faff, 2009).

The theoretical models of the relationship between SP and expected returns (e.g., Heinkel *et al.,* 2001; Barnea *et al.,* 2005; Mackey *et al.,* 2007; Fama and French, 2007) suggest that firm-specific (idiosyncratic) risk attributable to SP can be priced in financial markets because of the "neglect effect" (i.e., the presence of investors with tastes for assets as consumption goods). SP is likely to have an influence on the idiosyncratic risk because the implications of SP actions and practices (e.g., employee commitment and effort, lawsuits, strikes, fines, reputational risk, boycotts) are mainly firm-specific in nature (Lee and Faff, 2009; Bauer *et al.,* 2009). Prior research show that idiosyncratic risk is priced in financial markets (see e.g., Goyal and Santa-Clara, 2003; Ang *et al.,* 2006; Fangjian, 2009) more likely because of market imperfections (e.g., limited arbitrage, investors' limited ability to fully diversify their portfolios, constraints on market participations, etc.). For example, Shleifer and Vishny (1997) show that arbitrage is limited because it can be costly and risky.

Based on these theoretical arguments and empirical evidence, we hypothesize that SP will affect idiosyncratic risk. Higher SP protect against firm-specific (negative) shocks, i.e., higher SP reduces the sensitivity of the firm's performance to these shocks (e.g., litigation risk; reputational harm due to boycott or product recall; fines and penalties due to poor environmental records). Negative firm-specific event will affect less (more) the performance and reputation of the firm with high (low) SP because stakeholders (e.g., investors, employees and customers) will be supportive and loyal.

Table 2.1 shows several theoretical arguments explaining why SP could relate to firm-specific (idiosyncratic) risk. The arguments involve SP theories (the stakeholder theory, the slack resources theory), and finance theories (the risk management theory, the Merton (1987) argument on investor recognition or the size of a firm's investor base, and the managerial opportunism theory).

Table 2.1: Theoretical relations between SP and idiosyncratic risk

Theory	Rational	SP	Strengths	Concerns
Stakeholder theory	Good management	-	-	+
Slack resources theory	Funds availability	-	-	+
Risk management	SP as insurance mechanism	-	-	+
Merton (1987) argument on investor recognition	Size of firm's investor base; investor preferences	-	-	+
Managerial opportunism theory	SP as private benefits	+	+	+

First, the stakeholder theory predicts that higher (lower) SP will reduce (increase) firm risk through reduced (increased) financial and operating risks (McGuire *et al.,* 1988), as well as social and environmental risks (Feldman *et al.,* 1997; Sharfman and Fernando, 2008). Also, SP may reduce asymmetric information if it is considered as a signal of management quality (McGuire *et al.,* 1988; Waddock and Graves, 1997). Investors may perceive firms with higher (lower) SP as less (more) risky. For example, higher SP may induce investors to perceive the firm as being less prone to social crises, and having better future positioning to be in compliance with more stringent regulations in social domains (e.g., environment). Second, the slack resources theory suggests that availability of resources, due for example to higher past financial performance, provide the firm with the opportunity to make CSR investments thereby improving their SP (McGuire *et al.,* 1988; Waddock and Graves, 1997), and potentially reduce their expected risk.

Third, the management of social and environmental risks also suggests a negative relationship between firm risk and SP. That is, higher (lower) SP can lead to lower (higher) firm risk. Risk management implies the identification of the risk sources, the assessment/measurement of these risks, control and mitigation of these risks to reduce their impact on overall firm performance (Alexander and Sheedy, 2004). Sharfman and Fernando (2008) show that improved environmental risk management (e.g., emissions and pollution reduction) reduce the probabilities of environmental crisis that could negatively affect a

firm's expected cash flows (e.g., lawsuits, clean-up costs in the case of environmental accidents, potential fines and damage to reputation). CSR investments can generate moral capital or goodwill which provides insurance-like protection that mitigate the impact on firm's cash flows in the event of crisis or negative events about the firm (Godfrey *et al.,* 2009). The risk management hypothesis or risk mitigation view, i.e., SP have an insurance effect suggests that firms use SP to control risk which is consistent with a large literature on why firms hedge as a means to reduce cash flows volatility and costs of financial distress, among other things (e.g., see Stultz, 2002). Prior research show that risk management is value relevant because of market imperfections (Stultz, 2002). Therefore, risk management of social, environmental and governance issues, which is equivalent to strategic risk management (Sharfman and Fernando, 2008), can be priced in financial markets.

Fourth, the Merton (1987) argument on investor recognition or the size of a firm's investor base also suggest a negative relationship between SP and firm risk. The model of Merton (1987) suggests price differences induced by demand differences for different types of stocks. In particular, the model predicts that the firm's risk decreases as the number of its shareholders increase. If firms with higher SP tend to have greater investor bases, then these firms will have lower risk. Similarly, if firms with lower SP tend to have smaller investor bases, then these firms will have higher risk.

Finally, the "managerial opportunism hypothesis" (Preston and O'Bannon, 1997) suggests a positive relationship between SP and firm risk. Managers may over-invest in CSR activities for their private benefit (i.e., to improve their reputations as good social citizens), even at the expense of shareholders (Barnea and Rubin, 2010). Cespa and Cestone (2007) show that managers can strategically commit themselves to a socially responsible behavior to gain stakeholders' support (e.g., social and environmental activists), thereby reducing the likelihood of their replacement through takeovers. Therefore, managers' relations with stakeholders other than shareholders (e.g., connections with local communities, NGOs, unions, and politicians) may become an effective entrenchment strategy. According to the managerial opportunism hypothesis, we would expect that the firm will be perceived as more risky because of managerial entrenchment, and consequently SP is expected to be positively

related to firm risk. The argument is that the higher risk is not rewarded by investors so that SP is value reducing.

2.2.2. Heterogeneity in the SP-risk relation

The theories shown in Table 2.1 suggest that the firm's idiosyncratic risk is expected to be related to SP. Does this relation holds regardless of which individual dimension of SP is being considered? Since SP is a multidimensional construct which includes several dimensions, it is not obvious whether the expected impacts on risk predicted by these theories hold regardless of the SP dimension considered. Assuming that these theories will apply uniformly for each SP dimension is equivalent to assuming that investors are homogenous with respect to SP dimensions (e.g., homogenous beliefs about the definition of SP and its implementation in investment decisions) which in turn are assumed objectively measurable and agreed upon. The aggregate SP of a firm is the combination of its performance relative to several dimensions (Environment, Employee, Product, etc.). Firm's performances in each of these dimensions are not necessarily the same (e.g., the firm may have a strong performance in one dimension and poor performances in other dimensions). It is also possible that the firm can have good (or bad) performances relative to several dimensions. To illustrate, the KLD dataset in the year 2007 shows that Walt Disney Company exhibited strong performances along Diversity (4 strengths) and Environment (one strength), but weak performances along the Employee Relations (3 concerns), Corporate Governance (2 concerns), Product (one strength and 2 concerns), and Human Rights (one concern).

In this study, we argue that there is heterogeneity in the SP-risk relation. Our main point is based on the premise that different dimensions of SP may have different effects on firm risk. Specifically, we propose that only some SP dimensions will affect significantly firm risk. Three arguments can support this idea. First, some SP dimensions are objectively measurable and more agreed upon within the investment community relative to other SP dimensions which are sensitive to subjective interpretation (Derwall and Verwijmeren, 2007). In other words, only SP dimensions that are least ambiguous, most easily measured, and most agreed upon within the investment community will affect significantly firm risk. Second, the

empirical evidence suggest that investors are not homogeneous and do not behave in the same manner with regard to SP dimensions (e.g., Berman *et al.,* 1999; Barnett and Salomon, 2006; Brammer *et al.,* 2006; Derwall and Verwijmeren, 2007; Bird *et al.,* 2007; Scholtens, 2008; Godfrey *et al.,* 2009; Oikonomou *et al.,* 2012). Berman et al. (1999) find that only two dimensions (employees and product) directly affect financial performance after controlling for firm strategy and operating environment. Brammer *et al.* (2006) examine the impacts of SP dimensions on stock returns for a sample of UK firms. They find that returns are negatively related to environment and community, but weakly positively related to employee. They conclude that the various SP dimensions must be examined separately in order to achieve an accurate picture of their impacts on returns. Derwall and Verwijmeren (2007) find that the cost of equity is negatively related to three SP dimensions (environment, governance and product), and positively related to a social index including diversity, human rights, employee relations and community. Derwall and Verwijmeren (2007) argue that the three SP dimensions (environment, governance and product) are the more relevant for investors based on the empirical evidence about investor preferences and institutional ownership. El Ghoul *et al.* (2011) find that only environment, employee relations and product are negatively related to the cost of equity capital.

The third argument that could explain the heterogeneity in the SP-risk relation is to recognize that SP is multidimensional and the various SP dimensions may have differential impacts depending on the nature of the firm's business (Brammer *et al.,* 2006). SP dimensions are heterogeneous. For example, community and environment are different kinds of social activities, not merely different degrees of the same social activity because they are subject to a different set of motivations and drivers (Godfrey *et al.,* 2008). Moreover, social issues differ by industry as each industry has different configurations of stakeholders with disparate degrees of activism on the issues (Carroll, 1979; Griffin and Mahon, 1997). Some capital-intensive industries (e.g., the so-called "dirty industries", such as coal, chemical and petroleum and natural gas) appear to be more exposed to environmental issues than other industries. Environmental performance may be more important in these industries due to their higher environmental impacts. Employee relations and human rights issues may be the most important SP dimensions in labor-intensive industries (e.g., footwear, apparel, and toy) which

have been heavily targeted in the mid-1990s for human rights violations and non-adherence to global labor standards (Rivoli, 2003).

Because SP dimensions are heterogeneous, one would expect different relationships between the firm's risk and the SP dimensions. In other words, SP dimensions do not affect firm risk uniformly in the sense that some of them significantly affect firm risk, whereas others do not. In particular, the theories shown in Table 2.1 are likely to apply only to some SP dimensions, namely employee relations, Environment, product and corporate governance. Based on the empirical evidence reported in previous studies, these SP dimensions seem more relevant for investors in the sense that they are objectively measurable and more agreed upon within the investment community. They also seem more relevant for firms as indicated by the recent survey of CEOs who consider that consumers and employees are the most important stakeholder groups that will impact the way firms' manage societal expectations (Lacy *et al.,* 2010). This leads to our first hypothesis (stated in the alternative form):

H_1^A: Only some SP dimensions (Employee relations, Environment, Product and Corporate governance) affect significantly firm risk.

The measure of a specific dimension of SP is the difference between strengths and concerns of that dimension. This measure can be positive (negative) if strengths are higher (lower) than concerns. This measure can also be null if the firm has the same number of strengths and concerns (i.e., the firm exhibits both strong and weak performance along the same SP dimension). To illustrate, the KLD dataset in the year 2007 shows that Kimberly-Clark Corporation exhibited two Employee Relations strengths (employee involvement and Health and Safety Strength), but at the same time two Employee Relations concerns (Health and Safety Concern and Pension/Benefits Concern). Godfrey *et al.* (2008) argue that positive (e.g., strengths) and negative (e.g., concerns) social actions and impacts must remain distinct because the process of netting a firm's positive and negative social actions and impacts (i.e., difference between strengths and concerns) obscures more than it reveals. This suggests that we should examine the impact of strengths and concerns on firm risk separately.

As shown in Table 2.1, all the theories predict a positive relation between the concerns and the firm's risk. The intuition behind is that it is more likely that both socially responsible investors as well as traditional investors will be affected by the concerns suggesting that their impact on firm risk may be significant. Concerns such as fines due to substantial emissions, investment controversies within communities in which the firms operate, health and safety concerns, product recalls or human rights violations will probably affect equally both types of investors. These concerns are more likely to affect investors' expectations about cash flows, e.g., through increased risk of boycott and damage to firm brand and reputation as a result of negative campaign by media and NGOs. Consequently, at least some of the concerns will significantly affect firm risk because they affect all investors (socially responsible investors and traditional investors). It follows that firms involved in socially irresponsible activities will be exposed to a higher risk. For example, Oikonomou *et al.* (2012) find that community, employee and environment concerns are positively related to systematic risk (market beta) for S&P 500 firms.

Bauer *et al.* (2009) argue that the quality of employee relations can affect the level and volatility of expected cash flows, and mitigate the litigation and reputation risks associated with the harmful behavior of dissatisfied employees. For example, poor employee relations signal a management's lack of commitment to its employees and their claims, which reduce employees' commitment and their loyalty to the firm (e.g., reductions in the firm's productivity and innovation, limit firms' access to human capital, exit of valuable employee). Poor employee relations can result in costly litigations (e.g., damages and legal fees), reputation loss and higher transaction costs (Bauer *et al.,* 2009). Kane *et al.* (2005) argue that good employee relations build economic goodwill in the form of cooperation and trust between management and employees. Such goodwill decreases the risk of financial distress because the firm can obtain temporary concessions from their employees (e.g., reduced wages and employee benefits) in the event that adverse economic conditions occur. Conversely, if employee relations are poor, it follows that such concessions will be more difficult to obtain. They find empirical evidence consistent with this conjecture.

According to Bauer *et al.* (2009), KLD dimensions that relate to the management of human capital are diversity and employee relations. Human rights issues could also relate to the management of human capital. Consequently, we expect employee, diversity, and human rights concerns to be positively related to the firm's idiosyncratic risk. We also expect corporate governance concerns to be positively related to the firm's idiosyncratic risk. Dhaliwal *et al.* (2010) document a substantial increase over time in stand-alone CSR reporting made by firms which they attribute to investor awareness of the relevance of information related to CSR and the increased scrutiny of firms for dubious accounting practices and ineffective corporate governance following major corporate scandals. The risk associated with weaker corporate governance can be priced when we apply the Merton (1987) reasoning if investors neglect weakly governed firms because of ethical reasons (Derwall and Verwijmeren, 2007).

Unlike the concerns, we expect that the impact of the strengths on firm risk is not uniform and depends on the SP dimension. In other words, the strengths of some SP dimensions will be negatively related to firm risk, whereas the strengths of other SP dimensions will be positively related to firm risk. It is also possible that the strengths of some SP dimensions will not affect significantly firm risk. This might be attributable to the fact that market participants (e.g., investors and analysts) do not agree yet on the value of the strengths and their impacts. For example, Ioannou and Serafeim (2010) find that firms with higher aggregate strengths receive more favorable analysts' recommendations in recent years (positive) relative to earlier ones (negative) which reflect a changing perception of the value of CSR strategies by analysts. Moreover, Edmans (2011) shows that the stock market does not fully value intangibles (e.g., employee satisfaction), even when independently verified by a publicly available survey. Godfrey *et al.* (2009) find that community and diversity strengths have an insurance effect, whereas governance, employee and product strengths do not have such benefits. Community and diversity strengths are considered as institutional SP activities targeting a firm's secondary stakeholders or society at large, while governance, employee and product strengths are considered as technical SP activities targeting a firm's trading partners. According to Godfrey *et al.* (2009), only institutional SP (i.e., community and diversity strengths) should affect significantly firm risk. Diversity strengths may create cost savings for

the firm (e.g., reduce absenteeism and turnover), enhance its productive capabilities (e.g., attract the best talent from the labor pool), and expand its markets (Berman *et al.,* 1999). Community strengths might help the firm reducing its costs through tax advantages, reduced regulation, and a better local workforce quality over the long term (Waddock and Graves, 1997).

Most of the theories shown in Table 2.1 (the stakeholder theory, the slack resources theory, the risk management theory and the Merton (1987) argument on investor recognition) suggest a negative relation between the strengths and firm risk. Based on the results of previous studies showing that improved environmental performance reduces the firm's cost of equity (e.g., Feldman *et al.,* 1997; Sharfman and Fernando, 2008; El Ghoul *et al.,* 2011), environment strengths is expected to be negatively related to firm risk. Because of the increased attention of the financial community to the environmental dimension, it is possible that investors perceive firms with environment strengths as less risky investments. For example, high environment strengths can lower the costs of complying with present and future environmental regulations, improve firm efficiencies and reduce operating costs (Berman *et al.,* 1999). They can also improve the firm's image and enhance the loyalty of key stakeholders such as customers, employees, and government (Berman *et al.*, 1999).

A positive relation between the strengths and firm risk could be explained by the managerial opportunism hypothesis in which managers may over-invest in CSR activities (i.e., strengths) for their private benefit (i.e., to improve their reputations as good social citizens and to gain stakeholders' support), even at the expense of shareholders (Barnea and Rubin, 2010; Cespa and Cestone, 2007). This could suggest a positive relation between corporate governance strengths and firm risk. It is important to note that KLD strengths and concerns for corporate governance differ from governance measures generally used in the literature (see e.g., Jo and Harjoto, 2012). Our definition of corporate governance in this study is the same as KLD definition which include compensation, ownership, accounting, political accountability, and transparency. Since this information is available among the SP dimensions, we assume that investors use it to discriminate between firms based on the above definition. It is possible that the average investor is unable to fully evaluate the financial impacts of these governance indicators, so that he or she considers that corporate governance

strengths as defined by KLD are manifestation of managerial entrenchment, and consequently he or she associates them with higher risk.

Since the strengths and concerns are conceptually distinct constructs (Mattingly and Berman, 2006) and are subject to different dynamics (McGuire *et al.,* 2003), we examine their impact on firm risk separately. This leads to our second and third hypothesis stated in their alternative forms:

H_2^A: The relation between the strengths of some SP dimensions (e.g., environment) and firm risk is negative, whereas this relation is positive for other SP dimensions (e.g., corporate governance).

H_3^A: The relation between the concerns of some SP dimensions (employee relations, diversity, human rights and corporate governance) and firm risk is positive.

2.3. Data and sample selection

We obtain social performance data for U.S. firms from the MSCI ESG STATS (formerly KLD Research & Analytics, Inc (KLD)). This database covers approximately 650 firms from 1991 to 2000, 1100 firms in 2001 and 2002, and 3100 firms from 2003 to 2007. Each firm is rated on the basis of exclusionary and qualitative screens. *Strength* and *Concern* ratings are provided for several indicators of seven qualitative screens as well as *Concern* ratings for several indicators of six exclusionary screens. KLD ratings reflect data at calendar year end. The seven qualitative screens are Community, Diversity, Employee relations, Environment, Product, Human Rights (*"non-US operations"* before 2002), and Corporate Governance (*"Other"* before 2002). The six exclusionary screens are Alcohol, Gambling, Firearms, Military, Nuclear power, and Tobacco.

The qualitative screen indicators include both positive and negative ratings (i.e., strengths and concerns), whereas the exclusionary screens only include negative ratings (i.e., concerns). The KLD database attributes a value of one to each concern or strength, if any, and zero otherwise. KLD made several changes in its database during the sample period. For example, the "Human Rights" dimension had only concerns before 1994. Although some

studies have criticized certain aspects of the KLD data (e.g., Chatterji et al., 2009), the KLD database is the most comprehensive and widely-used source of data for CSR research (Mattingly and Berman, 2006; Harjoto and Jo, 2011). This provides a certain credibility and legitimacy to this database. According to Waddock (2003, p. 371), "*KLD's database has proven itself to be factual, reliable, broad-ranging, and maintained with consistency and transparency over the past decade*".

The final sample is an unbalanced panel of 16,599 firm-year observations over the period 1991-2007 for all non-financial and utility firms covered by four databases: MSCI ESG STATS (KLD), Thomson Reuters I/B/E/S for analyst earnings forecasts; CRSP for stock prices, stock returns, trading volumes, and shares outstandings; and COMPUSTAT for accounting data.

2.4. Methodology

2.4.1. Measuring social performance

We follow previous studies by not considering the exclusionary screens (e.g., Hillman and Keim, 2001; Oikonomou *et al.,* 2012).[53] Since we already control for industry, the inclusion of these screens may introduce noise because they tend to be industry-specific (e.g., Alcohol, Military, and Tobacco). More importantly, exclusionary screens are conceptually different from qualitative screens (Hillman and Keim, 2001). Herein, we use individual dimension measures of SP which first combine and then separate strengths and concerns for each qualitative dimension.[54]

We follow previous studies (e.g., Harjoto and Jo, 2008; Oikonomou *et al.,* 2012) in computing for each SP dimension an average measure, (COMMUNITY, DIVERSITY, etc), which is equal to the difference between the average strength and average concern within a given SP dimension for each year. For each firm-year observation, we compute separate

[53] The number of observations different from zero does not exceed 1% of total observations for all exclusionary screens, except military for which 7.58% of the observations are different from zero.
[54] The results are similar using the sum instead of the average of these measures.

average strength and concern scores for each SP dimension, where STR_COM (CON_COM) and STR_DIV (CON_DIV) refer to community strengths (concerns), diversity strengths (concerns), and so on. The average strength (concern) score is equal to the total number of strengths (concerns) divided by the total maximum possible numbers of strengths (concerns), within a given SP dimension for each year. To illustrate, the individual dimension measure of COMMUNITY is equal to the difference between STR_COM and CON_COM. The average strength and concern scores for each SP dimension (i.e., STR_COM, CON_COM, STR_DIV, CON_DIV, etc) allow us to test hypotheses 2 and 3, whereas the individual dimension measures of SP (i.e., COMMUNITY, DIVERSITY, etc) allow us to test hypothesis 1.

2.4.2. Measuring firm risk

In this paper, we use total firm risk and its idiosyncratic component. Total risk is measured by the annualized standard deviation from the monthly stock returns over the previous five years and from daily stock returns over the past year. Idiosyncratic (unsystematic) risk is measured as the standard deviation of the residuals from the standard CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model using the previous year daily excess returns. The latter model is given by the following equation:

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \beta_{iu}UMD_t + \varepsilon_{it} \qquad (1)$$

R_{it} is the return of firm i for month t. R_{ft} is the risk-free rate (1-month Treasury-bill rate). $(R_{Mt} - R_{ft})$ is the excess return on the market portfolio (CSRP value-weighted index) for month t. SMB_t is the difference between the returns on portfolios of "small" and "big" capitalization stocks for month t. HML_t is the difference between the returns on portfolios of "high" and "low" book-to-market stocks for month t. UMD_t is the difference between the returns on portfolios of high and low prior return stocks. ε_{it} is the stochastic error term, assumed to be IID normal with mean zero and constant variance $\sigma^2_{\varepsilon_i}$. The CAPM only

includes the market factor, whereas the three-factor Fama and French (1993) model adds to the market factor the SMB_t and HML_t factors.[55] For each-firm-year observation, we use daily excess returns over the previous year to estimate idiosyncratic risk using time series regressions. This process is repeated for each of the 17 years of the sample period, so that we get time-varying idiosyncratic risk.

2.4.3. Multivariate framework

To examine the cross-sectional relation between firm risk and social performance dimensions, we run the following regressions:

$$Risk_{it} = \alpha + \sum_{d=1}^{D} \beta_d SP_{idt-1} + \delta X_{it-1} + \varepsilon_{it} \quad (2)$$

$$Risk_{it} = \lambda_0 + \sum_{d=1}^{D} \beta_{sd} STR_{idt-1} + \sum_{d=1}^{D} \beta_{cd} CON_{idt-1} + \delta X_{it-1} + \varepsilon_{it} \quad (3)$$

where $Risk_{it}$ is the risk measure for firm i at time t, and SP_{idt-1} is the individual dimension measures of SP for firm i relative to dimension d (i.e., COMMUNITY, DIVERSITY, etc) at time $t-1$. STR_{idt-1} (CON_{idt-1}) are the strengths (concerns) measures for firm i relative to dimension d at time $t-1$. X_{it-1} is a vector of firm-specific characteristics, industry factors, and economic or market-wide factors that affect the firm's risk. δ is the vector of the related regression coefficients. The significance of the coefficients β_d, β_{sd}, and β_{cd}, respectively, reveals whether a relationship exists between the social performance dimensions and the firm's risk measure.

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[55] The factors (SMB_t, HML_t and UMD_t) are obtained from Kenneth French's web site (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

Since our focus is on the cross-sectional relation between levels of the variables, we estimate equations (2) and (3) using pooled cross-section time-series regressions and control for industry and year fixed effects. We include industry dummy variables to control for industry fixed effects, which may affect the relation between firm risk and social performance dimensions. There is empirical evidence suggesting that a firm's risk varies by industry (Fama and French, 1997; Gebhardt *et al.*, 2001). Industry dummy variables are based on the Fama and French (1997) industry classification. We also include dummy variables for each year in our sample period (i.e., year-fixed effects) to control for changing economic conditions or the market-wide effects on the firm's risk[56]. Standard errors are adjusted for both heteroskedasticity and clustering of observations. Specifically, we use the two-way cluster robust standard error approach of Petersen (2009). This approach allows for correlations among different firms in the same year and different years in the same firm (Petersen, 2009). Since SP variables do not vary much over time, then it is important to adjust the standard error to both firm and time effects. Therefore, our models are estimated with clustering on two dimensions (firm and time). Moreover, all our regressions are estimated after standardizing all variables by their standard deviations, so we can interpret the economic significance of the coefficients directly.

Based on theoretical arguments and empirical evidence,[57] the firm-specific characteristics considered in this paper are firm size, Book-to-Market (B/M) ratio, net leverage, expected return, stock liquidity, dispersion of analyst forecasts, investment-to-asset ratio, expected growth in earnings, and default risk. Firm size (lnmkteq) is proxied by the logarithm of the market value of common equity at the most recent fiscal year end prior to the measurement date of our risk measures to account for the highly skewed nature of this variable. Book-to-Market (B/M) ratio (bmw) is computed as the ratio of the book to market value of common equity as of the most recent fiscal year end. We follow Bates *et al.* (2009) and use net leverage (netlevw) which is measured as the ratio of long-term debt minus cash & marketable securities to the market value of common equity using values for the most recent fiscal year

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[56] We also considered the inclusion of a macro variable (market volatility) as an additional control, but it is always omitted in the regression because of multicollinearity with the year dummies.

[57] See, for example, Fama and French (1992, 1993), Brennan *et al.* (1998), Berk *et* al. (1999), Carlson *et al.* (2004, 2006), Gebhardt *et al.* (2001), Chordia *et al.* (2001), and Botosan and Plumlee (2005).

end. We use the annualized return from the previous year's daily stock returns to proxy for expected return (ret1y). The level of stock liquidity is proxied by the average daily share turnover (avgturnover), and the liquidity risk is proxied by the coefficient of variation of this measure (cvturnover) over the previous year. Share turnover is defined as daily shares traded divided by daily shares outstanding.

We use two variables to control for cash flow risk. The first is the dispersion of analyst forecasts measured by the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w). The second variable is the standard deviation of the return on assets (ROA) over the previous five years (sdroa5yw). Investment-to-asset ratio (investment) is computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets. We use the mean annualized five-year earnings growth rate from I/B/E/S (where available, otherwise estimated as the implicit growth in forecasted earnings from year 1 to year 2) to proxy for expected growth in earnings (expgrthw). Default risk (or distress risk) is proxied by Altman's (1993) Zscore. A higher value of the Zscore indicates a lower likelihood of default. Based on Merton (1987)'s argument, we also include the variable investor base (inv_basew) measured as the number of common ordinary shareholders divided by common shares outstanding. We expect this variable to be negatively related to the firm's risk.

2.5. Empirical results

2.5.1. Descriptive statistics

Table 2.2 reports the sample distribution by year for the whole sample and for the two subsamples based on S&P500 membership. Table 2.3 reports the descriptive statistics of the risk measures, the KLD scores, and the explanatory variables for the whole sample.[58] Panel A of Table 2.3 shows that the mean (median) annualized total risk is 0.45 (0.38) using five-year monthly returns (volatilityw) and 0.39 (0.36) using one-year daily returns (dvolatility). The

[58] All the variables, except the social performance measures, are winsorized at the 1st and 99th percentiles to ensure that our results are not driven by outliers.

mean (median) idiosyncratic risk is 0.35 (0.32) using the CAPM (sdresCAPMw), and 0.34 (0.31) using the three- or four-factor model (sdresffw and sdres4ffw).

Table 2.2: Sample distribution by year

Year	All firms	S&P500 firms	Non S&P500 firms
1991	493	382	111
1992	495	383	112
1993	492	383	109
1994	483	381	102
1995	483	377	106
1996	487	376	111
1997	485	372	113
1998	473	361	112
1999	478	359	119
2000	482	365	117
2001	795	376	419
2002	775	364	411
2003	2036	371	1665
2004	2105	372	1733
2005	2043	370	1673
2006	2039	365	1674
2007	1955	361	1594
Total	16599	6318	10281

Table 2.3: Descriptive statistics of the KLD scores, the risk measures and the explanatory variables

	Mean	Median	sd	Min	Max	skewness	kurtosis	N
Panel A: Risk measures								
Volatilityw	0.45	0.38	0.23	0.16	1.34	1.49	5.22	16388
dvolatilityw	0.39	0.36	0.16	0.15	1.00	1.24	4.95	16599
sdresCAPMw	0.35	0.32	0.15	0.12	0.89	1.18	4.60	16599
sdresffw	0.34	0.31	0.14	0.11	0.87	1.21	4.68	16599
sdres4ffw	0.34	0.31	0.14	0.11	0.86	1.20	4.63	16599
Panel B: Social performance measures								
COMMUNITY	0.01	0	0.11	-0.66	0.8	1.35	11.9	16599
DIVERSITY	-0.03	0	0.21	-0.66	0.87	-0.01	2.82	16599
EMPLOYEE	-0.03	0	0.16	-0.8	0.83	-0.02	4.60	16599
ENVIRONMENT	-0.01	0	0.11	-0.83	0.66	-1.21	10.9	16599
HUMRIGHT	-0.02	0	0.10	-1	1	-3.50	28.8	16599
PRODUCT	-0.03	0	0.16	-1	0.75	-1.63	9.55	16599
GOVERNANCE	-0.05	0	0.16	-0.75	0.66	-0.03	4.61	16599
STR_COM	0.03	0	0.09	0	0.8	3.37	15.4	16599
CON_COM	0.01	0	0.06	0	0.75	4.84	27.3	16599
STR_DIV	0.07	0	0.12	0	0.87	2.13	8.21	16599
CON_DIV	0.10	0	0.16	0	0.66	0.92	2.27	16599
STR_EMP	0.05	0	0.10	0	0.83	2.23	8.54	16599
CON_EMP	0.08	0	0.12	0	0.8	1.43	5.04	16599
STR_ENV	0.02	0	0.08	0	0.8	3.53	18.31	16599
CON_ENV	0.04	0	0.11	0	1	3.15	13.87	16599
STR_HUM	0.00	0	0.04	0	1	11.3	147.46	15119
CON_HUM	0.02	0	0.09	0	1	4.70	30.44	16599
STR_PRO	0.02	0	0.08	0	0.75	3.20	13.32	16599
CON_PRO	0.05	0	0.14	0	1	2.92	12.72	16599
STR_GOV	0.03	0	0.09	0	0.66	2.90	11.18	16599
CON_GOV	0.08	0	0.12	0	0.75	1.46	5.10	16599
Panel C: Independent variables								
dispeps1w	0.09	0.05	0.14	0	0.95	3.49	17.1	15786
expgrthW	0.16	0.14	0.12	0	1	4.05	24.9	16005
ret1y	0.14	0.14	0.39	-3.34	3.13	-0.17	6.78	16599
avgturnover	0.00	0.00	0.00	0.00	0.23	4.24	55.8	16599
cvturnover	0.83	0.73	0.39	0.24	6.65	2.76	18.4	16599
lnmkteq	7.50	7.34	1.51	2.20	13.1	0.53	3.12	16560
bmw	0.42	0.37	0.28	-0.21	1.49	1.07	5.01	16557
investment	0.11	0.09	0.09	0	1.49	2.71	16.97	16587
zscorew	5.00	3.53	6.37	-78.29	74.8	3.64	36.6	16599
netlevw	0.11	0.12	0.26	-0.83	2.59	0.25	6.25	16587
sdroa5yw	0.05	0.03	0.06	0.00	0.40	3.12	14.38	16582
inv_basew	0.15	0.06	0.22	0.00	1.23	2.49	10.11	16245

Notes:

This table presents the descriptive statistics of the risk measures (panel A), the social performance measures (Panel B), and the explanatory variables (Panel C) for the 16,599 firm-year sample observations between 1991 and 2007.

Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively.

We compute an average measure which is equal to the difference between the average strength and average concern for each SP dimension, namely, Community relations (COMMUNITY), Diversity (DIVERSITY), Employee relations (EMPLOYEE), Environmental performance (ENVIRONMENT), Human Rights (HUMRIGHT), Product (PRODUCT), and Corporate Governance (GOVERNANCE).

We also compute separate average strength and concern scores for each SP dimension, namely, Community strengths (STR_COM), Community concerns (CON_COM), Diversity strengths (STR_DIV), Diversity concerns (CON_DIV), Employee strengths (STR_EMP), Employee concerns (CON_EMP), Environment strengths (STR_ENV), Environment concerns (CON_ENV), Human Rights strengths (STR_HUM), Human Rights concerns (CON_HUM), Product strengths (STR_PRO), Product concerns (CON_PRO), Corporate Governance strengths (STR_GOV), and Corporate Governance concerns (CON_GOV).

Dispersion of analyst forecasts is measured by the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w). Expected growth in earnings (expgrthw) is the mean annualized five-year earnings growth rate from I/B/E/S (where available, otherwise estimated as the implicit growth in forecasted earnings from year 1 to year 2). Ret1y is the annualized return from the previous year's daily stock returns. The level of liquidity is proxied by the average daily share turnover (avgturnover), and the liquidity risk is proxied by the coefficient of variation (cvturnover) of this measure over the previous year. Share turnover is defined as daily shares traded divided by daily shares outstanding. Firm size (lnmkteq) is proxied by the logarithm of the market value of common equity at the most recent fiscal year-end. Book-to-market ratio (bmw) is computed as the ratio of the book to market value of common equity as of the most recent fiscal year end. Investment is computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets. Net leverage (netlevw) is measured as the ratio of long-term debt minus cash & marketable securities to the market value of common equity using values for the most recent fiscal year end. Distress risk (zscorew) is computed following Altman (1993) as:

$$Zscore = 1.2 \times \left(\frac{NWC}{TA}\right) + 1.4 \times \left(\frac{RE}{TA}\right) + 3.3 \times \left(\frac{EBIT}{TA}\right) + \left(\frac{Sales}{TA}\right) + 0.6 \times \left(\frac{MVEquity}{BVTL}\right)$$

where, NWC is net working capital (current assets – current liabilities), RE is retained earnings, EBIT is earnings before interest and taxes, MVEquity is the market value of total equity (common and preferred stocks), BVTL is total liabilities (current and long term liabilities), and TA is total assets. The variable sdroa5yw is the standard deviation of return on assets (ROA) over the five previous years up to the fiscal-year end date of each firm-year observation. Investor base (inv_basew) is measured as the number of common ordinary shareholders divided by common shares outstanding. Except for the social performance measures and dummy variables, the variables are winsorized (w) at the 1st and 99th percentiles.

Panel B of Table 2.3 shows that the mean (median) values of SP dimensions are negative (zero), ranging between -0.05 and 0.01. Except for the Community dimension, the average strength scores of SP dimensions are lower than the corresponding average concern scores. Overall, the mean (median) values of SP dimensions are relatively small (zero) suggesting that the typical firm-year observation is characterized by equal number of strengths and concerns or the absence of both. Panel C of Table 2.3 reports descriptive statistics for our explanatory variables. Table 2.4 reports the descriptive statistics of the risk measures, the KLD scores, and the explanatory variables for the two subsamples based on S&P500 membership. As expected, the two subsamples have different risk profile, different SP, and different financial characteristics. Specifically, Panel A of Table 2.4 shows that S&P500 firms are less risky than non S&P500 firms. Panel B of Table 2.4 shows that S&P500 firms have significantly higher strengths in all dimensions, except the governance dimension. They also have significantly higher concerns in all dimensions, except the diversity dimension.

Table 2.4: Descriptive statistics by S&P500 membership

	S&P500 firms				Non S&P500 firms						
variable	mean	median	sd	N	mean	median	sd	N	Mean diff	ttest	ranksum
Panel A: Risk measures											
Volatilityw	0.34	0.3	0.15	6301	0.52	0.45	0.25	10087	0.18	0.00	0.00
dvolatilityw	0.34	0.3	0.15	6318	0.42	0.39	0.15	10281	0.08	0.00	0.00
sdresCAPMw	0.3	0.27	0.13	6318	0.38	0.36	0.14	10281	0.08	0.00	0.00
sdresffw	0.3	0.26	0.13	6318	0.37	0.35	0.14	10281	0.07	0.00	0.00
sdres4ffw	0.29	0.26	0.13	6318	0.37	0.34	0.14	10281	0.08	0.00	0.00
Panel B: Social performance measures											
STR_COM	0.072	0	0.13	6318	0.008	0	0.04	10281	-0.06	0.00	0.00
CON_COM	0.027	0	0.08	6318	0.005	0	0.04	10281	-0.02	0.00	0.00
STR_DIV	0.119	0	0.16	6318	0.047	0	0.08	10281	-0.07	0.00	0.00
CON_DIV	0.076	0	0.14	6318	0.127	0	0.16	10281	0.05	0.00	0.00
STR_EMP	0.096	0	0.13	6318	0.029	0	0.07	10281	-0.06	0.00	0.00
CON_EMP	0.095	0	0.13	6318	0.08	0	0.11	10281	-0.01	0.00	0.00
STR_ENV	0.053	0	0.11	6318	0.013	0	0.05	10281	-0.04	0.00	0.00
CON_ENV	0.09	0	0.15	6318	0.014	0	0.05	10281	-0.07	0.00	0.00
STR_HUM	0.009	0	0.06	5170	0	0	0.02	9949	0	0.00	0.00
CON_HUM	0.051	0	0.14	6318	0.009	0	0.04	10281	-0.04	0.00	0.00
STR_PRO	0.044	0	0.1	6318	0.013	0	0.05	10281	-0.03	0.00	0.00
CON_PRO	0.113	0	0.19	6318	0.025	0	0.08	10281	-0.08	0.00	0.00
STR_GOV	0.019	0	0.07	6318	0.04	0	0.1	10281	0.02	0.00	0.00
CON_GOV	0.137	0.14	0.15	6318	0.049	0	0.09	10281	-0.08	0.00	0.00
Panel C: Independent variables											
lnmkteq	8.76	8.7	1.35	6298	6.72	6.69	1.01	10262	-2.03	0.00	0.00
bmw	0.39	0.34	0.27	6298	0.43	0.39	0.29	10259	0.04	0.00	0.00
netlevw	0.16	0.17	0.19	6317	0.07	0.07	0.29	10270	-0.09	0.00	0.00
retly	0.13	0.14	0.32	6318	0.14	0.15	0.43	10281	0	0.24	0.03
avgturnover	0	0	0	6318	0.01	0	0	10281	0	0.00	0.00
cvturnover	0.67	0.6	0.28	6318	0.92	0.82	0.42	10281	0.25	0.00	0.00
dispeps1w	0.1	0.05	0.15	6278	0.09	0.05	0.14	9508	-0.01	0.00	0.00
investment	0.1	0.06	0.07	6317	0.11	0.06	0.11	10270	0.01	0.00	0.00
expgrthw	0.13	0.12	0.06	6309	0.18	0.15	0.14	9696	0.05	0.00	0.00
zscorew	4.41	3.34	4.82	6318	5.37	3.68	7.14	10281	0.95	0.00	0.00
sdroa5yw	0.03	0.02	0.03	6316	0.06	0.03	0.07	10266	0.03	0.00	0.00
inv_basew	0.2	0.11	0.24	6200	0.12	0.03	0.2	10045	-0.07	0.00	0.00

Note:

This table presents the descriptive statistics of the risk measures (panel A), the social performance measures (Panel B), and the explanatory variables (Panel C) for the two subsamples based on S&P500 membership between 1991 and 2007. All variables are defined in footnotes of Table 2.3. The last three columns are, respectively, the mean difference, the probability associated with the ttest for the mean difference, and the probability associated with the Wilcoxon rank-sum (Mann-Whitney) test for the median difference between the groups.

Table 2.5: Correlation coefficients between the risk and social performance measures

	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
Volatilityw	1.0000				
dvolatilityw	0.6435*	1.0000			
sdresCAPMw	0.6313*	0.9832*	1.0000		
sdresffw	0.6255*	0.9783*	0.9980*	1.0000	
sdres4ffw	0.6262*	0.9742*	0.9963*	0.9992*	1.0000
COMMUNITY	-0.1282*	-0.1092*	-0.1008*	-0.0975*	-0.0963*
DIVERSITY	-0.1485*	-0.1263*	-0.1335*	-0.1304*	-0.1306*
EMPLOYEE	-0.1214*	-0.0293	-0.0339*	-0.0336*	-0.0341*
ENVIRONMENT	0.0911*	0.0904*	0.0921*	0.0957*	0.0983*
HUMRIGHT	0.0802*	0.0991*	0.1015*	0.1028*	0.1042*
PRODUCT	0.0942*	0.1156*	0.1167*	0.1158*	0.1164*
GOVERNANCE	0.1316*	0.1025*	0.1242*	0.1245*	0.1280*
STR_COM	-0.2158*	-0.1794*	-0.1766*	-0.1745*	-0.1750*
CON_COM	-0.1011*	-0.0792*	-0.0895*	-0.0921*	-0.0950*
STR_DIV	-0.1079*	-0.0992*	-0.1110*	-0.1083*	-0.1088*
CON_DIV	0.1178*	0.0947*	0.0952*	0.0931*	0.0930*
STR_EMP	-0.1404*	-0.0517*	-0.0689*	-0.0702*	-0.0734*
CON_EMP	0.0371*	-0.0061	-0.0147	-0.0161	-0.0182
STR_ENV	-0.1860*	-0.1358*	-0.1389*	-0.1387*	-0.1394*
CON_ENV	-0.2289*	-0.1918*	-0.1958*	-0.1995*	-0.2026*
STR_HUM	-0.0597*	-0.0337	-0.0284	-0.0268	-0.0267
CON_HUM	-0.1052*	-0.1150*	-0.1158*	-0.1165*	-0.1180*
STR_PRO	-0.1225*	-0.0655*	-0.0698*	-0.0679*	-0.0682*
CON_PRO	-0.1726*	-0.1647*	-0.1683*	-0.1662*	-0.1670*
STR_GOV	0.0876*	0.0697*	0.0796*	0.0800*	0.0815*
CON_GOV	-0.1063*	-0.0818*	-0.1025*	-0.1027*	-0.1062*

Note:
This table presents the correlation coefficients between the risk and social performance measures for the 16,599 firm-year sample observations between 1991 and 2007. All variables are defined in footnotes of Table 2.3.
* Statistical significance at the 1% level ($p < 0.01$).

Table 2.6: Correlation coefficients between the social performance measures

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
COMMUNITY	(1)	1.0000																				
DIVERSITY	(2)	0.2060*	1.0000																			
EMPLOYEE	(3)	0.1357*	0.1525*	1.0000																		
ENVIRONMENT	(4)	0.1308*	0.0484*	0.0710*	1.0000																	
HUMRIGHT	(5)	-0.0279	-0.0598*	0.0165	0.1563*	1.0000																
PRODUCT	(6)	0.0257	-0.0794*	0.1086*	0.2101*	0.0985*	1.0000															
GOVERNANCE	(7)	-0.0301	-0.1598*	-0.0359*	0.1153*	0.0579*	0.1911*	1.0000														
STR_COM	(8)	0.8163*	0.2870*	0.1539*	0.0134	-0.1005*	-0.0852*	-0.1196*	1.0000													
CON_COM	(9)	-0.5076*	0.0727*	-0.0045	-0.2057*	-0.1016*	-0.1715*	-0.1264*	0.0833*	1.0000												
STR_DIV	(10)	0.2188*	0.6933*	0.1014*	0.0752*	-0.0762*	-0.1522*	-0.2112*	0.3489*	0.1429*	1.0000											
CON_DIV	(11)	-0.1095*	-0.8226*	-0.1288*	-0.0070	0.0218	-0.0113	0.0522*	-0.1178*	0.0132	-0.1605*	1.0000										
STR_EMP	(12)	0.1223*	0.2277*	0.6318*	-0.0188	-0.0400*	0.0225	-0.1513*	0.2428*	0.1512*	0.3000*	-0.0751*	1.0000									
CON_EMP	(13)	-0.0713*	-0.0036	-0.7538*	-0.1075*	-0.0551*	-0.1209*	-0.0820*	0.0074	0.1340*	0.1236*	0.1024*	0.0331*	1.0000								
STR_ENV	(14)	0.1377*	0.1969*	0.1419*	0.3985*	-0.0771*	-0.0346*	-0.0602*	0.2620*	0.1532*	0.2547*	-0.0686*	0.2967*	0.0686*	1.0000							
CON_ENV	(15)	-0.0362*	0.0920*	0.0288	-0.7491*	-0.2177*	-0.2428*	-0.1630*	0.1753*	0.3240*	0.1061*	-0.0423*	0.2338*	0.1610*	0.3091*	1.0000						
STR_HUM	(16)	0.1512*	0.0975*	0.0480*	-0.0007	0.3979*	-0.0405*	-0.0545*	0.2036*	0.0314	0.1241*	-0.0364*	0.0866*	0.0115	0.0825*	0.0635*	1.0000					
CON_HUM	(17)	0.0811*	0.1003*	0.0003	-0.1630*	-0.9237*	-0.1192*	-0.0824*	0.1737*	0.1191*	0.1292*	-0.0354*	0.0752*	0.0634*	0.1121*	0.2499*	0.1229*	1.0000				
STR_PRO	(18)	0.1178*	0.1452*	0.1801*	0.0862*	-0.0454*	0.4391*	-0.0592*	0.1627*	0.0394*	0.1777*	-0.0586*	0.2829*	0.0076	0.2087*	0.0614*	0.0222	0.0547*	1.0000			
CON_PRO	(19)	0.0366*	0.1686*	-0.0208	-0.1856*	-0.1346*	-0.8675*	-0.2450*	0.1847*	0.2123*	0.2674*	-0.0199	0.1316*	0.1385*	0.1539*	0.3037*	0.0559*	0.1626*	0.0660*	1.0000		
STR_GOV	(20)	0.0154	-0.0428*	-0.0075	0.0783*	0.0008	0.0443*	0.6418*	0.0108	-0.0104	0.0348*	0.0860*	0.0134	0.0211	0.0763*	-0.0261	0.0259	0.0099	0.0250	-0.0354*	1.0000	
CON_GOV	(21)	0.0504*	0.1759*	0.0410*	-0.0920*	-0.0746*	-0.2154*	-0.8254*	0.1632*	0.1564*	0.2997*	-0.0044	0.2065*	0.1230*	0.1343*	0.1924*	0.0904*	0.1143*	0.0952*	0.2919*	-0.0968*	1.0000

Note:

This table presents the correlation coefficients between the social performance measures for the 16,599 firm-year sample observations between 1991 and 2007. All variables are defined in footnotes of Table 2.3.
*Statistical significance at the 1% level ($p < 0.01$).

Table 2.5 reports that all risk measures are positively correlated as expected. All risk measures are negatively correlated with Community, Diversity and Employee relations, whereas they are positively correlated with Environment, Human Rights, Product and Governance. Diversity concerns as well as Governance strengths are positively correlated with the risk measures. The strengths and concerns of the other SP dimensions are negatively correlated with the risk measures. Table 2.6 reports that some SP dimensions are positively correlated, whereas others are negatively correlated. For example, Employee is positively correlated with Environment and Product, but negatively correlated with Corporate Governance. The correlations between strengths and concerns within the same dimension are relatively low, although significant, which supports the notion that they are different concepts. Also, the strengths (concerns) of several SP dimensions are correlated. Overall, the correlation coefficients among social performance measures are relatively low suggesting that multicollinearity should not affect the results.

2.5.2. Relation between firm risk and the individual dimensions of social performance

Our first hypothesis states that the relation between the firm's risk and SP varies with the individual dimension of SP being considered. Our objective is to test whether the effects on firm's risk of some SP dimensions are more important than others. The results suggest that not all SP dimensions are relevant for firm risk.

Table 2.7: Relation between the risk measures and the social performance dimensions

	All firms				
	Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
COMMUNITY	0.006	-0.004	-0.004	-0.005	-0.005
	(1.11)	(-0.50)	(-0.55)	(-0.66)	(-0.62)
DIVERSITY	-0.004	0.007	0.010	0.011	0.012
	(-0.36)	(0.67)	(1.16)	(1.25)	(1.31)
EMPLOYEE	-0.025***	-0.017**	-0.017**	-0.018**	-0.017**
	(-3.13)	(-2.05)	(-2.15)	(-2.29)	(-2.30)
ENVIRONMENT	-0.011*	-0.000	0.003	0.005	0.005
	(-1.80)	(-0.03)	(0.30)	(0.57)	(0.57)
HUMRIGHT	-0.012**	-0.014**	-0.015**	-0.015**	-0.015**
	(-2.09)	(-2.13)	(-2.31)	(-2.28)	(-2.35)
PRODUCT	-0.014	-0.001	-0.009	-0.009	-0.010
	(-1.58)	(-0.06)	(-1.12)	(-1.10)	(-1.27)
GOVERNANCE	0.000	-0.017	-0.016	-0.017	-0.017
	(0.05)	(-1.19)	(-1.16)	(-1.22)	(-1.25)
lnmkteq	-0.259***	-0.270***	-0.304***	-0.300***	-0.305***
	(-9.92)	(-7.65)	(-9.49)	(-9.98)	(-10.19)
bmw	-0.042***	0.007	0.007	0.004	0.002
	(-2.92)	(0.38)	(0.38)	(0.21)	(0.10)
netlevw	-0.017	-0.006	-0.003	-0.004	-0.004
	(-1.61)	(-0.50)	(-0.26)	(-0.33)	(-0.36)
ret1y	0.027	-0.009	-0.014	-0.016	-0.016
	(0.94)	(-0.18)	(-0.31)	(-0.38)	(-0.37)
avgturnover	0.272***	0.315***	0.302***	0.297***	0.290***
	(16.46)	(11.25)	(12.82)	(12.61)	(12.74)
cvturnover	0.003	0.152***	0.200***	0.215***	0.220***
	(0.37)	(9.94)	(10.78)	(10.82)	(10.76)
dispeps1w	-0.003	0.049***	0.049***	0.048***	0.046***
	(-0.28)	(3.24)	(3.24)	(3.30)	(3.03)
investment	0.048***	0.066***	0.065***	0.064***	0.063***
	(4.07)	(5.79)	(6.19)	(6.29)	(6.44)
expgrthw	0.094***	0.109***	0.102***	0.099***	0.098***
	(6.54)	(5.01)	(5.38)	(5.26)	(5.33)
zscorew	-0.052***	-0.000	-0.010	-0.011	-0.010
	(-3.81)	(-0.02)	(-0.52)	(-0.60)	(-0.56)
sdroa5yw	0.262***	0.176***	0.181***	0.181***	0.179***
	(15.26)	(6.47)	(7.48)	(7.71)	(8.06)
inv_basew	-0.046***	-0.043***	-0.038***	-0.037***	-0.037***
	(-4.23)	(-5.18)	(-4.88)	(-4.88)	(-4.82)
Constant	2.249***	2.574***	2.757***	2.755***	2.794***
	(13.53)	(10.61)	(13.48)	(13.91)	(14.07)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	14800	14970	14970	14970	14970
Number of firms	2749	2796	2796	2796	2796
R-squared	0.651	0.635	0.641	0.638	0.637

Table 2.7 (continued): Relation between the risk measures and the social performance dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
COMMUNITY	-0.004	-0.013**	-0.013**	-0.012*	-0.012*	0.009	-0.033**	-0.033*	-0.034*	-0.034*
	(-0.72)	(-2.03)	(-2.03)	(-1.88)	(-1.84)	(0.54)	(-2.02)	(-1.92)	(-1.96)	(-1.90)
DIVERSITY	-0.010	-0.003	0.004	0.006	0.007	-0.008	0.005	0.004	0.003	0.003
	(-0.87)	(-0.20)	(0.32)	(0.50)	(0.57)	(-0.61)	(0.54)	(0.41)	(0.35)	(0.30)
EMPLOYEE	-0.003	-0.016*	-0.017**	-0.018**	-0.017**	-0.056***	-0.031**	-0.029**	-0.028**	-0.028**
	(-0.50)	(-1.84)	(-2.09)	(-2.26)	(-2.25)	(-3.38)	(-2.09)	(-2.04)	(-2.04)	(-2.06)
ENVIRONMENT	0.005	0.013	0.015*	0.017**	0.017**	-0.018	-0.029**	-0.019	-0.016	-0.015
	(0.90)	(1.59)	(1.92)	(2.08)	(2.09)	(-1.13)	(-2.12)	(-1.41)	(-1.20)	(-1.04)
HUMRIGHT	-0.004	-0.005	-0.005	-0.004	-0.004	-0.000	0.006	0.006	0.006	0.006
	(-0.87)	(-0.92)	(-0.94)	(-0.84)	(-0.78)	(-0.02)	(0.28)	(0.30)	(0.30)	(0.31)
PRODUCT	-0.009	-0.001	-0.004	-0.003	-0.004	-0.019	0.017	0.006	0.004	0.003
	(-1.39)	(-0.16)	(-0.61)	(-0.54)	(-0.69)	(-0.98)	(1.15)	(0.44)	(0.28)	(0.18)
GOVERNANCE	-0.044***	-0.039***	-0.046***	-0.047***	-0.047***	0.019	0.007	0.008	0.008	0.007
	(-4.87)	(-3.51)	(-4.32)	(-4.24)	(-4.31)	(1.53)	(0.69)	(0.75)	(0.75)	(0.68)
lnmkteq	-0.146***	-0.100***	-0.143***	-0.153***	-0.160***	-0.355***	-0.480***	-0.514***	-0.506***	-0.513***
	(-6.48)	(-3.29)	(-4.81)	(-5.02)	(-5.14)	(-11.06)	(-12.97)	(-13.34)	(-13.24)	(-13.52)
bmw	0.003	0.022	0.029	0.024	0.021	-0.066***	-0.014	-0.020	-0.023	-0.025
	(0.20)	(1.01)	(1.31)	(1.08)	(0.98)	(-3.82)	(-0.61)	(-0.83)	(-1.01)	(-1.12)
netlevw	-0.046*	-0.021	-0.010	-0.012	-0.013	-0.012	0.003	0.005	0.005	0.005
	(-1.77)	(-0.65)	(-0.38)	(-0.44)	(-0.45)	(-0.97)	(0.19)	(0.38)	(0.39)	(0.37)
ret1y	0.011	-0.055	-0.057	-0.058	-0.053	0.037	0.019	0.014	0.011	0.011
	(0.54)	(-1.21)	(-1.61)	(-1.57)	(-1.46)	(1.09)	(0.37)	(0.29)	(0.23)	(0.22)
avgturnover	0.260***	0.355***	0.321***	0.306***	0.293***	0.292***	0.320***	0.317***	0.315***	0.311***
	(10.31)	(5.91)	(5.72)	(5.44)	(5.02)	(14.89)	(13.15)	(15.29)	(14.66)	(15.18)

Table 2.7 (continued): Relation between the risk measures and the social performance dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
cvturnover	0.029**	0.218***	0.264***	0.278***	0.286***	-0.010	0.131***	0.179***	0.194***	0.198***
	(2.35)	(10.86)	(11.85)	(11.72)	(11.58)	(-1.47)	(7.03)	(8.17)	(8.25)	(8.29)
dispeps1w	-0.001	0.045***	0.041***	0.040***	0.038**	-0.003	0.057***	0.057***	0.056***	0.054***
	(-0.08)	(2.70)	(2.60)	(2.60)	(2.46)	(-0.20)	(2.83)	(2.85)	(2.83)	(2.66)
investment	0.034**	0.058***	0.070***	0.068***	0.067***	0.048***	0.053***	0.052***	0.053***	0.053***
	(2.06)	(3.49)	(4.24)	(4.00)	(3.90)	(3.31)	(4.09)	(4.40)	(4.55)	(4.70)
expgrthw	0.110***	0.205***	0.174***	0.171***	0.166***	0.080***	0.078***	0.076***	0.075***	0.075***
	(5.08)	(5.54)	(5.69)	(5.67)	(5.51)	(5.80)	(5.05)	(5.55)	(5.34)	(5.48)
zscorew	-0.025*	-0.009	-0.036	-0.039	-0.036	-0.064***	-0.005	-0.007	-0.006	-0.006
	(-1.69)	(-0.27)	(-1.32)	(-1.37)	(-1.26)	(-4.18)	(-0.27)	(-0.36)	(-0.36)	(-0.32)
sdroa5yw	0.246***	0.322***	0.315***	0.308***	0.295***	0.240***	0.147***	0.150***	0.149***	0.149***
	(8.38)	(6.12)	(6.15)	(6.09)	(6.10)	(14.82)	(6.01)	(7.06)	(7.30)	(7.53)
inv_basew	-0.037***	-0.050***	-0.045***	-0.047***	-0.047***	-0.052***	-0.045***	-0.045***	-0.044***	-0.044***
	(-3.73)	(-5.06)	(-4.88)	(-4.94)	(-4.93)	(-3.57)	(-4.17)	(-4.18)	(-4.22)	(-4.22)
Constant	1.774***	1.788***	1.993***	2.082***	2.129***	2.577***	3.395***	3.620***	3.580***	3.624***
	(10.77)	(6.35)	(7.77)	(7.92)	(7.97)	(14.02)	(16.16)	(17.74)	(16.92)	(17.27)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6134	6150	6150	6150	6150	8666	8820	8820	8820	8820
Number of firms	664	666	666	666	666	2317	2362	2362	2362	2362
R-squared	0.689	0.713	0.710	0.702	0.698	0.591	0.596	0.604	0.602	0.603

Note:

Table 2.7 presents results from regressions of the risk measures on the individual dimensions of SP and controls over the period 1991–2007 for the whole sample as well as for the two subsamples based on S&P500 membership. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively.

The individual dimensions of SP are Community relations (COMMUNITY), Diversity (DIVERSITY), Employee relations (EMPLOYEE), Environmental performance (ENVIRONMENT), Human Rights (HUMRIGHT), Product (PRODUCT), and Corporate Governance (GOVERNANCE), respectively. All variables are defined in footnotes of Table 2.3.

Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm and time) t-Statistics are reported in parentheses. We use the two-way cluster robust standard error approach of Petersen (2009).

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

For the whole sample, Table 2.7 shows that only two dimensions (Employee relations and Human Rights) are significantly and negatively related to stock return volatility and idiosyncratic risk. However, we get a slightly different picture when splitting the sample by S&P500 membership. Employee relations continue to be significantly and negatively related to firm's risk for both subsamples, whereas Human Rights are no longer related to firm's risk. Corporate Governance is significantly and negatively related to stock return volatility and idiosyncratic risk only for S&P500. Community is now significantly and negatively related to stock return volatility, measured using daily returns, for both subsamples. Environment is positively related to idiosyncratic risk for S&P500 firms, whereas it is negatively related to stock return volatility measured using daily returns for non S&P500 firms.

Overall, the results reported in Table 2.7 support our first hypothesis, except for Product, suggesting that not all SP dimensions are relevant for firm's risk. For S&P500 firms, Employee relations, Corporate Governance and Community affect negatively firm risk, whereas Environment positively affects firm risk. For non S&P500 firms, Employee relations, Community and Environment affect negatively firm risk. The other dimensions

(Diversity, Human Rights, and Product) do not impact significantly firm risk for both subsamples.

As discussed in the introduction, there are several drawbacks when using measures which combines strengths and concerns (i.e., netting a firm's positive and negative social actions). A simple example makes the argument more explicit. Consider the environmental performance of two firms A and B. Firm A has four strengths and four concerns, whereas firm B has one strength and one concern. Firms A and B will have the same environmental performance using a measure which combines strengths and concerns. Therefore, it might be better to consider strengths and concerns separately in order to distinguish between good and bad performers on each SP dimensions. This issue is examined in the next section.

2.5.3. Relation between firm risk and strengths and concerns of individual dimensions of social performance

Table 2.8 report the results regarding the second and third hypothesis for the whole sample and the two subsamples based on S&P500 membership.[59] For the whole sample, all coefficients associated with Community strengths and concerns, Employee and Product strengths as well as Environment concerns are insignificant suggesting that they have no significant impact on firm's risk.[60] Product concerns are significantly and positively related to idiosyncratic risk measured using the four-factor model, whereas Environment strengths are significantly and negatively related to volatility measured using one-year daily returns. Employee, Diversity, Corporate Governance and Human Rights concerns are significantly

[59] We exclude from our regressions the Human Rights strengths because their inclusion reduces the sample size since KLD includes Human Rights strengths beginning from 1994. The number of observations for Human Rights strengths which are different from zero does not exceed 1% of total observations. The results after including Human Rights strengths are similar (results not reported and are available upon request).

[60] We also consider systematic risk measured as the market beta derived either from the CAPM or the four-factor Carhart (1997) model, respectively. Some of the coefficients associated with SP dimensions are significant when the dependent variable is the market beta computed using the CAPM. For example, for the whole sample, the CAPM beta is positively related to Employee and Governance concerns, and negatively related to Community concerns and Environment strengths. However, all coefficients associated with SP dimensions are insignificant when the dependent variable is the market beta computed using the four-factor model. For the sake of space, we do not report these results which are available upon request.

and positively related to total risk and idiosyncratic risk. These effect ranges from an increase of 1.5 to 3.3% of firm's risk which corresponds to an increase of 0.58% to 1.28% of the total risk of the average firm (0.39). For example, a one standard deviation increase of the score of Corporate Governance concerns would increase firm's risk by about 1.17% (0.39*0.03). If we add the increases associated with all concerns, then the effect on firm's risk can be considered as economically significant. As for the strengths, Diversity and Corporate Governance strengths are significantly and positively related to total risk and idiosyncratic risk. These effects range from an increase of 1.5 to 2.4% of firm's risk which corresponds to an increase of 0.58% to 0.93% of the total risk of the average firm.

Table 2.8: Relation between the risk measures and strengths and concerns of SP dimensions

	All firms				
	Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
STR_COM	-0.000	-0.007	-0.007	-0.009	-0.009
	(-0.01)	(-0.74)	(-0.77)	(-0.97)	(-0.98)
CON_COM	-0.002	0.009	0.010	0.009	0.009
	(-0.43)	(1.07)	(1.37)	(1.26)	(1.22)
STR_DIV	0.023*	0.036***	0.040***	0.041***	0.042***
	(1.89)	(3.25)	(3.82)	(3.84)	(3.95)
CON_DIV	0.024**	0.021***	0.021***	0.021***	0.021***
	(2.36)	(2.99)	(3.03)	(2.90)	(2.88)
STR_EMP	0.001	0.013*	0.009	0.008	0.008
	(0.16)	(1.65)	(1.17)	(1.12)	(1.07)
CON_EMP	0.034***	0.032***	0.030***	0.031***	0.030***
	(4.00)	(3.59)	(3.77)	(3.94)	(3.98)
STR_ENV	-0.012*	-0.016**	-0.011	-0.008	-0.007
	(-1.70)	(-2.07)	(-1.36)	(-1.05)	(-0.82)
CON_ENV	0.011	-0.009	-0.008	-0.009	-0.008
	(1.43)	(-0.70)	(-0.70)	(-0.80)	(-0.67)
CON_HUM	0.015***	0.016**	0.018***	0.018***	0.018***
	(3.11)	(2.31)	(2.73)	(2.75)	(2.85)
STR_PRO	0.000	0.008	0.010	0.011	0.011
	(0.05)	(1.10)	(1.44)	(1.56)	(1.56)
CON_PRO	0.014	0.003	0.013*	0.013*	0.015**
	(1.50)	(0.40)	(1.78)	(1.87)	(2.08)
STR_GOV	0.018**	0.015**	0.017**	0.017**	0.017**
	(2.11)	(2.23)	(2.37)	(2.46)	(2.30)
CON_GOV	0.013	0.030**	0.031**	0.033***	0.033***
	(1.63)	(2.24)	(2.50)	(2.61)	(2.63)

Table 2.8 (continued): Relation between the risk measures and strengths and concerns of SP dimensions

	All firms				
	Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
lnmkteq	-0.285***	-0.301***	-0.340***	-0.337***	-0.343***
	(-8.50)	(-7.41)	(-9.28)	(-9.70)	(-9.91)
bmw	-0.047***	0.003	0.002	-0.002	-0.004
	(-3.13)	(0.14)	(0.09)	(-0.10)	(-0.22)
netlevw	-0.014	-0.003	0.001	0.000	-0.000
	(-1.36)	(-0.20)	(0.05)	(0.00)	(-0.03)
ret1y	0.029	-0.006	-0.011	-0.014	-0.013
	(1.02)	(-0.13)	(-0.25)	(-0.31)	(-0.30)
avgturnover	0.273***	0.316***	0.303***	0.298***	0.292***
	(16.20)	(11.56)	(13.11)	(12.90)	(13.06)
cvturnover	-0.001	0.148***	0.195***	0.210***	0.215***
	(-0.09)	(9.67)	(10.33)	(10.36)	(10.29)
dispeps1w	-0.006	0.046***	0.046***	0.045***	0.042***
	(-0.62)	(3.14)	(3.11)	(3.17)	(2.88)
investment	0.047***	0.064***	0.064***	0.062***	0.062***
	(3.95)	(5.71)	(6.08)	(6.17)	(6.33)
expgrthw	0.094***	0.109***	0.101***	0.098***	0.098***
	(6.41)	(4.98)	(5.33)	(5.20)	(5.27)
zscorew	-0.051***	0.000	-0.009	-0.010	-0.009
	(-3.75)	(0.01)	(-0.46)	(-0.54)	(-0.49)
sdroa5yw	0.257***	0.170***	0.175***	0.174***	0.173***
	(14.66)	(6.38)	(7.35)	(7.55)	(7.88)
inv_basew	-0.048***	-0.045***	-0.041***	-0.040***	-0.040***
	(-4.37)	(-5.56)	(-5.21)	(-5.24)	(-5.21)
Constant	2.369***	2.723***	2.927***	2.929***	2.971***
	(12.51)	(11.06)	(13.98)	(14.47)	(14.69)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	14800	14970	14970	14970	14970
Number of firms	2749	2796	2796	2796	2796
R-squared	0.654	0.639	0.646	0.642	0.642

Table 2.8 (continued): Relation between the risk measures and strengths and concerns of SP dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
STR_COM	-0.009**	-0.016**	-0.016**	-0.016**	-0.016**	-0.005	-0.039*	-0.039*	-0.040*	-0.040*
	(-2.00)	(-2.37)	(-2.39)	(-2.45)	(-2.46)	(-0.25)	(-1.80)	(-1.74)	(-1.76)	(-1.74)
CON_COM	-0.002	0.008	0.008	0.005	0.005	-0.007	0.018	0.018	0.019	0.018
	(-0.27)	(1.17)	(1.26)	(0.86)	(0.77)	(-0.53)	(1.59)	(1.52)	(1.55)	(1.49)
STR_DIV	0.012	0.020*	0.026**	0.029**	0.030***	0.034	0.030*	0.032**	0.032**	0.033**
	(1.37)	(1.76)	(2.38)	(2.57)	(2.64)	(1.57)	(1.81)	(2.11)	(2.07)	(2.16)
CON_DIV	0.027***	0.027**	0.024**	0.024**	0.024**	0.027*	0.011	0.014*	0.014*	0.015*
	(2.96)	(2.45)	(2.23)	(2.14)	(2.11)	(1.96)	(1.28)	(1.74)	(1.75)	(1.88)
STR_EMP	0.018**	0.011	0.007	0.006	0.006	-0.010	0.016	0.014	0.014	0.014
	(2.48)	(1.16)	(0.87)	(0.74)	(0.72)	(-0.64)	(0.82)	(0.71)	(0.70)	(0.72)
CON_EMP	0.023***	0.035***	0.032***	0.032***	0.031***	0.056***	0.041***	0.038***	0.037***	0.036***
	(2.70)	(3.42)	(3.37)	(3.44)	(3.38)	(4.17)	(3.50)	(3.55)	(3.65)	(3.65)
STR_ENV	-0.005	0.000	0.001	0.002	0.003	-0.031**	-0.040**	-0.030*	-0.026	-0.023
	(-0.98)	(0.05)	(0.14)	(0.37)	(0.51)	(-2.23)	(-2.19)	(-1.75)	(-1.54)	(-1.35)
CON_ENV	-0.009	-0.016	-0.019*	-0.019*	-0.019*	-0.002	0.008	0.002	0.002	0.003
	(-1.33)	(-1.53)	(-1.79)	(-1.80)	(-1.71)	(-0.10)	(0.47)	(0.13)	(0.13)	(0.17)
CON_HUM	0.007	0.005	0.007	0.007	0.006	0.002	0.002	0.000	0.000	-0.000
	(1.32)	(0.85)	(1.19)	(1.15)	(1.12)	(0.09)	(0.09)	(0.00)	(0.01)	(-0.01)
STR_PRO	-0.006	0.002	0.004	0.006	0.006	0.019	0.013	0.016	0.015	0.016
	(-1.00)	(0.20)	(0.56)	(0.78)	(0.81)	(1.44)	(0.83)	(1.01)	(0.99)	(1.03)
CON_PRO	0.008	0.002	0.007	0.008	0.009	0.038*	-0.011	0.003	0.006	0.008
	(1.19)	(0.33)	(1.07)	(1.13)	(1.29)	(1.68)	(-0.79)	(0.21)	(0.38)	(0.53)
STR_GOV	0.005	0.013	0.008	0.008	0.007	0.017*	0.004	0.008	0.010	0.009
	(0.58)	(1.29)	(0.83)	(0.88)	(0.74)	(1.66)	(0.62)	(1.19)	(1.36)	(1.32)
CON_GOV	0.045***	0.043***	0.047***	0.048***	0.049***	-0.009	-0.007	-0.003	-0.001	-0.000
	(5.14)	(4.27)	(4.98)	(4.78)	(4.82)	(-0.62)	(-0.49)	(-0.19)	(-0.08)	(-0.03)

Table 2.8 (continued): Relation between the risk measures and strengths and concerns of SP dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
lnmkteq	-0.167***	-0.129***	-0.174***	-0.186***	-0.193***	-0.365***	-0.484***	-0.521***	-0.513***	-0.520***
	(-6.63)	(-3.87)	(-5.43)	(-5.65)	(-5.78)	(-10.23)	(-12.79)	(-13.31)	(-13.17)	(-13.50)
bmw	-0.001	0.017	0.024	0.018	0.016	-0.066***	-0.015	-0.020	-0.024	-0.026
	(-0.03)	(0.76)	(1.05)	(0.81)	(0.70)	(-3.83)	(-0.63)	(-0.86)	(-1.05)	(-1.17)
netlevw	-0.044*	-0.019	-0.009	-0.011	-0.012	-0.009	0.005	0.007	0.007	0.007
	(-1.77)	(-0.63)	(-0.35)	(-0.42)	(-0.43)	(-0.76)	(0.34)	(0.54)	(0.56)	(0.55)
ret1y	0.015	-0.051	-0.052	-0.053	-0.048	0.037	0.019	0.014	0.012	0.011
	(0.74)	(-1.13)	(-1.51)	(-1.47)	(-1.36)	(1.09)	(0.37)	(0.29)	(0.24)	(0.22)
avgturnover	0.257***	0.353***	0.320***	0.305***	0.292***	0.290***	0.319***	0.316***	0.313***	0.309***
	(10.34)	(5.92)	(5.71)	(5.43)	(5.02)	(14.56)	(13.01)	(15.10)	(14.47)	(15.00)
cvturnover	0.025**	0.213***	0.258***	0.272***	0.279***	-0.011	0.131***	0.178***	0.193***	0.198***
	(2.04)	(10.57)	(11.28)	(11.11)	(10.95)	(-1.57)	(7.15)	(8.22)	(8.30)	(8.32)
dispeps1w	-0.004	0.041**	0.037**	0.036**	0.034**	-0.005	0.055***	0.056***	0.055***	0.052***
	(-0.32)	(2.46)	(2.37)	(2.36)	(2.22)	(-0.39)	(2.79)	(2.80)	(2.77)	(2.59)
investment	0.030*	0.054***	0.065***	0.063***	0.062***	0.049***	0.053***	0.053***	0.053***	0.054***
	(1.82)	(3.27)	(4.02)	(3.79)	(3.69)	(3.33)	(4.08)	(4.39)	(4.54)	(4.69)
expgrthw	0.110***	0.206***	0.175***	0.172***	0.167***	0.079***	0.077***	0.076***	0.074***	0.074***
	(5.24)	(5.75)	(5.96)	(5.96)	(5.80)	(5.71)	(4.99)	(5.48)	(5.25)	(5.38)
zscorew	-0.022	-0.004	-0.032	-0.035	-0.031	-0.064***	-0.005	-0.006	-0.006	-0.006
	(-1.50)	(-0.14)	(-1.18)	(-1.22)	(-1.11)	(-4.13)	(-0.25)	(-0.35)	(-0.35)	(-0.31)
sdroa5yw	0.234***	0.308***	0.302***	0.295***	0.283***	0.238***	0.145***	0.147***	0.147***	0.146***
	(8.56)	(6.09)	(6.08)	(6.02)	(6.01)	(14.83)	(6.00)	(7.06)	(7.31)	(7.54)
inv_basew	-0.038***	-0.051***	-0.047***	-0.049***	-0.049***	-0.051***	-0.045***	-0.044***	-0.044***	-0.044***
	(-4.03)	(-5.18)	(-4.88)	(-4.95)	(-4.96)	(-3.51)	(-4.14)	(-4.13)	(-4.17)	(-4.18)
Constant	1.912***	1.961***	2.178***	2.278***	2.327***	2.583***	3.390***	3.619***	3.579***	3.623***
	(11.27)	(7.22)	(8.70)	(8.88)	(8.95)	(13.74)	(16.05)	(17.32)	(16.51)	(16.82)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6134	6150	6150	6150	6150	8666	8820	8820	8820	8820
Number of firms	664	666	666	666	666	2317	2362	2362	2362	2362
R-squared	0.695	0.717	0.714	0.707	0.703	0.593	0.598	0.606	0.604	0.605

Note:

Table 2.8 presents results from regressions of the risk measures on the strengths and concerns of the individual dimensions of SP as well as control variables over the period 1991–2007 for the whole sample as well as for the two subsamples based on S&P500 membership. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively.

The strengths and concerns of the individual dimensions of SP are Community strengths (STR_COM), Community concerns (CON_COM), Diversity strengths (STR_DIV), Diversity concerns (CON_DIV), Employee strengths (STR_EMP), Employee concerns (CON_EMP), Environment strengths (STR_ENV), Environment concerns (CON_ENV), Human Rights strengths (STR_HUM), Human Rights concerns (CON_HUM), Product strengths (STR_PRO), Product concerns (CON_PRO), Corporate Governance strengths (STR_GOV), and Corporate Governance concerns (CON_GOV), respectively. Human Rights strengths (STR_HUM) are excluded. All variables are defined in footnotes of Table 2.3.

Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm and time) t-Statistics are reported in parentheses. We use the two-way cluster robust standard error approach of Petersen (2009).

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

When splitting the sample based on S&P500 membership, Human Rights concerns and Corporate Governance strengths are no longer related to firm risk for both subsamples. For S&P500 firms, Employee relations, Diversity and Corporate Governance concerns are significantly and positively related to firm's idiosyncratic risk and total risk. Community strengths are now significantly and negatively related to firm's idiosyncratic risk and total risk, whereas Diversity strengths are significantly and positively related to firm's idiosyncratic risk.

The relation between strengths and concerns of SP dimensions is less pronounced for non S&P500 firms relative to S&P500 firms. Similar to their S&P500 counterparts, Employee relations concerns and Diversity strengths are significantly and positively related to firm's risk. However, Environment strengths are significantly and negatively related to total firm's risk for non S&P500 firms.

Overall, the results for the whole sample highlight two main conclusions. First, Employee, Diversity, Corporate Governance and Human Rights concerns positively affect firm's risk. Second, Diversity and Corporate Governance strengths positively affect firm's risk. There is also evidence that Environment strengths (Product concerns) negatively (positively) affect firm's risk. When splitting the sample based on S&P500 membership, the results reported in Table 2.8 show that some relationships between firm risk and strengths and concerns of SP dimensions found for the whole sample are lost, whereas other relationships remain valid for one or both subsamples. This observation implies that the two groups of firms, which exhibit differences in several aspects, should be treated separately. It could be argued that members of the S&P500 index are larger firms, less risky, highly visible for media and analysts suggesting that they have more transparency practices regarding their SP actions and impacts. Therefore, one could argue that S&P500 firms have less information asymmetry relative to non S&P500 firms, and consequently the relation between firm's risk and strengths and concerns of SP dimensions is more pronounced for S&P500 firms relative to non S&P500 firms. Our result is consistent with this conjecture. For S&P500 firms, concerns of Employee relations, Diversity and Corporate Governance positively affect firm's risk. Also, Community (Diversity) strengths negatively (positively) affect firm's risk for S&P500 firms. For non S&P500 firms, Employee relations concerns and Diversity strengths positively affect firm's risk, whereas Environment strengths negatively affect firm's risk.

2.5.4. Robustness Checks

2.5.4.1. Alternative measures of social performance

Using KLD strengths and concerns for the Environment dimension, Fernando *et al.* (2009) categorize firms into four groups: green, toxic, gray and neutral. Green (toxic) firms have only strengths (concerns). Gray firms have both strengths and concerns, whereas neutral firms do not have either strengths or concerns. This classification has the advantage to isolate the "substitution effect" within the same SP dimension[61] which is captured by Gray firms,

[61] Godfrey *et al.* (2008) suggest a potential "substitution effect" across SP dimensions.

i.e., those firms having both strengths and concerns along the same SP dimension. We use these measures for each SP dimensions as a robustness test for our strengths and concerns measures. Table 2.9 reports the results for both subsamples based on S&P500 membership.

Table 2.9: Relation between the risk measures and the alternative measures of SP dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
com_green	-0.024	-0.048***	-0.039**	-0.041**	-0.042**	-0.036	-0.098	-0.095	-0.100	-0.099
	(-1.60)	(-2.72)	(-2.25)	(-2.32)	(-2.37)	(-0.67)	(-1.49)	(-1.40)	(-1.45)	(-1.43)
com_toxic	-0.010	0.026	0.028	0.015	0.010	-0.040	0.069	0.072	0.078	0.075
	(-0.27)	(0.66)	(0.79)	(0.39)	(0.27)	(-0.63)	(1.32)	(1.24)	(1.32)	(1.28)
com_amb	-0.015	0.015	0.018	0.014	0.013	0.206**	0.031	0.096	0.110	0.124
	(-0.38)	(0.32)	(0.40)	(0.30)	(0.30)	(2.06)	(0.33)	(1.01)	(1.07)	(1.04)
div_green	-0.002	0.026	0.034	0.037	0.038	0.043	0.018	0.022	0.023	0.023
	(-0.13)	(0.93)	(1.24)	(1.38)	(1.42)	(1.35)	(0.73)	(0.96)	(0.96)	(0.99)
div_toxic	0.061**	0.089**	0.082**	0.080**	0.078**	0.050	0.011	0.017	0.019	0.020
	(2.07)	(2.35)	(2.23)	(2.14)	(2.04)	(1.61)	(0.57)	(0.94)	(0.99)	(1.05)
div_amb	0.065*	0.076*	0.076*	0.079**	0.083**	0.168**	0.069	0.081*	0.079*	0.085**
	(1.83)	(1.90)	(1.95)	(2.00)	(2.09)	(2.49)	(1.43)	(1.77)	(1.79)	(1.96)
emp_green	0.034	0.010	0.012	0.010	0.012	-0.021	0.030	0.034	0.034	0.034
	(1.54)	(0.40)	(0.53)	(0.45)	(0.53)	(-0.62)	(0.80)	(0.90)	(0.89)	(0.90)
emp_toxic	0.039*	0.079***	0.082***	0.085***	0.083***	0.072**	0.072***	0.068***	0.067***	0.067***
	(1.74)	(2.73)	(2.96)	(3.11)	(3.05)	(2.55)	(2.85)	(2.99)	(3.11)	(3.13)
emp_amb	0.108***	0.097**	0.080**	0.080**	0.077**	0.089**	0.103***	0.090***	0.090***	0.090***
	(3.47)	(2.36)	(2.15)	(2.18)	(2.16)	(2.21)	(3.12)	(2.82)	(2.67)	(2.65)
env_green	-0.041*	-0.085**	-0.079***	-0.079***	-0.075**	-0.089*	-0.137***	-0.099**	-0.087*	-0.078
	(-1.76)	(-2.50)	(-2.65)	(-2.63)	(-2.55)	(-1.90)	(-2.79)	(-2.03)	(-1.76)	(-1.53)
env_toxic	-0.049**	-0.090***	-0.097***	-0.103***	-0.102***	0.001	0.011	0.005	0.007	0.007
	(-2.00)	(-2.66)	(-2.91)	(-3.03)	(-3.02)	(0.03)	(0.37)	(0.19)	(0.24)	(0.25)
env_amb	-0.031	0.005	0.000	0.001	0.003	-0.008	-0.101	-0.124	-0.123	-0.112
	(-1.18)	(0.17)	(0.00)	(0.02)	(0.09)	(-0.14)	(-1.39)	(-1.64)	(-1.56)	(-1.41)

Table 2.9 (continued): Relation between the risk measures and the alternative measures of SP dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw
hum_green	0.077*	0.015	0.065	0.076**	0.084**	0.058	0.171	0.193	0.199	0.208
	(1.90)	(0.27)	(1.64)	(2.04)	(2.26)	(0.33)	(0.67)	(0.84)	(0.85)	(0.89)
hum_toxic	0.048	0.047	0.050	0.045	0.048	0.013	0.013	0.014	0.014	0.014
	(1.61)	(1.59)	(1.51)	(1.39)	(1.51)	(0.24)	(0.26)	(0.31)	(0.31)	(0.33)
hum_amb	0.077*	-0.039	0.021	0.033	0.039	0.098	0.065	-0.001	-0.002	-0.010
	(1.69)	(-0.59)	(0.40)	(0.66)	(0.77)	(0.73)	(0.33)	(-0.01)	(-0.01)	(-0.05)
pro_green	-0.017	0.029	0.030	0.037	0.037	0.050	0.035	0.043	0.043	0.045
	(-0.66)	(0.95)	(1.07)	(1.28)	(1.31)	(1.25)	(0.66)	(0.83)	(0.83)	(0.87)
pro_toxic	0.010	0.012	0.021	0.024	0.028	0.027	-0.049	-0.020	-0.013	-0.009
	(0.50)	(0.52)	(1.02)	(1.14)	(1.29)	(0.64)	(-1.43)	(-0.56)	(-0.37)	(-0.24)
pro_amb	0.049	0.019	0.051	0.060*	0.062*	0.375**	0.236	0.263	0.264	0.265
	(1.28)	(0.51)	(1.46)	(1.65)	(1.71)	(2.13)	(1.07)	(1.03)	(1.03)	(1.02)
gov_green	0.043	0.054	0.049	0.050	0.047	0.049	0.006	0.022	0.024	0.024
	(1.02)	(0.85)	(0.90)	(0.94)	(0.87)	(1.55)	(0.31)	(1.11)	(1.24)	(1.20)
gov_toxic	0.087***	0.121***	0.125***	0.128***	0.129***	-0.040*	-0.036	-0.028	-0.027	-0.027
	(4.53)	(4.18)	(4.71)	(4.61)	(4.67)	(-1.69)	(-1.35)	(-1.04)	(-0.96)	(-0.94)
gov_amb	0.077**	0.140**	0.132**	0.140**	0.140**	0.020	-0.016	0.009	0.021	0.024
	(2.22)	(2.37)	(2.51)	(2.55)	(2.51)	(0.32)	(-0.21)	(0.12)	(0.27)	(0.32)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6134	6150	6150	6150	6150	8666	8820	8820	8820	8820
Number of firms	664	666	666	666	666	2317	2362	2362	2362	2362
R-squared	0.692	0.719	0.715	0.709	0.704	0.593	0.598	0.606	0.604	0.605

Note:

Table 2.9 presents results from regressions of the risk measures on the alternatives measures of the individual dimensions of SP as well as control variables over the period 1991–2007 for the two subsamples based on S&P500 membership. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively.

The alternatives measures of the individual dimensions of SP are defined as follow. Following Fernando *et al.* (2009), for each SP dimension, firms are categorized into four groups: green, toxic, gray (or ambiguous) and neutral. Green (toxic) firms have only strengths (concerns). Gray (or ambiguous) firms have both strengths and concerns, whereas neutral firms do not have either strengths or concerns. We illustrate these measures using the Community dimension: com_green is a dummy equals 1 if the firm has only community strengths and zero otherwise; com_toxic is a dummy equals 1 if the firm has only community concerns and zero otherwise; com_amb is a dummy equals 1 if the firm has both strengths and concerns and zero otherwise. We do not include a dummy for neutral firms to avoid multicollinearity problem. The other SP dimensions are defined in the same way. Control variables are defined in footnotes of Table 2.3.

Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm and time) t-Statistics are reported in parentheses. We use the two-way cluster robust standard error approach of Petersen (2009).

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

Having only concerns (toxic) or both strengths and concerns (gray or ambiguous) along Employee relations, Diversity and Corporate Governance positively affect S&P500 firm's risk. Also, having only strengths (green) along Community (Human Rights) negatively (positively) affect firm's risk for S&P500 firms. Having only strengths (green) along Environment negatively affect firm's risk for both subsamples, although the effect is more significant for S&P500 firms.

For non S&P500 firms, having concerns (toxic) or both strengths and concerns (gray or ambiguous) along Employee relations and Diversity, respectively, positively affect firm's risk.

However, a somewhat surprising result is that having only concerns (toxic) along environment negatively affect S&P500 firm's risk. This result is contrary to our expectations and difficult to rationalize. One potential explanation is that environment concerns (e.g.,

climate change issues) may convey a mixed signal to the market. For example, Fernando *et al.* (2009) find that both "green" and "toxic" firms have a smaller institutional ownership relative to environmentally neutral firms. They also find that toxic firms have higher institutional ownership than green firms (i.e., institutional investors prefer toxic stocks to green stocks). Except the result for toxic firms along the environment dimension, all other results of Table 2.9 are in line with our previous findings and confirm our main conclusions.

2.5.4.2. Granger causality

In this section, we analyse whether the lags of SP dimensions influence firm risk or whether the lags of risk influence SP dimensions. Specifically, we examine the direction of the causation between firm risk and strengths and concerns of SP dimensions using the Granger causality test (Granger, 1969). This test focuses on lead-lag relationships, which do not necessarily correspond with standard notions of causation (Scholtens, 2008).[62] Generally speaking, the variable X is said to *Granger cause* the variable Y if, given the past values of Y, the past values of X are useful for predicting Y. If all coefficients on the lags of variable X are jointly statistically significant in the equation of the variable Y, we can conclude that X *Granger causes* Y, i.e., the causation runs from X to Y. It is possible that Granger causality runs in the other way, i.e., the causation may run from Y to X. It is also possible that Granger causality run in both directions. In this case, we have Y Granger causes X and X Granger causes Y (bi-directional causality).

In order to perform Granger causality test, we estimate the following vector autoregression (VAR) with three lags:

$$\begin{cases} Risk_{it} = \alpha_1 + \lambda_{11} Risk_{it-1} + \lambda_{12} Risk_{it-2} + \lambda_{13} Risk_{it-3} + \beta_{11} SP_{it-1} + \beta_{12} SP_{it-2} + \beta_{13} SP_{it-3} + \delta_1 X_{it-1} + \varepsilon_{it} \\ SP_{it} = \alpha_2 + \lambda_{21} Risk_{it-1} + \lambda_{22} Risk_{it-2} + \lambda_{23} Risk_{it-3} + \beta_{21} SP_{it-1} + \beta_{22} SP_{it-2} + \beta_{23} SP_{it-3} + \delta_2 X_{it-1} + \upsilon_{it} \end{cases}$$

[62] Some studies have examined the direction of the causation between financial performance and social performance using Granger causality test (e.g., Scholtens, 2008; Nelling and Webb, 2009).

where $Risk_{it}$ is the risk measure for firm i at time t, and SP_{it} is the strengths (or concerns) measure for firm i relative to each SP dimension at time t. X_{it-1} is as defined above. The VAR approach provides a framework for testing for Granger causality between each set of variables. For each equation in the VAR, we test the hypotheses that each of the other endogenous variables does not Granger-cause the dependent variable in that equation. For example, If the coefficients ($\beta_{11}, \beta_{12,}$ and β_{13}) are jointly significant (Wald test), then SP Granger causes Risk. Similarly, if the coefficients ($\lambda_{21}, \lambda_{22,}$ and λ_{23}) are jointly significant, then Risk Granger causes SP. If both set of coefficients are significant, then there is bi-directional causality between SP and Risk.

In order to apply the VAR approach in our context, we should take into account the heterogeneity of the cross-section units (i.e., firms fixed effects) and time effects. To do so, we follow the methodology used by Love and Zicchino (2006) which removes these effects before estimating the VAR. To remove the fixed effects from the data, we use the forward mean-differencing procedure which calculates the orthogonal deviation for each observation (i.e., difference between the observation and the forward mean using all available future observations for each firm-year). We also eliminate the time effects by subtracting from each firm-year observation, the corresponding yearly mean. These two transformations are applied for each variable. We first estimated the VAR on these transformed variables, and then construct the granger causality test from the estimated VAR coefficients.

Table 2.10: Granger causality between the risk measures and the SP dimensions

	All firms				
	Total risk		Idiosyncratic risk		
Null Hypothesis:	**Volatilityw**	**dvolatilityw**	**sdresCAPMw**	**sdresffw**	**sdres4ffw**
CON_COM does not Granger Cause RISK	0.01	0.81	0.58	0.80	0.84
RISK does not Granger Cause CON_COM	0.06	0.16	0.18	0.22	0.19
CON_DIV does not Granger Cause RISK	0.00	0.41	0.34	0.35	0.36
RISK does not Granger Cause CON_DIV	0.22	0.89	0.64	0.59	0.59
CON_EMP does not Granger Cause RISK	0.00	0.16	0.26	0.31	0.46
RISK does not Granger Cause CON_EMP	0.00	0.00	0.00	0.00	0.00
CON_ENV does not Granger Cause RISK	0.00	0.01	0.02	0.04	0.05
RISK does not Granger Cause CON_ENV	0.41	0.04	0.06	0.03	0.05
CON_HUM does not Granger Cause RISK	0.00	0.16	0.14	0.18	0.15
RISK does not Granger Cause CON_HUM	0.03	0.00	0.02	0.06	0.07
CON_GOV does not Granger Cause RISK	0.40	0.00	0.00	0.00	0.00
RISK does not Granger Cause CON_GOV	0.00	0.00	0.00	0.00	0.00
CON_PRO does not Granger Cause RISK	0.00	0.28	0.38	0.32	0.32
RISK does not Granger Cause CON_PRO	0.02	0.09	0.04	0.03	0.02
STR_COM does not Granger Cause RISK	0.00	0.06	0.00	0.00	0.00
RISK does not Granger Cause STR_COM	0.14	0.05	0.11	0.08	0.09
STR_DIV does not Granger Cause RISK	0.00	0.00	0.00	0.00	0.00
RISK does not Granger Cause STR_DIV	0.00	0.00	0.00	0.00	0.00
STR_EMP does not Granger Cause RISK	0.00	0.00	0.02	0.03	0.03
RISK does not Granger Cause STR_EMP	0.60	0.22	0.09	0.10	0.10
STR_ENV does not Granger Cause RISK	0.00	0.62	0.41	0.48	0.45
RISK does not Granger Cause STR_ENV	0.00	0.05	0.09	0.13	0.15
STR_GOV does not Granger Cause RISK	0.13	0.33	0.19	0.28	0.28
RISK does not Granger Cause STR_GOV	0.02	0.00	0.05	0.07	0.08
STR_PRO does not Granger Cause RISK	0.00	0.08	0.05	0.04	0.04
RISK does not Granger Cause STR_PRO	0.56	0.20	0.08	0.09	0.09
Observations	6307	6341	6341	6341	6341

Table 2.10 (continued): Granger causality between the risk measures and the SP dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
Null Hypothesis:	**Volatilityw**	**dvolatilityw**	**sdresCAPMw**	**sdresffw**	**sdres4ffw**	**Volatilityw**	**dvolatilityw**	**sdresCAPMw**	**sdresffw**	**sdres4ffw**
CON_COM does not Granger Cause RISK	0.50	0.89	0.74	0.72	0.78	0.01	0.04	0.07	0.06	0.06
RISK does not Granger Cause CON_COM	0.02	0.12	0.20	0.31	0.29	0.94	0.83	0.74	0.77	0.76
CON_DIV does not Granger Cause RISK	0.84	0.24	0.33	0.38	0.36	0.00	0.98	0.98	0.97	0.95
RISK does not Granger Cause CON_DIV	0.01	0.22	0.32	0.34	0.34	0.04	0.77	0.75	0.73	0.72
CON_EMP does not Granger Cause RISK	0.00	0.01	0.11	0.15	0.24	0.02	0.99	0.94	0.92	0.90
RISK does not Granger Cause CON_EMP	0.00	0.00	0.00	0.00	0.00	0.04	0.37	0.34	0.36	0.35
CON_ENV does not Granger Cause RISK	0.00	0.02	0.02	0.03	0.04	0.02	0.15	0.19	0.23	0.21
RISK does not Granger Cause CON_ENV	0.63	0.05	0.11	0.08	0.11	0.28	0.80	0.63	0.53	0.58
CON_HUM does not Granger Cause RISK	0.00	0.13	0.12	0.12	0.09	0.00	0.11	0.24	0.20	0.19
RISK does not Granger Cause CON_HUM	0.41	0.07	0.24	0.35	0.39	0.27	0.00	0.00	0.00	0.01
CON_GOV does not Granger Cause RISK	0.00	0.00	0.00	0.00	0.00	0.24	0.01	0.00	0.00	0.00
RISK does not Granger Cause CON_GOV	0.80	0.00	0.00	0.00	0.00	0.04	0.03	0.03	0.02	0.03
CON_PRO does not Granger Cause RISK	0.00	0.89	0.80	0.74	0.72	0.00	0.02	0.12	0.18	0.17
RISK does not Granger Cause CON_PRO	0.06	0.18	0.10	0.08	0.07	0.04	0.33	0.22	0.17	0.14
Observations	3842	3859	3859	3859	3859	2103	2116	2116	2116	2116

Table 2.10: (continued): Granger causality between the risk measures and the SP dimensions

	S&P500 firms					Non S&P500 firms				
	Total risk		Idiosyncratic risk			Total risk		Idiosyncratic risk		
Null Hypothesis:	**Volatilityw**	**dvolatilityw**	**sdresCAPMw**	**sdresffw**	**sdres4ffw**	**Volatilityw**	**dvolatilityw**	**sdresCAPMw**	**sdresffw**	**sdres4ffw**
STR_COM does not Granger Cause RISK	0.00	0.37	0.13	0.14	0.13	0.00	0.02	0.01	0.027	0.02
RISK does not Granger Cause STR_COM	0.75	0.30	0.36	0.29	0.28	0.38	0.89	0.90	0.925	0.92
STR_DIV does not Granger Cause RISK	0.00	0.00	0.00	0.00	0.00	0.06	0.31	0.37	0.435	0.38
RISK does not Granger Cause STR_DIV	0.00	0.00	0.00	0.00	0.00	0.28	0.12	0.10	0.117	0.09
STR_EMP does not Granger Cause RISK	0.00	0.18	0.52	0.39	0.38	0.03	0.00	0.00	0.002	0.00
RISK does not Granger Cause STR_EMP	0.11	0.90	0.74	0.82	0.82	0.79	0.76	0.70	0.666	0.66
STR_ENV does not Granger Cause RISK	0.00	0.47	0.27	0.24	0.21	0.45	0.02	0.07	0.082	0.08
RISK does not Granger Cause STR_ENV	0.98	0.00	0.00	0.00	0.00	0.73	0.25	0.28	0.264	0.25
STR_GOV does not Granger Cause RISK	0.87	0.04	0.01	0.02	0.03	0.35	0.24	0.30	0.301	0.25
RISK does not Granger Cause STR_GOV	0.16	0.00	0.00	0.00	0.00	0.05	0.22	0.20	0.211	0.23
STR_PRO does not Granger Cause RISK	0.00	0.00	0.00	0.00	0.00	0.45	0.17	0.25	0.280	0.27
RISK does not Granger Cause STR_PRO	0.06	0.65	0.48	0.46	0.47	0.51	0.80	0.46	0.480	0.42
Observations	3842	3859	3859	3859	3859	2103	2116	2116	2116	2116

Note:

Table 2.10 presents the probabilities of the Granger causality tests between the risk measures and the strengths and concerns of the individual dimensions of SP over the period 1991–2007 for the whole sample as well as for the two subsamples based on S&P500 membership.

Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Firm's total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively.

The strengths and concerns of the individual dimensions of SP are Community strengths (STR_COM), Community concerns (CON_COM), Diversity strengths (STR_DIV), Diversity concerns (CON_DIV), Employee strengths (STR_EMP), Employee concerns (CON_EMP), Environment strengths (STR_ENV), Environment concerns (CON_ENV), Human Rights strengths (STR_HUM), Human Rights concerns (CON_HUM), Product strengths (STR_PRO), Product concerns (CON_PRO), Corporate Governance strengths (STR_GOV), and Corporate Governance concerns (CON_GOV), respectively. Human Rights strengths (STR_HUM) are excluded. All variables are defined in footnotes of Table 2.3.

The Granger causality tests are constructed from the estimated coefficients of the vector autoregression (VAR) with three lags. The VAR is estimated using transformed variables in order to remove the fixed effects and time effects from the data. To remove the fixed effects, we use the forward mean-differencing procedure which subtracts the forward mean, i.e. the mean of all future observations available for each firm-year observation. We also eliminate the time effects by subtracting from each firm-year observation, the corresponding yearly mean. For each equation in the VAR, we test the hypotheses that each of the other endogenous variables does not Granger-cause the dependent variable in that equation.

Table 2.10 reports the probabilities of the Granger causality tests. For the whole sample, there appears to be a unidirectional causality from firm's risk to Employee, Human Rights and Product concerns. There is also a bi-directional causality between firm's risk and Corporate Governance and Environment concerns. As for the strengths, Community, Employee and Product strengths Granger cause firm's risk. Also, there appears to a bi-directional causality between firm's risk and diversity strengths. There is also evidence of a unidirectional causality from firm's risk to Environment and Corporate Governance strengths.

When splitting the whole sample based on S&P500 membership, Table 10 shows different patterns between the two subsamples. The only exception is the bi-directional causality between firm's risk and Corporate Governance concerns which hold for both subsamples. As for the S&P500 firms, firm's risk Granger causes Employee concerns,

whereas Environment concerns Granger cause firm's risk. As for non S&P500 firms, firm's risk Granger causes Human Rights concerns, whereas Community concerns Granger cause firm's risk.

As for the strengths, there are also differences between the two groups. For the S&P500 firms, there are two bidirectional causalities between firm's risk and Diversity and Corporate Governance strengths, respectively. Furthermore, firm's risk Granger causes Environment strengths, whereas Product strengths Granger cause firm's risk. However, Community and Employee strengths Granger cause firm's risk for non S&P500 firms.

Overall, consistent with the findings of Scholtens (2008) for the relation between SP dimensions and financial performance, the direction of causation tends to vary along the different SP dimensions which do not all have the same type of interaction with risk. There is some bidirectional causality as well as some unidirectional causality in both directions.

2.6. Conclusion

This paper examines whether the individual dimensions of SP affect firm's risk (total and idiosyncratic) using a large panel dataset of 16,599 firm-year observations over the period 1991-2007. Using measures of SP dimensions which combine strengths and concerns, we find that not all SP dimensions are relevant for firm risk. For the whole sample, only two dimensions (Employee relations and Human Rights) are negatively related to firm risk. When splitting the sample based on S&P500 membership, we find that Employee relations, Corporate Governance and Community negatively affect firm risk, whereas Environment positively affects firm risk for S&P500 firms. For non S&P500 firms, only Employee relations, Community and Environment affect negatively firm risk. The other dimensions (Diversity, Human Rights, and Product) do not impact significantly firm risk for both subsamples.

Using measures of SP dimensions which separate strengths and concerns, we draw two main conclusions from our analysis for the whole sample. First, Employee, Diversity, Corporate Governance and Human Rights concerns positively affect firm's risk. Second, Diversity and Corporate Governance strengths positively affect firm's risk. When splitting the sample based on S&P500 membership, we find that Employee relations, Diversity and Corporate Governance concerns positively affect firm's risk, whereas Community (Diversity) strengths negatively (positively) affect firm's risk for S&P500 firms. For non S&P500 firms, Employee relations concerns and Diversity strengths positively affect firm's risk, whereas Environment strengths negatively affect firm's risk. Finally, we examine whether there is a casual link between firm's risk and strengths and concerns of SP dimensions. We find that the direction of the causation tend to vary along the different SP dimensions.

Our findings regarding the positive impact on firm risk of Employee, Diversity and Corporate Governance concerns are consistent with the theoretical models of the relationship between SP and expected returns (e.g., Heinkel *et al.,* 2001; Barnea *et al.,* 2005; Mackey *et al.,* 2007; Fama and French, 2007). For example, regardless of their investment preferences, socially responsible investors and traditional investors will be affected more by the concerns

which affect their expectations about the moments of cash flows, such as the increased risk of boycott and damage to firm brand and reputation as a result of negative campaigns by the media and NGOs.

Unlike concerns, the impact of the strengths on firm risk is not uniform and depends on the individual dimension examined. The finding regarding the negative impact on firm risk of Community and Environment strengths is consistent with the stakeholder theory and the risk management argument suggesting that it pays to be perceived as more socially responsible in the sense that firms with higher strengths along these dimensions are perceived as being less risky investments. The finding regarding the positive impact on firm risk of Diversity strengths support the argument of "the managerial opportunism hypothesis" in which managers may over-invest in CSR activities (i.e., strengths) for their private benefit (i.e., to improve their reputations as good social citizens to gain stakeholders' support), even at the expense of shareholders (Barnea and Rubin, 2010; Cespa and Cestone, 2007). The different impacts of the strengths on firm risk might be attributable to the fact that market participants (investors and analysts) do not agree on the value of the strengths and their impacts on cash flows (see e.g., Ioannou and Serafeim, 2010; Edmans, 2011).

Our results might have important implications for investors and corporate managers. As for investors, our results might help to tailor portfolios construction according to investors' needs, and taking into account the impact of SP dimensions on the risk of these portfolios. They might also help institutional investors to maximize the integration of ESG criteria in order to better manage risk in their portfolios. As for firms, it would be rational for firm's managers to improve their SP (especially those dimensions that affect risk) and integrate it into their overall strategy. CEOs believe that sustainability issues should be fully integrated into the strategy and operations of a company (Lacy *et al.,* 2010). This may enlarge the firm's investor base by attracting more socially responsible investors, e.g., social norm-constrained institutional investors such as pension funds. In this paper, we examine the impact that may have SP dimensions on firm risk in the U.S context. It might be fruitful for future research to examine this issue using SP measures other than KLD ratings and to extend our study to other contexts. It could also be interesting to examine the effects of the recent financial crisis on the SP-Risk relation.

APPENDIX 2.1

MSCI ESG STATS (KLD)'S STRENGTH AND CONCERN RATINGS

Appendix 2.1 : MSCI ESG STATS (KLD)'s Strength and Concern Ratings

Dimension	Strengths	Concerns
Community	- Charitable Giving - Innovative Giving - Non-US Charitable Giving - Support for Housing - Support for Education - Indigenous Peoples Relations - Volunteer Programs - Other Strength	- Investment Controversies - Negative Economic Impact - Indigenous Peoples Relations - Tax Disputes - Other Concern
Diversity	- CEO's identity - Promotion - Board of Directors - Work/Life Benefits - Women & Minority Contracting - Employment of the Disabled - Gay & Lesbian Policies - Other Strength	- Controversies (e.g., fines) - Non-Representation - Other Concern
Employee Relations	- Union Relations - No-Layoff Policy - Cash Profit Sharing - Employee Involvement - Retirement Benefits Strength - Health and Safety Strength - Other Strength	- Union Relations - Health and Safety Concern - Workforce Reductions - Retirement Benefits Concern - Other Concern
Environment	- Beneficial Products and Services - Pollution Prevention - Recycling - Clean Energy - Communications - Property, Plant, and Equipment - Management Systems - Other Strength	- Hazardous Waste - Regulatory Problems - Ozone Depleting Chemicals - Substantial Emissions - Agricultural Chemicals - Climate Change - Other Concern
Product	- Quality - R&D/Innovation - Benefits to Economically Disadvantaged - Other Strength	- Product Safety - Marketing/Contracting Concern - Antitrust - Other Concern
Human Rights	- Positive Record in South Africa (1994-1995) - Indigenous Peoples Relations Strength - Labor Rights Strength - Other Strength	- South Africa (1991-1994) - Northern Ireland (1991-1994) - Burma Concern - Mexico (1995-2002) - Labor Rights Concern - Indigenous Peoples Relations Concern - Other Concern
Corporate Governance	- Limited Compensation - Ownership Strength - Transparency Strength - Political Accountability Strength - Other Strength	- High Compensation - Ownership Concern - Accounting Concern - Political Accountability Concern - Transparency Concern - Other Concern

REFERENCES

Alexander, C., Sheedy, E. 2004. *The Professional Risk Managers' Handbook: A Comprehensive Guide to Current Theory and Best Practices*. The Professional Risk Managers' International Association.

Altman, E. 1993. *Corporate financial distress and bankruptcy*. John Wiley and Sons, New York.

Ang, A., Hodrick, R. J., Xing, Y., and Zhang, X. (2006), «The Cross-Section of Volatility and Expected Returns», *Journal of Finance*, 61, 259–299.

Barnea, A., Heinkel. R., and Kraus, A. (2005), «Green investors and corporate investment», *Structural Change and Economic Dynamics*, 16, 332–346.

Barnea, A., and Rubin, A. (2010), «Corporate social responsibility as a conflict between shareholders», *Journal of Business Ethics*, 97, 71–86.

Barnett, M.L, and Salomon, R.M. (2006), «Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance», *Strategic Management Journal*, 27, 1101-1122.

Baron, D., Harjoto, M., and Jo, H. (2011), «The economics and politics of corporate social performance», *Business and Politics*, 13, 1–46.

Bates, T.W., Kahle, K.M., and Stulz, R. (2009), «Why do U.S. firms hold so much more cash than they used to? », *Journal of Finance*, 64, 1985–2021.

Bauer, R., Derwall, J., and Hann, D. (2009), «Employee Relations and Credit Risk», Available at SSRN: http://ssrn.com/abstract=1483112

Berk, J., Green, R.C., and Naik, V. (1999), «Optimal investment, growth options, and security returns», *Journal of Finance*, 54, 1553–1607.

Berman, S.L., Wicks, A.C., Kotha, S., and Jones, T.M. (1999), «Does Stakeholder Orientation Matter? The Relationship between Stakeholder Management Models and Firm Financial Performance», *Academy of Management Journal*, 42, 488-506.

Bird, R., Hall, A., Momentè, F., and Reggiani, F. (2007), «What Corporate Social Responsibility Activities are Valued by the Market? », *Journal of Business Ethics*, 76, 189–206.

Botosan, C.A., and Plumlee, M.A. (2005). «Assessing alternative proxies for the expected risk premium», *The Accounting Review*, 80, 21-53.

Boutin-Dufresne, and F., Savaria, P. (2004), «Corporate social responsibility and financial risk», *Journal of Investing*, 13, 57-66.

Brammer, S., Brooks, C., and Pavelin, S. (2006), «Corporate Social Performance and Stock Returns: UK Evidence from Disaggregate Measures», *Financial Management*, 35, 97-116.

Brennan, M.J., Chordia, T., and Subrahmanyam, A. (1998), «Alternative factor specifications, security characteristics, and the cross-section of expected stock returns», *Journal of Financial Economics*, 49, 345-373.

Carhart, M.M. (1997), «On persistence in mutual fund performance», *Journal of Finance*, 52, 57-82.

Carlson, M., Fisher, A., and Giammarino, R. (2004), «Corporate investment and asset price dynamics: Implications for the cross-section of returns», *Journal of Finance*, 59, 2577–2603.

Carlson, M., Fisher, A., and Giammarino, R. (2006), «Corporate investment and asset price dynamics: Implications for SEO event studies and long-run performance», *Journal of Finance*, 61, 1009-1034.

Carroll, A.B. (1979), «A three-dimensional conceptual model of corporate performance», *The Academy of Management Review*, 4, 497-505.

Carroll, A.B. (1999), «Corporate social responsibility: evolution of a definitional construct», *Business and Society*, 38, 268-295.

Cespa, G., and Cestone, G. (2007), «Corporate social responsibility and managerial entrenchment», *Journal of Economics and Management Strategy*, 16, 741-771.

Chatterji, A., Levine, D.I., and Toffel, M.W. (2009), «How well do social ratings actually Measure corporate social responsibility? », *Journal of Economics and Management Strategy*, 18, 125-169.

Chordia, T., Subrahmanyam, A., and Anshuman, R. (2001), «Trading activity and expected stock returns», *Journal of Financial Economics*, 59, 3-32.

Derwall, J. and Verwijmeren, P. (2007), «Corporate Social Responsibility and the Implied Cost of Equity Capital», Working paper, RSM Erasmus University.

Dhaliwal, D.S., Li, O.Z., Tsang, A.H., and Yang, Y.G. (2010), «Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting», *The Accounting Review*, in press. doi: 10.2308/accr.00000005.

Edmans, A. (2011), «Does the stock market fully value intangibles? Employee satisfaction and equity prices», *Journal of Financial Economics*, in press. doi:10.1016/j.jfineco.2011.03.021.

El Ghoul, S., Guedhami, O., Kwok, C., and Mishra, D. (2011), «Does corporate social responsibility affect the cost of capital? », *Journal of Banking and Finance*, in press. doi:10.1016/j.jbankfin.2011.02.007.

Fama, E.F., and French, K.R. (1992), «The cross-section of expected stock returns», *Journal of Finance*, 47, 427-465.

Fama, E.F., and French, K.R. (1993), «Common risk factors in the returns on stocks and bonds», *Journal of Financial Economics*, 33, 3-56.

Fama, E.F., and French. K.R. (1997), «Industry cost of equity. *Journal of Financial Economics*, 43, 153-193.

Fama, E.F., and French, K.R. (2007), «Disagreement, tastes and asset prices», *Journal of Financial Economics*, 83, 667-689.

Fangjian, F. (2009), «Idiosyncratic risk and the cross-section of expected stock returns», *Journal of Financial Economics*, 91, 24-37.

Feldman, J., Soyka, P., and Ameer, P. (1997), «Does improving a firm's environmental management system and environmental performance result in a higher stock price? », *Journal of Investing*, 6, 87-97.

Fernando, C.S., Sharfman, M.P., and Uysal V.B. (2009), «Does Greenness Matter? The Effect of Corporate Environmental Performance on Ownership Structure, Analyst Coverage and Firm Value», Working Paper, University of Oklahoma.

Gebhardt, W., Lee, C., and Swaminathan, B. (2001), «Toward an implied cost of capital», *Journal of Accounting Research*, 39, 135-176.

Godfrey, P.C., Hatch. N.W., and Hansen, J.M. (2008), «Toward a General Theory of CSRs: The Roles of Beneficence, Profitability, Insurance, and Industry Heterogeneity», *Business and Society*, doi: 10.1177/0007650308315494.

Godfrey, P.C., Merrill. C.B., and Hansen, J.M. (2009), «The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis», *Strategic Management Journal*, 30, 425-445.

Goss, A. (2012), «Corporate social performance and idiosyncratic risk: a variance decomposition analysis», 2012 Midwest Finance Association Annual Meeting (Midwest Finance Association).

Goyal, A., and Santa-Clara, P. (2003), «Idiosyncratic Risk Matters! », *Journal of Finance*, 58, 975–1008.

Granger, C. W. J. (1969), «Investigating causal relations by econometric models and cross-spectral methods», *Econometrica*, 37, 424–438.

Griffin, J.J., and Mahon, J.F. (1997), «The corporate social performance and corporate financial performance debate: Twenty-five years of incomparable research», *Business and Society*, 36, 5-31.

Harjoto, M.A., and Jo, H. (2008), «Corporate social responsibility and operating performance», *Journal of the Academy of Business and Economics*, 8, 59-71.

Harjoto, M.A., and Jo, H. (2011), «Corporate governance and CSR nexus», *Journal of Business Ethics*, in press. doi: 10.1007/s10551-011-0772-6.

Heinkel, R., Kraus, A., and Zechner. J. (2001), «The effect of green investment on corporate behavior», *Journal of Financial and Quantitative Analysis*, 36, 431-449.

Hillman, A., and Keim, G.D. (2001), «Shareholder value, stakeholder management, and social issues: What's the bottom line? », Strategic *Management Journal*, 22, 125-139.

Hong, H., and Kacperczyk, M. (2009), «The price of sin: The effects of social norms on markets», *Journal of Financial Economics*, 93, 15–36.

Ioannou, I., and Serafeim, G. (2010), «The impact of corporate social responsibility on investment recommendations», Working paper, Harvard Business School.

Jo, H., and Harjoto, M.A. (2012), «The Causal Effect of Corporate Governance on Corporate Social Responsibility», *Journal of Business Ethics*, 106, 53-72.

Johnson, R.D., and Greening, D.W. (1999), «The effects of corporate governance and institutional ownership types on corporate social performance», *Academy of Management Journal*, 42, 564–576.

Kane, G. D., Velury, U., and Ruf, B. M. (2005), «Employee Relations and the Likelihood of Occurrence of Corporate Financial Distress», *Journal of Business Finance & Accounting*, 32, 1083-1105.

Lacy, P., Cooper, T., Hayward, R., and Neuberger, L. (2010). «A New Era of Sustainability - UN Global Compact-Accenture CEO Study 2010», Available at: http://www.accenture.com/us-en/Pages/insight-un-global-compact-reports.aspx

Lee, D.D., and Faff, R.W. (2009), «Corporate sustainability performance and idiosyncratic risk: A global perspective», *The Financial Review*, 44, 213-237.

Love, I., and Zicchino, L. (2006), «Financial development and dynamic investment behavior: Evidence from panel VAR», *The Quarterly Review of Economics and Finance*, 46, 190–210.

Luo, X., and Bhattacharya, C.B. (2009), «The Debate over Doing Good: Corporate Social Performance, Strategic Marketing Levers, and Firm-idiosyncratic Risk», *Journal of Marketing*, 73, 198-213.

Mackey, A., Mackey, T.B., and Barney, J.B. (2007), «Corporate social responsibility and firm performance: Investor preferences and corporate strategies», *Academy of Management Review*, 32, 817 – 835.

Margolis, J.D., and Walsh, J.P. (2003), «Misery loves companies: rethinking social initiatives by business», *Administrative Science Quarterly*, 48, 268-305.

Mattingly, J.E., and Berman, S.L. (2006), «Measurement of corporate social action: Discovering taxonomy in the Kinder Lydenberg Domini Ratings Data», *Business and Society*, 45, 20-46.

McGuire, J., Dow, S., and Argheyd, K. (2003), «CEO incentives and corporate social performance», *Journal of Business Ethics*, 45, 341-359.

McGuire, J.B., Sundgren, A., and Schneeweis, T. (1988), «Corporate social responsibility and Firm financial performance», *Academy of Management Journal*, 31, 854-872.

Merton, R. C. (1987), «A simple model of capital market equilibrium with incomplete information», *Journal of Finance*, 42, 483–510.

Nelling, E., and Webb, E. (2009), «Corporate social responsibility and financial performance: the ''virtuous circle'' revisited», *Review of Quantitative Finance and Accounting*, 32, 197–209.

Oikonomou, I., Brooks, C., and Pavelin, S. (2012), «The impact of corporate social performance on financial risk and utility: A longitudinal analysis», *Financial Management*, 41, 483–515.

Orlitzky, M., and Benjamin J.D. (2001), «Corporate social performance and firm risk: A meta-analytic review», *Business and Society*, 40, 369-396.

Orlitzky, M., Schmidt F.L., and Rynes S.L. (2003), «Corporate social and financial performance: A meta-analysis», *Organization Studies*, 24, 403-441.

Petersen, M. A. (2009), «Estimating standard errors in finance panel data sets: Comparing approaches», *Review of Financial Studies*, 22, 435–480.

Preston, L.E., and O'Bannon, D.P. (1997), «The corporate social-financial performance relationship», *Business and Society*, 36, 419-429.

Rehbein, K., Waddock, S.A., and Graves, S. B. (2004), «Understanding shareholder activism: Which corporations are targeted? », *Business and Society*, 43, 239-267.

Rivoli, P. (2003), « Labor standards in the global economy: Issues for investors», *Journal of Business Ethics*, 43, 223–232.

Salama, A., Anderson, K., and Toms, J.S. (2011), «Does community and environmental responsibility affect firm risk: Evidence from UK panel data 1994-2006», *Business Ethics: A European Review*, 20, 192-204.

Scholtens, B. (2008), «A note on the interaction between corporate social responsibility and financial performance», *Ecological Economics*, 68, 46 - 55.

Sharfman, M.P., and Fernando, C.S. (2008), «Environmental risk management and the cost of capital», *Strategic Management Journal*, 29, 569-592.

Shleifer, A., and Vishny, R. W. (1997), «The Limits of Arbitrage», *Journal of Finance*, 52, 35-55.

Social Investment Forum (SIF), (2010), «Report on Socially Responsible Investing Trends in the United States. http://www.ussif.org/

Stultz, R. M. 2002. *Risk management and derivatives*. Southwestern College Publications, New York.

Waddock, S.A. (2003), «Myths and realities of social investing», *Organization and Environment*, 16, 369-380.

Waddock, S.A., and Graves, S.B. (1997), «The corporate social performance-financial performance link», *Strategic Management Journal*, 18, 303-319.

Wood, D.J. (1991), «Corporate social performance revisited», *Academy of Management Review*, 16, 691-718.

CHAPITRE III

ARTICLE 3

DOES SOCIAL PERFORMANCE AFFECT THE RISK OF FINANCIAL FIRMS?

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DOES SOCIAL PERFORMANCE AFFECT THE RISK OF FINANCIAL FIRMS?

Abstract

This paper examines the impact of social performance (SP) on the financial firm's risk (total, idiosyncratic, systematic and tail). We find that the aggregate measure of SP (concerns) is significantly and negatively (positively) related to a financial firm's risk. Only some SP dimensions significantly affect the risk of financial firms. Specifically, Employee, Product and Corporate Governance concerns positively affect total risk, idiosyncratic risk, systematic risk, and the Value at Risk (VaR), whereas Product strengths positively affect the VaR. Additional analysis shows that SP affects the risk of banks and trading firms, but not insurance firms.

Keywords: Financial firms, Volatility, Value at Risk, Social performance, Strengths, Concerns.

3.1. Introduction

Financial institutions are an essential ingredient for the economy because of their role as financial intermediaries and capital providers. The failure of financial institutions, particularly those considered by the recent Basel Committee on Banking Supervision reforms (Basel III) as global and systemically important financial institutions (i.e., too-big-to-fail), can damage the economy domestically and globally. Because of this systemic risk, financial institutions are increasingly subject to more stringent regulations at the national and global level (Jorion, 2003). At the global level, the Basel Committee on Banking Supervision (BCBS) has established minimum risk-based capital standards known as Basel I, II, and III.[63]

According to Walter, Secretary General of BCBS,[64] the recent financial crisis was triggered primarily by excess liquidity which resulted in too much credit and weak underwriting standards, higher leverage, too little capital of sufficient quality, and inadequate liquidity buffers. The crisis was exacerbated by other factors including major shortcomings in risk management, corporate governance, market transparency, compensation practices, and the quality of supervision.[65] Basel III was designed to address these shortcomings and to ensure the soundness and stability of the financial system. Main issues addressed by Basel III include:[66] raising the quality and quantity of capital, with a much greater focus on common equity to absorb losses; improving risk coverage, especially related to capital markets activities (e.g., trading book exposures); the introduction of two liquidity ratios (short-term and long-term) and a leverage ratio; and stronger supervision, risk management and disclosure standards.

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[63] The G20 countries endorsed the Basel III capital and liquidity requirements at the November 2010 Summit held in Seoul, Korea.

[64] Speech by Stefan Walter, Secretary General, Basel Committee on Banking Supervision, at the 5th Biennial Conference on Risk Management and Supervision, Financial Stability Institute, Bank for International Settlements, Basel, 3-4 November 2010 (http://www.bis.org/speeches/sp101109a.htm).

[65] During the 90s, several regulatory changes became effective in the U.S. (Chen *et al.*, 2006). For example, banks are permitted to sell stocks through a subsidiary (10% of the total revenue in 1990, then 25% in 1996). In 1994, the Riegle-Neal Act permitted bank holding companies to operate in multiple states. The Gramm-Leach-Bliley Act in 1999 allows banks to expand into the securities and insurance businesses.

[66] Additional information about the Basel III standards can be found at: http://www.bis.org

In recent years, several facts highlight the increasing importance of the concept of social performance (SP) within the financial industry. First, major institutional investors from different countries have signed the Principles for Responsible Investment (PRI), launched in April 2006, which provide a voluntary framework to incorporate environmental, social and corporate governance (ESG) issues into their decision-making and ownership practices in order to better align their objectives with those of society at large.[67] Second, numerous financial firms have voluntarily adopted responsible environmental and social management practices pertaining to the financial industry, such as the Equator Principles, the Carbon Principles, and the Climate Principles. The Equator Principles (EPs) are a credit risk management framework for determining, assessing and managing environmental and social risk in project finance transactions where total capital costs exceed US$10 million.[68]

The Carbon Principles provide a framework for financial institutions to evaluate and address carbon risks in the financing of electric power projects in the US. Launched in 2007, these principles focus on a portfolio approach that includes efficiency, renewables and low carbon power sources to address climate change and carbon cost risks, while recognizing the need to provide reliable power at a reasonable cost to consumers.[69] Financial institution signatories of the international 2008 Climate Principles actively manage climate change across the full range of financial products and services, including research activities, asset management, retail banking, insurance and re-insurance, corporate banking, investment banking and markets, and project finance.[70]

A large majority of the studies related to SP focus on the link between SP and financial performance (FP), and report mixed results (Griffin and Mahon, 1997; Orlitzky and Benjamin, 2001; Margolis and Walsh, 2003; Orlitzky *et al.,* 2003; Mattingly and Berman, 2006; Baron *et al.,* 2011). A substantial number of these studies used samples composed of firms from multiple industries, including the financial industry (Griffin and Mahon, 1997;

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[67] http://www.unpri.org/principles/

[68] The Equator Principles (EPs) were launched on June 4, 2003. There are currently 72 adopting financial institutions from 27 countries covering over 70% of international project finance debt in emerging markets. Additional information can be found at: http://www.equator-principles.com

[69] http://www.carbonprinciples.org

[70] http://www.theclimategroup.org/programs/the-climate-principles/

Margolis and Walsh, 2003). Nonetheless, some studies examined a single industry arguing that the analysis of a single industry emphasizes internal validity rather than the external validity of multiple industry analysis (Griffin and Mahon, 1997; Simpson and Kohers, 2002). For example, Simpson and Kohers (2002) find a positive relationship between SP, which is measured using the Community Reinvestment Act ratings, and FP for a sample of commercial banks in the U.S. during 1993 and 1994.

Most of the previous studies report a negative relation between some measure of firm risk and SP for undifferentiated samples when financial firms are not excluded (e.g., Spicer, 1978; McGuire *et al.*, 1988; Feldman *et al.*, 1997; Orlitzky and Benjamin, 2001; Boutin-Dufresne and Savaria, 2004; Goss, 2007; Sharfman and Fernando, 2008; Salama *et al.*, 2011; Lee and Faff, 2009; Oikonomou *et al.*, 2012). Since financial firms are fundamentally different from other corporations (Diamond and Rajan, 2000; Jorion, 2003), they should be treated separately. The assets and activities of banks differ from those of industrial firms (Diamond and Rajan, 2000). Moreover, the indirect effects of failure are lower for industrial versus financial firms (Jorion, 2003).

Given that both regulators and investors are interested in identifying and understanding the effect of social performance on the risk of financial institutions and prior research that SP may affect firm value and performance (e.g., Starks, 2009), the objective of this paper is to examine the impact of social performance (SP) on the risk of financial institutions. The question is whether risk managers of financial firms should integrate SP into extra-financial risk evaluation? We estimate four market-based measures of risk: total, idiosyncratic, systematic and tail (VaR). We compute various measures of SP based on previous research (e.g., Waddock and Graves, 1997; Griffin and Mahon, 1997; Johnson and Greening, 1999; Hillman and Keim, 2001; Rehbein *et al.*, 2004; Mattingly and Berman, 2006; Harjoto and Jo, 2008; Sharfman and Fernando, 2008). We test the relationship between various risk and SP measures for a sample of 4132 financial firm-year observations covering the time period from 1991 to 2007.

Our results can be summarized as follows. First, the aggregate measure of SP (concerns) is significantly and negatively (positively) related to a financial firm's risk. The negative impact of SP on a financial firm's risk is mainly due to concerns, which suggests an asymmetric relation between SP and a financial firm's risk. Second, only the SP dimensions of Employee relations, Product and Corporate Governance significantly (negatively) affect a financial firm's risk. Third, Employee, Product and Corporate Governance concerns positively affect total risk, idiosyncratic risk, systematic risk, and the Value at Risk (VaR), whereas Product strengths positively affect the VaR. Finally, SP affects the risk of banks and trading firms, but not insurance firms.

The remainder of this paper is organized as follows. Section 2 presents the theoretical framework and research hypotheses. Section 3 describes the data and sample selection procedure. Section 4 describes the methodology used in order to test our hypotheses. Section 5 presents and discusses our empirical results. Section 6 concludes and provides avenues for future research.

3.2. Theoretical framework and research hypotheses

The finance and strategic management literatures provide theoretical arguments motivating the link between a firm's risk and social performance. The arguments involve the stakeholder theory, risk management, the Merton (1987) argument on investor recognition or the size of a firm's investor base, and investor preferences.

3.2.1. The stakeholder theory and risk management

The stakeholder theory is a central theoretical argument justifying the relationship between SP and firm value / performance (Freeman, 1984; Donaldson and Preston, 1995). The stakeholder theory suggests that SP may affect firm value / performance by affecting cash flows, their riskiness or both. This theory predicts that SP is inversely related with a firm's risk (McGuire *et al.*, 1988; Waddock and Graves, 1997) if, for example, SP is an indicator of management quality (McGuire *et al.*, 1988). Consistent with this prediction,

previous studies report that SP is negatively related to the cost of capital (Feldman *et al.*, 1997; Sharfman and Fernando, 2008; El Ghoul *et al.*, 2011), financial distress or the probability of default (Goss, 2007), the book-to-market ratio (Galema *et al.*, 2008), and the cost of private debt (Goss and Roberts, 2011).

Thus, the risk management of social and environmental issues potentially can reduce firm risk by reducing the probabilities of social or environmental crisis that could affect negatively firm's cash flows (Sharfman and Fernando, 2008) and/or by generating moral capital or goodwill which can provide insurance mechanisms to preserve financial performance (Godfrey, 2005; Godfrey et *al.,* 2009). Consistent with the risk management argument, a negative relationship is found between idiosyncratic risk and SP (Boutin-Dufresne and Savaria, 2004; Lee and Faff, 2009) and between systematic risk and SP (Oikonomou *et al.*, 2012). In addition, Godfrey *et al.* (2009) find that a measure of SP based on two dimensions (community and diversity) reduces the negative impact on shareholder returns (two-day cumulative abnormal returns) of negative legal actions against firms.

3.2.2. Merton (1987) argument on investor recognition and investor preferences

Merton (1987) develops an equilibrium model where investors with incomplete information about all stocks (e.g., expected returns, variances, and covariances) only include known stocks in their portfolios. This results in price differences induced by demand differences for different types of stocks so that the firm's risk decreases as the size of its investor base increases. If stocks with higher SP are stocks with more complete information from the investor's perspective due to their larger investor bases, then we would expect a negative relationship between SP and firm risk.

Other theoretical models examine the relationship between expected returns and SP (e.g., Heinkel *et al.,* 2001; Barnea *et al.,* 2005; Mackey *et al.,* 2007) by assuming differences in investor preferences based on SP. These models also predict that stocks with higher SP will have an excess demand and greater risk sharing, which leads to lower risk.

3.2.3. Research Hypotheses

Based on the aforementioned arguments, we present our first hypothesis stated in its alternative form:

H_1^A: The aggregate measure of social performance, which uses the difference between the scores for strengths and concerns, negatively affects a financial firm's risk.

The aggregate measures of SP may confound the differential effects of the individual dimensions of SP such as Diversity, Employee, and Product on firm risk (Galema *et al.*, 2008). Based on the arguments that social issues are different for different industries (Carroll, 1979; Griffin and Mahon, 1997), we expect that only some SP dimensions impact risk for financial firms. For example, banks do not face the same challenges of pollution, product safety, and employee safety encountered by other firms (Simpson and Kohers, 2002). Banks have limited direct pollution of the environment, a relatively homogeneous production process where product safety and employee safety are minimal concerns (Simpson and Kohers, 2002). However, social issues such as Corporate Governance seem a priori to be more important for financial firms. It is argued that the recent financial crisis was exacerbated by factors such as corporate governance and compensation practices.[71] These issues are mentioned explicitly in the Pillar 2 (Risk management and supervision) of Basel III. Thus, we may posit the following second hypothesis (stated in the alternative form):

H_2^A: Only some SP dimensions (e.g., Corporate Governance) significantly affect the financial firm's risk.

Previous research reports that concerns and strengths are distinct constructs (Waddock, 2003; Mattingly and Berman, 2006) because the latter are largely discretionary (Goss and Roberts, 2011). Since the aggregate (or individual dimension) measure of SP is simply the difference between strengths and concerns, which are positive by construction, the aggregate (or individual dimension) measure of strengths (concerns) is expected to be negatively

[71] Speech by Stefan Walter, Secretary General, Basel Committee on Banking Supervision, at the 5th Biennial Conference on Risk Management and Supervision, Financial Stability Institute, Bank for International Settlements, Basel, 3-4 November 2010 (http://www.bis.org/speeches/sp101109a.htm).

(positively) related to a financial firm's risk. This leads to our third and fourth hypotheses stated in their alternative forms:

H_3^A: The aggregate (individual dimension) measure of strengths affects negatively a financial firm's risk.

H_4^A: The aggregate (individual dimension) measure of concerns affects positively a financial firm's risk.

The empirical evidence suggests that the impact of concerns on firm risk is likely to be more important (e.g., Frooman, 1997; Mattingly and Berman, 2006; Godfrey *et al.,* 2009; Oikonomou *et al.*, 2012; Goss and Roberts, 2011). Lankoski (2009) finds that the economic impacts of SP are more positive for issues reducing negative externalities (e.g., avoiding or reducing concerns), than for issues generating positive externalities (e.g., undertaking or having strengths). Using the stakeholder theory framework, she argues that avoiding or reducing concerns seem to be the priority for stakeholders, whereas undertaking or having strengths come only secondary in stakeholder expectations. The above discussion leads to our fifth and final hypothesis stated in its alternative form:

H_5^A: The impact of concerns measures at the aggregate and individual level, respectively, on financial firm's risk is stronger than the impact of strengths measures at the aggregate and individual level, respectively.

3.3. Data and sample selection

To construct our sample we merge four databases based on the firms' CUSIP. MSCI ESG STATS (formerly KLD Research & Analytics, Inc) provides social performance data for U.S. firms, Thompson Reuters Institutional Brokers Earnings Services (I/B/E/S) provides analyst earnings forecasts data, CRSP provides information on stock returns, and COMPUSTAT provides accounting data.

The MSCI ESG STATS (henceforth KLD) database assesses firms by assigning binary ratings (1 or zero) to seven qualitative screens (both *Strength* ratings and *Concern* ratings) and six exclusionary screens (only *Concern* ratings). The qualitative screens are Community, Diversity, Employee relations, Environment, Product, Human Rights (formerly "*non-US operations*" before 2002), and Corporate Governance (formerly "*Other*" category before 2002). The exclusionary screens are Alcohol, Gambling, Firearms, Military, Nuclear power, and Tobacco.

Our sample defines financial firms as banks, insurance, real estate and trading firms. After retaining all firms in all four datasets and then removing non financial and utility firms, we obtain a final sample of 4132 firm-year observations for the period 1991-2007. The sample composition by Fama and French (1997) industry groups is as follow: 2040 firm-year observations for banking (49.37%), 950 for Insurance (23%), 40 for Real Estate (0.96%), and 1102 for Trading (26.67%). Given the relatively small sample size for Real Estate, we do not examine that subgroup by itself.

3.4. Methodology

3.4.1. Measures of social performance

We compute aggregate measures of SP concern and strength scores combined and separately. The separate measures are given by:

$$Str = \frac{1}{D}\sum_{d=1}^{D}\left[\frac{1}{N_{STR}}\sum_{i=1}^{I} Strength_i\right] \quad (1); \quad Con = \frac{1}{D}\sum_{d=1}^{D}\left[\frac{1}{N_{CON}}\sum_{j=1}^{J} Concern_j\right] \quad (2)$$

where, N_{STR} and N_{CON} are total maximum numbers of strengths and concerns, respectively, within a given KLD dimension for each year. These maximum numbers can vary over time as KLD adds or removes some strengths or concerns within a given dimension. D is the total number of KLD dimensions for a given year, and d refers to the KLD dimension. The combined aggregate measure is merely the difference between the

individual aggregate measures (Strength minus Concern). Exclusionary screens are not considered in our analysis because most of their values are zeros.[72]

In the second part of our analysis, we focus on individual dimensions of SP. For each KLD dimension, we compute similar measures which deal with strengths and concerns together and individually. To illustrate, the measure that combines strengths and concerns for dimension d is as follows:

$$AVE\_SP_d = \left[\frac{1}{N_{STR}} \sum_{i=1}^{I} Strength_i - \frac{1}{N_{CON}} \sum_{j=1}^{J} Concern_j \right]_d \quad (3)$$

AVE_SP_d is equal to the difference between the average strength and average concern scores for each firm-year observation; and N_{STR} and N_{CON} are as defined above. Human rights strengths are removed from our analysis because only 19 out of 3912 observations are different from zero. Appendix 3.1 presents a description of the strengths and concerns of the SP dimensions.

3.4.2. Measures of firm risk

Following standard practice in the literature, we compute a firm's total risk using two alternative measures. The first measure is the annualized standard deviation from the monthly stock returns over the previous five years, and the second measure is the annualized standard deviation from the daily stock returns over the past year. Systematic risk (i.e., market beta) is computed using the standard CAPM, and the four-factor Carhart (1997) model using monthly excess returns over the five previous years up to the measurement date (i.e., six months after the fiscal-year end date) for each firm-year observation. Idiosyncratic or unsystematic risk is computed as the standard deviation of the residuals from the standard CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997)

[72] Only 11, 1, 7, 2 and 24 observations are different from zero for Gambling, Firearms, Military, Nuclear power, and Tobacco dimensions, respectively. All firm-year observations for the Alcohol dimension are zeros.

model using daily excess returns over the previous year up to the measurement date for each firm-year observation.

The first two models are nested within the four-factor Carhart (1997) model which is given by the following equation:

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \beta_{iu}UMD_t + \varepsilon_{it} \qquad (4)$$

R_{it} is the return of firm i for month t. R_{ft} is the risk-free rate (1-month Treasury-bill rate). $(R_{Mt} - R_{ft})$ is the excess return on the market portfolio (CSRP value-weighted index) for month t. SMB_t and HML_t are the difference between the returns on portfolios of "small" and "big" capitalization stocks, and "high" and "low" book-to-market stocks, respectively, for month t. UMD_t is the difference between the returns on portfolios of high and low prior return stocks. ε_{it} is the stochastic error term, assumed to be IID normal with mean zero and constant variance $\sigma^2_{\varepsilon_i}$. The standard CAPM only includes the market factor, and the three-factor Fama and French (1993) model all but the UMD_t factor. The three models are estimated using data for the factors obtained from Kenneth French's web site.[73]

Up to this point, we considered traditional risk measures (i.e., stock return volatility and its systematic and idiosyncratic components) which are functions of both upside and downside variations from the expected or mean return (i.e., downside losses and upside gains). From an investor perspective, these risk measures can be justified if the distribution of returns is well-behaved (e.g., the normal distribution) as is the case in the mean-variance framework of traditional portfolio theory (Markowitz, 1952). If this is not the case, for example, if the distribution of returns is asymmetric with fat tails, then these risk measures may not provide an accurate characterization of the desirability of an investment. Moreover, previous research has shown that investors care differently about downside losses versus upside gains (see e.g., Ang, Chen and Xing, 2006). Ang *et al.* (2006) show that the cross-section of stock returns reflects a premium for bearing downside risk as measured by

[73] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

downside beta. Thus, we extend our analysis by examining the impact of SP on downside risk as measured by the Value at Risk (VaR).

3.4.2.1. Value at Risk (VaR)[74]

VaR is a statistical measure of downside risk. VaR is the expected loss of a portfolio or security over a specified time period for a set level of probability (Jorion, 2003; Choudhry, 2006).[75] We follow the Basel Committee recommendations which require VaR to be computed with a 99% confidence interval for a one-day horizon and a minimum historical observation period of one year (Jorion, 2003).[76] For each firm-year in our sample, we calculate the 1-day 1% VaR on each day using four methods: Historical simulation (HS), RiskMetrics (RM), the GARCH (1,1) - t(d) model, and Filtered historical simulation (FHS). Hereafter, we briefly discuss these methods. Appendix 3.2 provides details on the implementation of the four methods.

The historical simulation (HS) method is model-free since it does not rely on any particular parametric model for variance and a normal distribution for returns. HS assumes that the distribution of tomorrow's returns is well approximated by the empirical distribution of the past m observations without imposing any further assumptions. However, the serious drawback of the HS method is the ad hoc choice of m, which has an impact on the magnitude and dynamics of VaR. In this study, we use a 504-day moving sample size (i.e. m = 504) which corresponds to approximately two years of past daily returns.

The RiskMetrics (RM) method assumes normal distributions for standardized returns coupled with a conditional variance model where weights on past returns decline exponentially as we move backward in time.[77] The RM variance model, also called the exponential smoothing variance model, tracks variance changes in a way consistent with

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[74] This section draws heavily from Christoffersen (2003).
[75] To learn more about the VaR measure, readers can refer to Jorion (2003), Christoffersen (2003) and Choudhry (2006).
[76] VaR is used to calculate capital requirements through the 1996 Market Risk Amendment to the Basle Accord (Berkowitz and O'Brien, 2002).
[77] Time-varying variance models help explain the non-normal features of asset returns.

observed returns. However, the RM variance model has certain drawbacks, such as it does not allow for the leverage effect,[78] which is indeed a stylized fact in asset returns. Also, it ignores the empirical observation that the long-run average variance tends to be relatively stable over time.

These shortcomings motivate the use of more elaborate models such as the generalized autoregressive conditional heteroskedasticity (GARCH) models. The GARCH model corrects for the shortcomings of the RM variance model and can capture important features of returns due to its flexibility. A key advantage of the GARCH model for risk management is that the 1-day forecast of variance is given directly by the model. The GARCH (1,1) - t(d) model considered in this study assumes that the standardized returns follow the standardized $t(d)$ distribution which has only one parameter, d. The standardized $t(d)$ distribution fits the return data better because it allows for fatter tails than the normal distribution. Moreover, the GARCH (1,1) - t(d) model used here takes into account the leverage effect discussed above. The downside of the GARCH model is that it requires nonlinear parameter estimation.

Finally, the filtered historical simulation (FHS) method combines a conditional variance model with a historical simulation method for the standardized returns. We use GARCH (1,1) - t(d) model as the conditional variance model for the FHS method.

We implement these four models as in Christoffersen (2003). For each firm, we first calculate the 1-day 1% VaR for each year using the four methods. We denote the resulting 1-day 1% VaR as dvarhsw, dvarrmw, dvargarchw, and dvarfhsw, respectively. We then compute for each firm-year estimates of the annualized 1% VaR by multiplying the average 1-day 1% VaR by $\sqrt{252}$. We denote the resulting annualized 1% VaR as avarhsw, avarrmw, avargarchw, and avarfhsw, respectively.

[78] The leverage effect refers to the negative correlation between variances and returns, which is a stylized fact generally observed in asset returns. A negative return increases variance by more than a positive return of the same magnitude.

3.4.3. Impact of Social Performance on a Financial Firm's Risk

3.4.3.1. Multivariate framework

In the first part of our analysis, we examine the effect on a financial firm's risk of the aggregate measure of social performance (SP) which combines strengths and concerns using the following regression:

$$Risk_{it} = \alpha_0 + \alpha_1 SP_{it-1} + \delta X_{it-1} + \varepsilon_{it} \qquad (5)$$

where $Risk_{it}$ and SP_{it} are the risk and the social performance measure for firm i at time t, respectively. X_{it} is a vector of firm-specific characteristics as well as the industry and year dummies. δ is the vector of the associated regression coefficients. Next we examine the effect on the firm's risk of the two aggregate measures of strengths (*Str*) and Concerns (*Con*) separately using the following regression:

$$Risk_{it} = \alpha_0 + \alpha_{11} Str_{it-1} + \alpha_{12} Con_{it-1} + \delta X_{it-1} + \varepsilon_{it} \qquad (6)$$

In the second part of our analysis, we examine the effect on a financial firm's risk of the dimensions of social performance using the following regression:

$$Risk_{it} = \lambda_0 + \sum_{d=1}^{D} \beta_d AVE\_SP_{idt-1} + \delta X_{it-1} + \varepsilon_{it} \qquad (7)$$

where AVE_SP_{idt} is the social performance measure for firm i relative to dimension d at time t, and all other variables are as defined above. Then, we examine the effect on a financial firm's risk of the strengths and concerns of SP dimensions separately using the following regression:

$$Risk_{it} = \lambda_0 + \sum_{d=1}^{D} \beta_{sd} AVE\_STR_{idt-1} + \sum_{d=1}^{D} \beta_{cd} AVE\_CON_{idt-1} + \delta X_{it-1} + \varepsilon_{it} \quad (8)$$

where AVE_STR_{idt} and AVE_CON_{idt} are the strengths and concerns scores, respectively, for firm i relative to dimension d at time t.

We estimate our regressions using pooled cross-section time-series regressions and controlling for industry and year fixed effects. The industry dummy variables control for the cross-sectional heterogeneity in the risk measures across the four sub-industries (banking, insurance, real estate, and trading). The year dummy variables control for the market-wide effects (i.e., the prevailing macroeconomic conditions) on the firm's risk. Standard errors are adjusted for both heteroskedasticity and clustering of observations.

3.4.3.2. Control Variables

In our multivariate analysis we include control variables that prior research finds has an effect on firm risk.[79]

- **Size** (-): Firm size (lnmkteq) is measured as the natural logarithm of the market value of common equity at the most recent fiscal year end prior to the measurement date of the risk measures. We expect firm size to be negatively related to a firm's risk.

- **Book-to-Market (B/M) ratio** (+):[80] B/M ratio (bmw) is measured as the ratio of the book to market value of common equity as of the most recent fiscal year end. We expect the book-to-market ratio to be positively related to a firm's risk.

- **Net leverage** (+): Net leverage (netlevw) is measured as the ratio of long-term debt minus cash & marketable securities to the market value of common equity (Bates *et al.*,

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[79] See, for example, Fama and French (1992, 1993), Brennan *et al.* (1998), Berk *et al.* (1999), Gebhardt *et al.* (2001), Chordia *et al.* (2001), Gode and Mohanram (2003), Carlson *et al.* (2004, 2006), Botosan and Plumlee (2005), and Lee *et al.* (2009).

[80] B/M has been used as proxy for risk, growth opportunities, market mispricing or accounting conservatism (Gode and Mohanram, 2003; Goss and Roberts, 2011).

2009) where all components are measured at the most recent fiscal year end. We expect net leverage to be positively related to a firm's risk (Botosan and Plumlee, 2005; Lee *et al.,* 2009).

- **Expected return (+)**: Expected return (ret1y), which is proxied by the annualized return from the previous year's daily stock returns, is expected to be positively related to a firm's risk (Gordon and Gordon, 1997; Malkiel and Xu, 1997; Gode and Mohanram, 2003; Botosan and Plumlee, 2005; Hail and Leuz, 2006; Lee *et al.,* 2009; Lee and Faff, 2009).

- **Stock liquidity** (-): The level of liquidity (avgturnover), which is measured as the average daily share turnover, and the liquidity risk (cvturnover), which is measured as the coefficient of variation of this measure over the previous year, are both expected to be negatively related to the firm's risk (Brennan *et al.,* 1998; Chordia *et al.,* 2001). Share turnover is defined as daily shares traded divided by daily shares outstanding.

- **Cash flow risk** (+): We expect the dispersion of analyst forecasts and the standard deviation of return on assets (ROA), which are used to proxy for cash flow variability, to be positively related to the firm's risk. Dispersion of analyst forecasts (dispeps1w) is measured as the cross-sectional standard deviation of one-year-ahead earnings forecasts. The standard deviation of return on assets (sdroa5yw) is computed over the previous five years up to the fiscal-year end date.

- **Investment** (-): We expect investment, which is measured as the sum of Capital expenditures, R&D expenditures, and Advertising expenses, divided by total assets, to be negatively related to the firm's risk based on previous research (Berk *et al.,* 1999; Carlson *et al.,* 2004, 2006; Liu *et al.,* 2007).

- **Expected growth in earnings** (+): We expect the firm's expected long-term growth in earnings (expgrthw), which is measured as the mean annualized five-year earnings growth rate from I/B/E/S, to be positively related to the firm's risk. If the long-term rate is missing, we estimate it as the implicit growth in forecasted earnings from year 1 to year 2.

- **Default risk** (+): We expect Altman's (1993) Zscore, which is a measure of distress risk, to be negatively related to the firm's risk. A higher value of the Zscore indicates a lower likelihood of default.

- **Investor base** (-): We expect the investor base (inv_basew), which is measured as the number of common ordinary shareholders divided by common shares outstanding, to be negatively related to the firm's risk.

3.5. Empirical results

3.5.1. Descriptive statistics[81]

Table 3.1 reports descriptive statistics for the social performance (SP) measures (Panel A and B). The mean (median) value of the aggregate SP measure that combines strengths and concerns is zero. The mean and median aggregate measure of strengths (Str) of 0.0363 and 0.0238, respectively, are significantly smaller than the mean and median aggregate measure of concerns (Con) of 0.0458 and 0.0357, respectively, based on t- and z- values of -11.02 and -11.64, respectively.[82] Panel B of Table 3.1 shows that the mean values of the individual SP measures are negative, except for Community (0.0241) and Environment (0.0004). However, the median values of the individual SP measures are all zero. Except for Community and Environment dimensions, the average concern scores exceed their average strength scores for all dimensions.

[81] To ensure that our results are not driven by outliers we winsorize all variables, except the social performance measures and dummy variables, at the 1st and 99th percentiles.
[82] We use the paired t-test (the wilcoxon signed rank test) for the comparison of the means (medians).

Table 3.1: Descriptive statistics of the social performance measures during 1991-2007

	Mean	Median	sd	Min	Max	Skewness	Kurtosis	N
Panel A: Aggregate SP measures								
SP	-0.0099	0	0.0548	-0.2666	0.1880	-0.0785	3.8039	4132
Str	0.0363	0.0238	0.0436	0	0.3277	1.8983	7.8563	4132
Con	0.0458	0.0357	0.0495	0	0.3428	1.6788	7.1823	4132
Panel B: Individual SP measures								
ave_com	0.0241	0	0.1594	-0.6666	1	0.7595	6.6972	4132
ave_div	-0.0228	0	0.2197	-0.6666	0.75	-0.0174	2.8634	4132
ave_emp	-0.0050	0	0.1175	-0.6	0.5	-0.0829	4.6144	4132
ave_env	0.0004	0	0.0238	-0.4285	0.3333	0.7397	86.613	4132
ave_non	-0.0055	0	0.0554	-0.5	0.5	-4.2750	52.088	4132
ave_pro	-0.0505	0	0.1527	-0.75	0.5	-2.0418	8.4619	4132
ave_oth	-0.0101	0	0.1775	-0.5	0.3333	0.1063	3.1520	4132
avestr_com	0.0634	0	0.1326	0	1	2.4994	9.7326	4132
avecon_com	0.0393	0	0.1028	0	0.6666	2.4366	7.8627	4132
avestr_div	0.0800	0	0.1317	0	0.75	1.9893	7.1222	4132
avecon_div	0.1028	0	0.1580	0	0.6666	0.9869	2.3740	4132
avestr_emp	0.0358	0	0.0792	0	0.5	2.2006	7.5183	4132
avecon_emp	0.0408	0	0.0869	0	0.6	1.9690	6.2767	4132
avestr_env	0.0020	0	0.0210	0	0.6	13.248	241.2191	4132
avecon_env	0.0016	0	0.0197	0	0.5714	16.840	358.9668	4132
avecon_non	0.0072	0	0.0497	0	0.5	7.6314	65.3217	4132
avestr_pro	0.0134	0	0.0566	0	0.5	4.0207	17.5274	4132
avecon_pro	0.0639	0	0.1503	0	0.75	2.5529	9.3231	4132
avestr_oth	0.0550	0	0.1127	0	0.3333	1.7374	4.3555	4132
avecon_oth	0.0651	0	0.1141	0	0.5	1.5986	4.8559	4132

Table 3.1 (Continued): Descriptive statistics of the risk measures and the explanatory variables during 1991-2007

	Mean	Median	sd	Min	Max	Skewness	Kurtosis	N
Panel C: Risk measures								
mbetaw	0.7683	0.6221	0.6186	-0.2037	2.9884	1.1015	4.2796	4056
mbetaffw	0.8648	0.7815	0.6203	-0.4239	2.6561	0.5238	2.9905	4056
Volatilityw	0.2939	0.2618	0.1259	0.1373	0.8646	1.9491	8.0895	4056
dvolatilityw	0.2994	0.2703	0.1223	0.1376	0.8174	1.5922	6.4161	4132
sdresCAPMw	0.2595	0.2302	0.1160	0.1225	0.8954	2.1726	10.0758	4132
sdresffw	0.2505	0.2225	0.1118	0.1186	0.8770	2.2816	10.7888	4132
sdres4ffw	0.2476	0.2191	0.1106	0.1175	0.8665	2.2797	10.7409	4132
dvarhsw	0.0473	0.0433	0.0177	0.0219	0.1158	1.4375	5.5853	3900
avarhsw	0.7522	0.6882	0.2819	0.3482	1.8397	1.4375	5.5853	3900
dvarmw	0.0446	0.0404	0.0185	0.0206	0.1226	1.6164	6.4776	3900
avarmw	0.7084	0.6413	0.2942	0.3276	1.9471	1.6164	6.4776	3900
dvargarchw	0.0515	0.0467	0.0212	0.0250	0.1452	1.8642	7.7030	3862
avargarchw	0.8175	0.7414	0.3378	0.3978	2.3060	1.8642	7.7030	3862
dvarfhsw	0.0465	0.0423	0.0178	0.0208	0.1129	1.3569	5.1258	3848
avarfhsw	0.7385	0.6730	0.2839	0.3316	1.7935	1.3569	5.1258	3848
Panel D: Independent variables								
dispeps1w	0.1054	0.05	0.1674	0	1.22	4.3915	26.1865	3614
expgrthw	0.1193	0.105	0.0850	0	0.6774	3.8567	24.081	4111
ret1y	0.1208	0.1432	0.2907	-2.0877	1.8380	-0.828	7.8221	4132
avgturnover	0.0054	0.0040	0.0053	0.0001	0.1082	5.2958	58.5696	4132
sdturnover	0.0046	0.0029	0.0069	0.0001	0.2829	18.0713	632.2373	4132
cvturnover	0.8566	0.7061	0.5051	0.2734	6.193	3.0356	17.2777	4132
illiq ($*10^{-7}$)	0.14	0.0179	0.721	0.0000	34.6	31.0286	1334.966	4132
lnmkteq	7.6004	7.4795	1.5264	-3.1700	12.519	0.3377	3.2411	4127
bmw	0.5585	0.5153	0.2843	0.0542	1.6495	1.1983	5.3371	4120
rd	0.0066	0	0.0288	0	0.2238	5.3109	32.6639	730
ad	0.0036	0.0008	0.0167	0	0.2783	10.7626	138.0205	1731
capxs	0.0063	0.0015	0.0172	-0.0008	0.3395	8.5160	111.8933	3292
investment	0.0077	0.0012	0.0249	-0.0000	0.3395	6.7714	58.9943	4128
zscorew	1.5265	0.5424	4.1063	-8.5574	74.864	9.0580	114.9431	4132
netleww	0.2164	0.1434	0.2655	-0.8111	1.2329	0.6808	3.8346	4128
sdroa5yw	0.0174	0.0067	0.0365	0.0011	0.4073	6.0445	51.4512	3856
inv_basew	0.1874	0.0701	0.3226	0.0003	2.0228	3.4256	16.8299	2963

Notes:

Table 3.1 presents the descriptive statistics of the social performance measures (panels A and B), the risk measures (Panel C), and the explanatory variables (Panel D) for the 4132 firm-year observations covering the time period from 1991 to 2007.

SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). Community relations (ave_com), Diversity (ave_div), Employee relations (ave_emp), Environmental performance (ave_env), Human Rights (ave_non), Product (ave_pro), and Corporate Governance (ave_oth) are the difference between the average strength and average concern for each SP dimension, respectively. Community strengths (avestr_com), Community concerns (avecon_com), Diversity strengths (avestr_div), Diversity concerns (avecon_div), Employee strengths (avestr_emp), Employee concerns (avecon_emp), Environment strengths (avestr_env), Environment concerns (avecon_env), Human Rights concerns (avecon_non), Product strengths (avestr_pro), Product concerns (avecon_pro), Corporate Governance strengths (avestr_oth), and Corporate Governance concerns (avecon_oth) are separate average strength and concern scores for each SP dimension, respectively.

Systematic risk (mbetaw and mbetaffw) are the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively. The annualized (daily average) 1% VaR (Value at Risk) denoted as avarhsw, avarrmw, avargarchw, and avarfhsw (dvarhsw, dvarrmw, dvargarchw, and dvarfhsw) are estimated using historical simulation (HS), RiskMetrics (RM), the GARCH (1,1) - t(d) model, and filtered historical simulation (FHS), respectively.

Dispersion of analyst forecasts is measured by the cross-sectional standard deviation of one-year-ahead earnings forecasts (dispeps1w). Expected growth in earnings (expgrthw) is the mean annualized five-year earnings growth rate from I/B/E/S (where available, otherwise estimated as the implicit growth in forecasted earnings from year 1 to year 2). ret1y is the annualized return from the previous year's daily stock returns. The level of liquidity is measured as the average daily share turnover (avgturnover), and the liquidity risk is measured as the standard deviation (sdturnover) or the coefficient of variation (cvturnover) of this measure over the previous year. Share turnover is defined as daily shares traded divided by daily shares outstanding. The Amihud illiquidity measure (illiq) is computed as in Amihud (2002). Firm size (lnmkteq) is measured as the logarithm of the market value of common equity at the most recent fiscal year-end. Book-to-market ratio (bmw) is measured as the ratio of the book to market value of common equity as of the most recent fiscal year end. Capxs is capital expenditures divided by total assets, rd is R&D expenditures divided by total assets, and ad is advertising expenses divided by total assets. Investment is computed as the sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets. Net leverage (netlevw) is measured as the ratio of long-term debt minus cash & marketable securities to the market value of common equity using values for the most recent fiscal year end. The standard deviation of return on assets (sdroa5yw) is measured over the five previous years up to the fiscal-year end date of each firm-year observation. The variable investor base (inv_basew) is computed as the number of common ordinary shareholders divided by common shares outstanding. Altman's (1993) distress risk measure (zscorew) is computed as:

$$Zscore = 1.2 \times \left(\frac{NWC}{TA}\right) + 1.4 \times \left(\frac{RE}{TA}\right) + 3.3 \times \left(\frac{EBIT}{TA}\right) + \left(\frac{\text{Rev}}{TA}\right) + 0.6 \times \left(\frac{MVEquity}{BVTL}\right)$$

where, NWC is net working capital (current assets – current liabilities), RE is retained earnings, EBIT is earnings before interest and taxes, Rev is the total revenues, MVEquity is the market value of total equity (common and preferred stocks), BVTL is total liabilities (current and long term liabilities), and TA is total assets. Except for the social performance measures and dummy variables, the variables are winsorized (w) at the 1st and 99th percentiles.

Panel C of Table 3.1 also reports descriptive statistics for the risk measures. The mean (median) annualized total risk is 0.29 (0.26) using five-year monthly returns and 0.29 (0.27) using one-year daily returns. The mean (median) systematic risk is 0.76 (0.62) using the CAPM and 0.86 (0.78) using the Fama-French three-factor model. The mean (median) idiosyncratic risk is 0.25 (0.23) using the CAPM, 0.25 (0.22) using the three factor model, and 0.24 (0.21) using the four-factor model. The mean (median) annualized Value at Risk (VaR) is 0.75 (0.68) using historical simulation model, 0.70 (0.64) using the Risk Metric model, 0.81 (0.74) using the GARCH model, and 0.73 (0.67) using filtered historical simulations, respectively. Panel D of Table 3.1 reports descriptive statistics for our explanatory variables.

Table 3.2 reports that the aggregate measure of social performance (SP) has a positive and negative correlation with the strengths score (Str) and concerns scores (Con), respectively. The correlation of 0.3 between strengths and concerns is relatively low. Table 3.2 also reports that the correlation coefficients among the risk measures are positive as expected.

Table 3.2: Correlation coefficients between the risk measures and the aggregate measures of social performance during 1991-2007

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
SP	(1)	1.0000													
Str	(2)	0.5114*	1.0000												
Con	(3)	-0.6652*	0.3001*	1.0000											
mbetaw	(4)	-0.0758*	0.1115*	0.1723*	1.0000										
mbetaffw	(5)	-0.0318	0.1991*	0.2008*	0.7725*	1.0000									
Volatilityw	(6)	-0.0813*	0.0034	0.0895*	0.4758*	0.4256*	1.0000								
dvolatilityw	(7)	-0.0403	0.0028	0.0471	0.4369*	0.2979*	0.5076*	1.0000							
sdresCAPMw	(8)	-0.0288	-0.0280	0.0061	0.3964*	0.2556*	0.5206*	0.9619*	1.0000						
sdresffw	(9)	-0.0356	-0.0291	0.0123	0.3956*	0.2632*	0.5462*	0.9506*	0.9956*	1.0000					
sdres4ffw	(10)	-0.0365	-0.0317	0.0109	0.3959*	0.2661*	0.5547*	0.9444*	0.9925*	0.9988*	1.0000				
avarhsw	(11)	-0.0408	0.0084	0.0491	0.3129*	0.3314*	0.7986*	0.6020*	0.6029*	0.6217*	0.6303*	1.0000			
avarrmw	(12)	-0.0568	0.0189	0.0782*	0.2795*	0.2832*	0.8137*	0.3982*	0.3807*	0.4037*	0.4132*	0.8081*	1.0000		
avargarchw	(13)	-0.0619	-0.0168	0.0534	0.2668*	0.2414*	0.7860*	0.4167*	0.4058*	0.4267*	0.4356*	0.7824*	0.9434*	1.0000	
avarfhsw	(14)	-0.0365	0.0016	0.0399	0.3862*	0.3262*	0.6297*	0.8529*	0.8286*	0.8283*	0.8288*	0.8043*	0.5400*	0.5475*	1.0000

Note:

Table 3.2 presents the correlation coefficients between the risk and social performance measures for the 4132 firm-year observations covering the time period from 1991 to 2007. SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). Systematic risk (mbetaw and mbetaffw) are the market beta derived from the CAPM or the four-factor Carhart (1997) model, respectively. Idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw) is the standard deviation of the residuals derived from the CAPM, the three-factor Fama and French (1993) model and the four-factor Carhart (1997) model, respectively. Total risk (Volatilityw and dvolatilityw) is the annualized standard deviation from the monthly stock returns over the previous five years and from the daily stock returns over the past year, respectively. The annualized 1% VaR (Value at Risk) denoted as avarhsw, avarrmw, avargarchw, and avarfhsw are estimated using historical simulation (HS), RiskMetrics (RM), the GARCH (1,1) - t(d) model, and filtered historical simulation (FHS), respectively.

* Statistical significance at the 1% level ($p < 0.01$).

Based on Table 3.2, the aggregate measure of social performance (SP) which combines strengths and concerns is correlated negatively and significantly with the systematic risk computed from the CAPM, and the volatility computed using five-year monthly returns. The aggregate measure of strengths (Str) is correlated positively and significantly with the systematic risk measures. The aggregate measure of concerns (Con) is correlated positively and significantly with the systematic risk measures, the volatility computed using five-year monthly returns, and the VaR measure computed using the Risk Metric model.

Based on Table 3.3, the correlation coefficients between some explanatory variables are relatively high. While the correlation coefficient between the average and the standard deviation of share turnover is 0.83, the correlation coefficient between the average and the coefficient of variation of share turnover is insignificant. Thus, we use these two latter variables in our regression analyses. Also, we use only the investment variable in our regression analyses since the correlations between investment and the three variables (R&D, advertising, and capital expenditures) are high. Except for these special cases, all correlation coefficients are relatively low suggesting that multicollinearity should not be a concern in our study. Finally, Table 3.4 reports the correlation coefficients between the SP dimensions (measures which combine strengths and concerns within the same dimension) as well as between the strengths and concerns of SP dimensions. Although significant in many cases, the correlation coefficients are relatively low.

Table 3.3: Correlation coefficients between the aggregate measures of social performance and the explanatory variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
SP	(1)	1.0000																			
Str	(2)	0.5114*	1.0000																		
Con	(3)	-0.6652*	0.3001*	1.0000																	
dispeps1w	(4)	-0.0638	0.0755*	0.1327*	1.0000																
expgrthw	(5)	-0.0348	-0.0191	0.0224	-0.0634	1.0000															
ret1y	(6)	0.0278	0.0395	0.0007	-0.2330*	0.0399	1.0000														
avgturnover	(7)	-0.1406*	-0.0832*	0.0856*	0.3967*	0.0778*	-0.2139*	1.0000													
sdturnover	(8)	-0.0753*	-0.0910*	0.0055	0.3082*	0.0652*	-0.1663*	0.8305*	1.0000												
cvturnover	(9)	0.0338	-0.1316*	-0.1533*	-0.0046	0.0610	0.0183	-0.0091	0.2960*	1.0000											
illiq	(10)	0.0610	-0.0050	-0.0745*	-0.0563	0.0197	0.0421	-0.1136*	-0.0370	0.3483*	1.0000										
lnmkteq	(11)	-0.0562	0.4049*	0.4144*	0.1021*	-0.0304	0.1294*	0.0261	-0.0871*	-0.3926*	-0.2455*	1.0000									
bmw	(12)	-0.0218	-0.0065	0.0124	0.2408*	-0.1108*	-0.2849*	0.0780*	0.0738*	0.0385	0.0070	-0.2087*	1.0000								
rd	(13)	-0.0151	0.0838	0.0677	-0.1354	0.1185	-0.0042	0.2123*	0.1751*	0.0229	0.0670	-0.0904	-0.2394*	1.0000							
ad	(14)	-0.0684	-0.0807	0.0029	-0.0303	0.0844	0.0594	0.0733	0.0342	-0.0085	0.0953	0.0168	-0.1516*	0.0394	1.0000						
capxs	(15)	-0.0326	-0.0617	-0.0182	-0.0393	0.0479	0.0070	0.0986*	0.0831*	0.0575	-0.0040	-0.0295	-0.1424*	0.4780*	0.2278*	1.0000					
investment	(16)	-0.0614	-0.0864*	-0.0075	-0.0487	0.0981*	-0.0019	0.1481*	0.1164*	0.0326	0.0327	-0.0568	-0.1754*	0.8060*	0.7976*	0.7427*	1.0000				
zscorew	(17)	-0.0696*	-0.0996*	-0.0088	-0.0369	0.1371*	0.0812*	0.1947*	0.1288*	0.0097	-0.0097	-0.0327	-0.2201*	0.3386*	0.3712*	0.2795*	0.3864*	1.0000			
netlevw	(18)	-0.0165	0.0135	0.0303	0.1539*	-0.0309	-0.0435	0.1176*	0.0797*	-0.0602	-0.0702*	0.0625	0.0148	-0.5404*	0.0553	-0.1413*	-0.1554*	-0.2685*	1.0000		
sdroa5yw	(19)	-0.1110*	-0.1066*	0.0300	0.0661	0.1775*	-0.0013	0.2785*	0.2087*	0.0511	-0.0021	-0.0928*	-0.1259*	0.4697*	0.3382*	0.1911*	0.3208*	0.3984*	-0.1907*	1.0000	
inv_basew	(20)	0.0865*	0.0307	-0.0689	0.0609	-0.0600	0.0223	0.0038	-0.0091	-0.0278	-0.0204	-0.0329	0.1751*	-0.0596	-0.0495	-0.0612	-0.0697	-0.0470	-0.0128	-0.0632	1.0000

Note:

Table 3.3 presents the correlation coefficients between the social performance measures and the explanatory variables for the 4132 firm-year observations covering the time period from 1991 to 2007. SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). The explanatory variables are: dispersion of analyst forecasts (dispeps1w), expected growth in earnings (expgrthw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (sdturnover or cvturnover), the Amihud (2002) illiquidity measure (illiq), firm size (lnmkteq), the book-to-market ratio (bmw), capital expenditures (capxs), R&D expenditures (rd), advertising expenses (ad), Investment, net leverage (netlevw), the standard deviation of return on assets (sdroa5yw), investor base (inv_basew), and Altman's (1993) distress risk measure (zscorew). All variables are defined in footnotes of Table 3.1.

* Statistical significance at the 1% level ($p < 0.01$).

Table 3.4: Correlation coefficients between the measures of social performance dimensions

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
ave_com	(1)	1.0000																			
ave_div	(2)	0.2192*	1.0000																		
ave_emp	(3)	0.1167*	0.1586*	1.0000																	
ave_env	(4)	0.0995*	0.0811*	0.0707*	1.0000																
ave_non	(5)	-0.0907*	-0.0392	-0.0389	-0.0324	1.0000															
ave_pro	(6)	-0.1290*	-0.1367*	0.0579	-0.0124	0.1646*	1.0000														
ave_oth	(7)	-0.1975*	-0.2279*	-0.0940*	-0.0327	0.1020*	0.2975*	1.0000													
avestr_com	(8)	0.7672*	0.3396*	0.1623*	0.1128*	-0.1501*	-0.2041*	-0.2494*	1.0000												
avecon_com	(9)	-0.5611*	0.0982*	0.0285	-0.0088	-0.0530	-0.0632	-0.0156	0.1004*	1.0000											
avestr_div	(10)	0.3127*	0.7023*	0.1317*	0.0950*	-0.0764*	-0.3122*	-0.3520*	0.4687*	0.1199*	1.0000										
avecon_div	(11)	-0.0442	-0.8050*	-0.1107*	-0.0336	-0.0092	-0.0701*	0.0236	-0.0815*	-0.0366	-0.1430*	1.0000									
avestr_emp	(12)	0.1610*	0.2133*	0.6731*	0.0682*	-0.0550	-0.0748*	-0.2191*	0.2606*	0.0865*	0.3055*	-0.0420	1.0000								
avecon_emp	(13)	-0.0110	-0.0201	-0.7391*	-0.0335	0.0025	-0.1465*	-0.0724*	0.0180	0.0403	0.1002*	0.1115*	0.0006	1.0000							
avestr_env	(14)	0.1056*	0.1181*	0.0816*	0.6194*	-0.1240*	-0.1021*	-0.0960*	0.1709*	0.0566	0.1704*	-0.0221	0.1367*	0.0142	1.0000						
avecon_env	(15)	-0.0077	0.0277	0.0015	-0.5484*	-0.0928*	-0.0938*	-0.0627	0.0457	0.0709*	0.0667*	0.0170	0.0632	0.0556	0.3168*	1.0000					
avecon_non	(16)	0.1227*	0.1067*	0.0659*	0.0356	-0.9015*	-0.2019*	-0.1424*	0.2173*	0.0901*	0.1793*	0.0011	0.0985*	0.0006	0.1350*	0.1008*	1.0000				
avestr_pro	(17)	0.1699*	0.1655*	0.1216*	0.0731*	-0.0734*	0.2271*	-0.0973*	0.2212*	0.0219	0.2451*	-0.0259	0.1984*	0.0163	0.0937*	0.0115	0.1170*	1.0000			
avecon_pro	(18)	0.1951*	0.2012*	-0.0130	0.0401	-0.1948*	-0.9303*	-0.3389*	0.2906*	0.0725*	0.4094*	0.0615	0.1508*	0.1549*	0.1391*	0.0997*	0.2492*	0.1460*	1.0000		
avestr_oth	(19)	-0.1232*	-0.1300*	-0.0609	-0.0043	0.0386	0.1146*	0.7797*	-0.1200*	0.0363	-0.1365*	0.0670*	-0.0884*	0.0018	-0.0193	-0.0154	-0.0564	-0.0147	-0.1219*	1.0000	
avecon_oth	(20)	0.1855*	0.2263*	0.0861*	0.0467	-0.1207*	-0.3497*	-0.7856*	0.2695*	0.0601	0.4129*	0.0295	0.2535*	0.1144*	0.1303*	0.0824*	0.1659*	0.1368*	0.4068*	-0.2251*	1.0000

Note:

Table 3.4 presents the correlation coefficients between the measures of social performance dimensions for the 4132 firm-year observations covering the time period from 1991 to 2007. Community relations (ave_com), Diversity (ave_div), Employee relations (ave_emp), Environmental performance (ave_env), Human Rights (ave_non), Product (ave_pro), and Corporate Governance (ave_oth) are the difference between the average strength and average concern for each SP dimension, respectively. Community strengths (avestr_com), Community concerns (avecon_com), Diversity strengths (avestr_div), Diversity concerns (avecon_div), Employee strengths (avestr_emp), Employee concerns (avecon_emp), Environment strengths (avestr_env), Environment concerns (avecon_env), Human Rights concerns (avecon_non), Product strengths (avestr_pro), Product concerns (avecon_pro), Corporate Governance strengths (avestr_oth), and Corporate Governance concerns (avecon_oth) are separate average strength and concern scores for each SP dimension, respectively.

* Statistical significance at the 1% level ($p < 0.01$).

3.5.2. Impact of Social Performance on a Financial Firm's Risk

3.5.2.1. Impact of social performance on total risk

Panel A of Table 3.5 reports the results of the regressions between total risk and the aggregate measures of social performance. The aggregate measure of social performance (SP), which combines strengths and concerns, is significantly and negatively related to stock return volatility. The coefficient associated with the aggregate measure of concerns (Con) is positive and statistically significant regardless of the total risk metric used. The coefficients associated with the aggregate strengths measure (Str) are also positive, but marginally significant (at 10% level). Therefore, firms with higher concerns scores have higher total risk. Thus, the negative impact of SP on total risk seems to be mainly due to concerns.

Table 3.5: Relation between the risk measures and the aggregate measures of social performance

	Panel A: Total risk measures				Panel B: Idiosyncratic risk measures						Panel C: Systematic risk measures			
	Volatilityw	Volatilityw	dvolatilityw	dvolatilityw	sdresCAPMw	sdresCAPMw	sdresffw	sdresffw	sdres4ffw	sdres4ffw	mbetaw	mbetaw	mbetaffw	mbetaffw
SP	-0.1858***		-0.1165**		-0.0720		-0.0751		-0.0784*		-1.2386***		-0.9300***	
	(-3.05)		(-2.23)		(-1.54)		(-1.60)		(-1.69)		(-3.65)		(-3.20)	
Str		0.1316*		0.1305*		0.1132		0.1158*		0.1129		0.0712		-0.1542
		(1.74)		(1.74)		(1.63)		(1.67)		(1.65)		(0.17)		(-0.39)
Con		0.3738***		0.2634***		0.1817***		0.1880***		0.1915***		2.0118***		1.3803***
		(5.83)		(4.94)		(3.87)		(4.00)		(4.07)		(5.02)		(3.97)
lnmkteq	-0.0142***	-0.0236***	-0.0165***	-0.0238***	-0.0202***	-0.0257***	-0.0190***	-0.0247***	-0.0193***	-0.0249***	0.0388**	0.0001	0.0742***	0.0515***
	(-4.78)	(-6.96)	(-6.55)	(-7.60)	(-8.74)	(-8.53)	(-8.43)	(-8.37)	(-8.49)	(-8.41)	(2.36)	(0.01)	(5.16)	(3.12)
bmw	0.0414***	0.0275**	0.0360***	0.0247**	0.0360***	0.0275**	0.0324***	0.0237**	0.0298***	0.0211*	0.3504***	0.2935***	0.3733***	0.3399***
	(3.02)	(1.97)	(3.06)	(2.06)	(3.19)	(2.40)	(2.92)	(2.10)	(2.68)	(1.86)	(4.73)	(3.89)	(5.30)	(4.73)
netlevw	-0.0403*	-0.0424**	-0.0118	-0.0134	0.0025	0.0013	0.0023	0.0011	0.0018	0.0005	-0.3085***	-0.3172***	-0.1661	-0.1712*
	(-1.88)	(-2.09)	(-0.75)	(-0.90)	(0.18)	(0.09)	(0.17)	(0.08)	(0.13)	(0.04)	(-2.71)	(-2.88)	(-1.62)	(-1.69)
ret1y	0.0461***	0.0471***	-0.0369***	-0.0365***	-0.0348***	-0.0345***	-0.0328***	-0.0325***	-0.0306***	-0.0303***	0.0666	0.0709	0.0471	0.0497
	(3.73)	(3.83)	(-3.63)	(-3.57)	(-3.17)	(-3.13)	(-3.01)	(-2.98)	(-2.81)	(-2.77)	(1.24)	(1.32)	(0.87)	(0.91)
avgturnover	10.2976***	10.3282***	10.3728***	10.3871***	10.7083***	10.7191***	10.6837***	10.6948***	10.5752***	10.5863***	30.6981***	30.8267***	21.0082***	21.0865***
	(10.70)	(10.84)	(15.27)	(15.71)	(14.89)	(15.17)	(14.96)	(15.25)	(14.94)	(15.22)	(6.52)	(6.47)	(4.79)	(4.77)
cvturnover	-0.0034	-0.0041	0.0293***	0.0286***	0.0414***	0.0408***	0.0427***	0.0421***	0.0429***	0.0423***	-0.0001	-0.0029	-0.0444	-0.0461
	(-0.62)	(-0.75)	(4.80)	(4.72)	(6.78)	(6.70)	(6.92)	(6.84)	(6.98)	(6.90)	(-0.00)	(-0.10)	(-1.30)	(-1.37)
dispeps1w	-0.0636***	-0.0674***	-0.0155	-0.0181	-0.0115	-0.0134	-0.0109	-0.0129	-0.0144	-0.0165	-0.2540***	-0.2698***	-0.1291	-0.1385*
	(-3.60)	(-3.85)	(-1.07)	(-1.27)	(-0.77)	(-0.90)	(-0.73)	(-0.86)	(-0.99)	(-1.12)	(-3.11)	(-3.36)	(-1.56)	(-1.71)
investment	0.8513***	0.8183***	0.5573***	0.5308***	0.5377***	0.5178***	0.5263***	0.5058***	0.5231***	0.5026***	2.4691**	2.3338**	1.5845*	1.5051
	(4.20)	(4.31)	(4.23)	(4.28)	(4.27)	(4.31)	(4.33)	(4.37)	(4.36)	(4.40)	(2.22)	(2.17)	(1.69)	(1.63)
expgrthw	0.2400***	0.2268***	0.1866***	0.1768***	0.1668***	0.1594***	0.1733***	0.1658***	0.1743***	0.1667***	0.7498***	0.6951**	0.3419	0.3098
	(4.11)	(4.07)	(4.59)	(4.57)	(4.59)	(4.56)	(4.77)	(4.74)	(4.78)	(4.75)	(2.62)	(2.52)	(1.44)	(1.34)
zscorew	-0.0011	-0.0010	-0.0007	-0.0006	-0.0002	-0.0002	-0.0002	-0.0002	-0.0003	-0.0002	-0.0105	-0.0101	-0.0121*	-0.0119*
	(-0.76)	(-0.73)	(-0.84)	(-0.78)	(-0.27)	(-0.21)	(-0.29)	(-0.23)	(-0.35)	(-0.28)	(-1.35)	(-1.33)	(-1.81)	(-1.80)
sdroaw	0.8723***	0.8223***	0.4282***	0.3901***	0.4184***	0.3898***	0.4160***	0.3866***	0.4177***	0.3883***	3.5658***	3.3602***	2.8127***	2.6921***
	(4.72)	(4.49)	(4.70)	(4.26)	(4.61)	(4.29)	(4.67)	(4.34)	(4.69)	(4.36)	(4.70)	(4.36)	(3.96)	(3.74)
inv_basew	-0.0234***	-0.0228***	-0.0132**	-0.0128**	-0.0174***	-0.0172***	-0.0170***	-0.0167***	-0.0167***	-0.0164***	-0.0178	-0.0154	-0.0541	-0.0528
	(-3.19)	(-3.03)	(-2.25)	(-2.44)	(-3.20)	(-3.41)	(-3.17)	(-3.38)	(-3.09)	(-3.30)	(-0.37)	(-0.33)	(-1.16)	(-1.13)
Constant	0.3635***	0.4286***	0.3464***	0.3978***	0.3278***	0.3661***	0.3130***	0.3525***	0.3141***	0.3536***	0.6660***	0.9374***	0.4613***	0.6221***
	(10.91)	(11.90)	(11.89)	(12.35)	(12.18)	(12.10)	(11.84)	(11.86)	(11.84)	(11.83)	(3.75)	(5.09)	(2.92)	(3.68)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2344	2344	2389	2389	2389	2389	2389	2389	2389	2389	2344	2344	2344	2344
Number of firms	501	501	510	510	510	510	510	510	510	510	501	501	501	501
R-squared	0.529	0.544	0.650	0.660	0.661	0.667	0.647	0.654	0.642	0.649	0.406	0.418	0.302	0.307

Table 3.5 (Continued): Relation between the risk measures and the aggregate measures of social performance

	Panel D: VaR measures							
	avarhs	avarhs	avarrm	avarrm	avargarch	avargarch	avarfhs	avarfhs
SP	-0.4662***		-0.4901***		-0.5743***		-0.3686***	
	(-3.23)		(-3.30)		(-3.11)		(-2.63)	
Str		0.2124		0.2931		0.3061		0.2970
		(1.12)		(1.57)		(1.37)		(1.44)
Con		0.8649***		0.9577***		1.0982***		0.7627***
		(5.58)		(5.74)		(4.99)		(5.12)
lnmkteq	-0.0359***	-0.0561***	-0.0233***	-0.0468***	-0.0442***	-0.0707***	-0.0467***	-0.0667***
	(-5.16)	(-6.55)	(-3.15)	(-5.43)	(-4.20)	(-5.46)	(-6.38)	(-6.96)
bmw	0.1178***	0.0880**	0.0582*	0.0236	0.0561	0.0176	0.1193***	0.0900**
	(3.02)	(2.22)	(1.82)	(0.72)	(1.46)	(0.44)	(2.97)	(2.21)
netlevw	-0.0201	-0.0266	-0.0723	-0.0798	-0.0842	-0.0927	0.0118	0.0050
	(-0.45)	(-0.62)	(-1.32)	(-1.56)	(-1.34)	(-1.58)	(0.26)	(0.12)
ret1y	0.1395***	0.1415***	0.1548***	0.1571***	0.1690***	0.1715***	0.0274	0.0293
	(3.64)	(3.71)	(4.88)	(4.99)	(4.52)	(4.61)	(0.80)	(0.85)
avgturnover	21.4766***	21.5182***	18.5813***	18.6271***	18.5270***	18.5639***	25.2055***	25.2283***
	(9.15)	(9.19)	(8.66)	(8.70)	(6.93)	(6.97)	(9.76)	(9.74)
cvturnover	0.0280	0.0274	0.0059	0.0052	0.0245	0.0241	0.0365**	0.0363**
	(1.29)	(1.28)	(0.34)	(0.31)	(1.23)	(1.21)	(2.21)	(2.23)
dispeps1w	-0.1443***	-0.1521***	-0.1914***	-0.2004***	-0.1899***	-0.2002***	-0.1381***	-0.1458***
	(-3.76)	(-3.99)	(-4.71)	(-4.92)	(-4.06)	(-4.31)	(-3.77)	(-3.97)
investment	1.3221***	1.2631***	1.6513***	1.5829***	1.7823***	1.7057***	1.3659***	1.3057***
	(3.01)	(3.05)	(3.47)	(3.56)	(3.23)	(3.29)	(3.58)	(3.63)
expgrthw	0.5200***	0.4906***	0.5784***	0.5441***	0.6129***	0.5743***	0.4353***	0.4058***
	(3.93)	(3.83)	(3.69)	(3.64)	(3.48)	(3.41)	(3.74)	(3.62)
zscorew	0.0019	0.0019	0.0015	0.0015	0.0042	0.0042	0.0019	0.0020
	(0.80)	(0.83)	(0.37)	(0.38)	(0.87)	(0.88)	(0.88)	(0.92)
sdroaw	2.3598***	2.2402***	2.6728***	2.5337***	2.7907***	2.6339***	1.5660***	1.4480***
	(5.08)	(4.79)	(5.14)	(4.86)	(4.89)	(4.61)	(5.81)	(5.24)
inv_basew	-0.0092	-0.0080	-0.0136	-0.0122	-0.0303	-0.0287	-0.0238	-0.0227
	(-0.52)	(-0.47)	(-0.73)	(-0.68)	(-1.43)	(-1.42)	(-1.48)	(-1.47)
Constant	0.8820***	1.0226***	0.5369***	0.7002***	0.7966***	0.9803***	0.9701***	1.1091***
	(10.70)	(11.27)	(6.73)	(8.02)	(7.46)	(8.05)	(11.61)	(11.68)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2241	2241	2241	2241	2237	2237	2224	2224
Number of firms	460	460	460	460	459	459	454	454
R-squared	0.541	0.552	0.516	0.530	0.426	0.439	0.536	0.547

Note:

Table 3.5 reports results from OLS regressions of the risk measures on the social performance measures and controls over the period 1991–2007. The risk measures are systematic risk (mbetaw and mbetaffw), idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw), total risk (volatilityw and dvolatilityw), and the annualized 1% VaR (avarhsw, avarrmw, avargarchw and avarfhsw). SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). The explanatory variables are firm size (lnmkteq), the book-to-market ratio (bmw), net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment (sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets), expected growth in earnings (expgrthw), Altman's (1993) distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and investor base (inv_basew). All variables are defined in footnotes of Table 3.1. Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

3.5.2.2. Impact of Social Performance on Idiosyncratic Risk

Based on Panel B of Table 3.5, the aggregate measure of social performance (SP), which combines strengths and concerns, is not related to idiosyncratic risk. Unlike that for the aggregate strengths measure (Str), the coefficients associated with the aggregate measure of concerns (Con) are positive and statistically significant regardless of the idiosyncratic risk metric used. Therefore, firms having lower social performance based on concerns (but not strengths) scores have higher idiosyncratic risk.

3.5.2.3. Impact of Social Performance on Systematic Risk

Based on Panel C of Table 3.5, the aggregate combined measure of social performance (SP) is significantly and negatively related to systematic risk. Again, unlike that for the aggregate strengths measure (Str), the coefficient associated with the aggregate measure of concerns (Con) is positive and statistically significant in both specifications. Thus, social performance in aggregate is negatively related to systematic risk mainly due to concerns.

3.5.2.4. Impact of Social Performance on Value at Risk (VaR)

Based on Panel D of Table 3.5, the aggregate combined measure of SP is significantly and negatively related to all VaR measures. The coefficients associated with the aggregate measure of concerns (Con) are positive and statistically significant for all specifications. None of the coefficients associated with the aggregate strengths measure (Str) are significant. Thus, social performance in aggregate is negatively related to VaR mainly due to concerns.

3.5.3. Impact of the Dimensions of Social Performance on a Financial Firm's Risk

Table 3.6 reports the results of the regressions between the risk measures and the social performance dimensions. The results suggest that some SP dimensions (such as Employee Relations, Product and Corporate Governance) are more relevant for a financial firm's risk. Specifically, Employee Relations are significantly and negatively related to stock return volatility, idiosyncratic risk and VaR. Product and Corporate Governance are significantly and negatively related to volatility, idiosyncratic risk, systematic risk and VaR.

To a lesser extent, other SP dimensions (e.g., Diversity and Human Rights) affect some risk measures. Diversity is significantly and positively related to idiosyncratic risk measured using the three-factor model, whereas Human Rights are significantly and negatively related to volatility computed using five-year monthly returns, and VaR computed using the GARCH model. Except for these special cases, all coefficients associated with these two dimensions as well as those associated with Community and Environment are not significant at conventional levels (i.e., 5%).

Table 3.6: Relation between the risk measures and the social performance dimensions

	Total risk		Idiosyncratic risk			Systematic risk	
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	mbetaw	mbetaffw
ave_com	0.0220	0.0124	0.0079	0.0061	0.0060	-0.0394	-0.0987
	(1.16)	(0.68)	(0.46)	(0.35)	(0.35)	(-0.39)	(-1.05)
ave_div	0.0091	0.0175	0.0212*	0.0217**	0.0208*	-0.0159	-0.0014
	(0.55)	(1.48)	(1.95)	(2.01)	(1.93)	(-0.19)	(-0.02)
ave_emp	-0.0619**	-0.0378**	-0.0396**	-0.0383**	-0.0376**	-0.1233	-0.0476
	(-2.55)	(-2.36)	(-2.57)	(-2.50)	(-2.46)	(-0.91)	(-0.38)
ave_env	0.0293	-0.0738	-0.0049	-0.0001	-0.0013	-0.4552	-0.6541*
	(0.46)	(-0.98)	(-0.07)	(-0.00)	(-0.02)	(-1.20)	(-1.89)
ave_non	-0.1103**	-0.0252	0.0156	0.0161	0.0144	-0.5181*	-0.2694
	(-2.11)	(-0.74)	(0.57)	(0.60)	(0.55)	(-1.71)	(-1.16)
ave_pro	-0.0519***	-0.0515***	-0.0336**	-0.0366**	-0.0371**	-0.3448***	-0.2466**
	(-2.77)	(-3.11)	(-2.24)	(-2.44)	(-2.50)	(-2.88)	(-2.39)
ave_oth	-0.0646***	-0.0451***	-0.0435***	-0.0431***	-0.0438***	-0.3806***	-0.3151***
	(-3.00)	(-3.07)	(-3.50)	(-3.47)	(-3.54)	(-3.29)	(-2.85)
lnmkteq	-0.0222***	-0.0234***	-0.0257***	-0.0248***	-0.0250***	-0.0015	0.0453***
	(-6.41)	(-7.08)	(-8.05)	(-7.93)	(-7.95)	(-0.09)	(2.74)
bmw	0.0307**	0.0270**	0.0297***	0.0260**	0.0234**	0.3106***	0.3534***
	(2.25)	(2.37)	(2.68)	(2.38)	(2.14)	(4.15)	(4.97)
netlevw	-0.0409*	-0.0114	0.0021	0.0022	0.0016	-0.3113***	-0.1710
	(-1.91)	(-0.72)	(0.16)	(0.16)	(0.11)	(-2.69)	(-1.63)
ret1y	0.0435***	-0.0390***	-0.0365***	-0.0346***	-0.0323***	0.0610	0.0457
	(3.56)	(-3.86)	(-3.36)	(-3.22)	(-3.01)	(1.14)	(0.84)
avgturnover	10.0707***	10.1679***	10.4943***	10.4681***	10.3601***	29.4284***	19.8453***
	(10.36)	(15.09)	(14.74)	(14.81)	(14.78)	(6.36)	(4.50)
cvturnover	-0.0041	0.0288***	0.0410***	0.0424***	0.0425***	-0.0027	-0.0462
	(-0.72)	(4.72)	(6.68)	(6.81)	(6.87)	(-0.09)	(-1.37)
dispeps1w	-0.0638***	-0.0143	-0.0100	-0.0094	-0.0130	-0.2514***	-0.1239
	(-3.51)	(-0.98)	(-0.65)	(-0.61)	(-0.85)	(-3.15)	(-1.56)
investment	0.8231***	0.5329***	0.5168***	0.5055***	0.5024***	2.3802**	1.5339
	(4.03)	(4.12)	(4.20)	(4.27)	(4.29)	(2.12)	(1.63)
expgrthw	0.2307***	0.1789***	0.1604***	0.1670***	0.1680***	0.7085**	0.3127
	(4.07)	(4.52)	(4.52)	(4.69)	(4.70)	(2.56)	(1.35)
zscorew	-0.0010	-0.0006	-0.0001	-0.0001	-0.0002	-0.0100	-0.0116*
	(-0.74)	(-0.73)	(-0.18)	(-0.19)	(-0.25)	(-1.28)	(-1.74)
sdroaw	0.8554***	0.4204***	0.4132***	0.4106***	0.4123***	3.5147***	2.7980***
	(4.63)	(4.68)	(4.61)	(4.68)	(4.69)	(4.56)	(3.87)
inv_basew	-0.0232***	-0.0133**	-0.0180***	-0.0176***	-0.0173***	-0.0192	-0.0583
	(-3.06)	(-2.47)	(-3.53)	(-3.49)	(-3.41)	(-0.40)	(-1.24)
Constant	0.4279***	0.4069***	0.3786***	0.3656***	0.3666***	0.9943***	0.7052***
	(11.32)	(11.92)	(11.64)	(11.48)	(11.46)	(5.25)	(4.10)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2344	2389	2389	2389	2389	2344	2344
Number of firms	501	510	510	510	510	501	501
R-squared	0.542	0.659	0.668	0.655	0.650	0.417	0.308

Table 3.6 (Continued): Relation between the risk measures and the social performance dimensions

	Panel D: VaR measures			
	avarhs	**avarrm**	**avargarch**	**avarfhs**
ave_com	0.0368	0.0734	0.0515	0.0399
	(0.78)	(1.64)	(0.89)	(0.79)
ave_div	0.0193	0.0089	0.0143	0.0164
	(0.54)	(0.23)	(0.30)	(0.46)
ave_emp	-0.1486***	-0.1823***	-0.1833***	-0.0470
	(-2.83)	(-3.24)	(-2.64)	(-0.90)
ave_env	0.1047	0.0528	0.1254	-0.1679
	(0.69)	(0.30)	(0.70)	(-0.92)
ave_non	-0.1620	-0.2060*	-0.3239**	-0.1211
	(-1.54)	(-1.75)	(-2.21)	(-1.28)
ave_pro	-0.1350***	-0.1492***	-0.1532***	-0.1456***
	(-2.75)	(-2.93)	(-2.69)	(-2.89)
ave_oth	-0.1660***	-0.1335**	-0.1759***	-0.1430***
	(-3.22)	(-2.29)	(-2.64)	(-3.16)
lnmkteq	-0.0552***	-0.0422***	-0.0660***	-0.0662***
	(-5.85)	(-4.50)	(-5.25)	(-6.49)
bmw	0.0930**	0.0268	0.0258	0.0958**
	(2.43)	(0.84)	(0.66)	(2.45)
netlevw	-0.0223	-0.0722	-0.0855	0.0100
	(-0.49)	(-1.31)	(-1.36)	(0.21)
ret1y	0.1323***	0.1456***	0.1605***	0.0222
	(3.46)	(4.58)	(4.31)	(0.65)
avgturnover	20.8432***	18.1445***	17.9240***	24.6175***
	(8.80)	(8.38)	(6.59)	(9.61)
cvturnover	0.0269	0.0049	0.0231	0.0358**
	(1.24)	(0.28)	(1.15)	(2.16)
dispeps1w	-0.1413***	-0.1895***	-0.1897***	-0.1334***
	(-3.58)	(-4.52)	(-3.95)	(-3.54)
investment	1.2705***	1.5920***	1.7214***	1.3303***
	(2.91)	(3.35)	(3.10)	(3.49)
expgrthw	0.4969***	0.5530***	0.5865***	0.4129***
	(3.86)	(3.65)	(3.43)	(3.68)
zscorew	0.0020	0.0016	0.0043	0.0021
	(0.86)	(0.39)	(0.90)	(0.98)
sdroaw	2.3140***	2.6184***	2.7314***	1.5266***
	(5.00)	(5.07)	(4.81)	(5.57)
inv_basew	-0.0088	-0.0111	-0.0289	-0.0234
	(-0.53)	(-0.62)	(-1.41)	(-1.51)
Constant	1.0445***	0.6931***	0.9719***	1.1341***
	(10.58)	(7.24)	(7.98)	(11.42)
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Observations	2241	2241	2237	2224
Number of firms	460	460	459	454
R-squared	0.552	0.528	0.437	0.545

Note:

Table 3.6 reports results from OLS regressions of the risk measures on the individual dimensions of SP and controls over the period 1991–2007. The risk measures are systematic risk (mbetaw and mbetaffw), idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw), total risk (volatilityw and dvolatilityw), and the annualized 1% VaR (avarhsw, avarrmw, avargarchw and avarfhsw). The individual dimensions of SP are Community relations (ave_com), Diversity (ave_div), Employee relations (ave_emp), Environmental performance (ave_env), Human Rights (ave_non), Product (ave_pro), and Corporate Governance (ave_oth), respectively. The explanatory variables are firm size (lnmkteq), the book-to-market ratio (bmw), net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment (sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets), expected growth in earnings (expgrthw), Altman's (1993) distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and investor base (inv_basew). All variables are defined in footnotes of Table 3.1. Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

The mean values of Employee relations, Product and Corporate Governance are negative (see Table 3.1) with concerns exceeding strengths, which suggests that their negative impact on risk appear to be induced by concerns. Since aggregate combined measures of SP dimensions might have some limitations (e.g., important information about SP might be lost due to aggregation), the next section examines the impact of strengths and concerns separately for each SP dimension.

3.5.4. Impact of the Strengths and Concerns of SP Dimensions on a Financial Firm's Risk

Table 3.7 reports the results of the regressions between the risk measures and the strengths and concerns of each SP dimensions. Table 3.7 shows that the impact of some SP dimensions (e.g., Community, Diversity, Environment and Human Rights) on the risk measures does not exhibit significant patterns in the sense that only some of their associated coefficients are significant with some specific models. For example, Community strengths are significantly and negatively related to both measures of systematic risk, whereas Community concerns are significantly and negatively related (counter to expectations) to the VaR measured using the Risk Metric model. Environment strengths are significantly and

negatively related to the volatility measured using one-year daily returns and systematic risk measured using the three-factor model. Human Rights concerns are significantly and positively related to total risk measured using five-year monthly returns, and to the VaR measured using the GARCH model. All coefficients associated with Diversity as well as Environment concerns are insignificant regardless of the risk measure used.

Table 3.7: Relation between the risk measures and strengths and concerns of SP dimensions

	Total risk		Idiosyncratic risk			Systematic risk	
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	mbetaw	mbetaffw
avestr_com	-0.0307	-0.0180	-0.0124	-0.0141	-0.0146	-0.3617***	-0.2973**
	(-1.37)	(-0.83)	(-0.63)	(-0.72)	(-0.76)	(-2.74)	(-2.28)
avecon_com	-0.0483*	-0.0224	-0.0111	-0.0081	-0.0084	-0.2503*	-0.1227
	(-1.78)	(-0.88)	(-0.42)	(-0.30)	(-0.31)	(-1.70)	(-0.84)
avestr_div	0.0466*	0.0276	0.0304	0.0308*	0.0318*	0.0703	-0.0943
	(1.70)	(1.38)	(1.61)	(1.65)	(1.72)	(0.49)	(-0.66)
avecon_div	0.0157	-0.0088	-0.0141	-0.0143	-0.0125	0.0662	-0.0472
	(0.85)	(-0.62)	(-1.06)	(-1.08)	(-0.93)	(0.62)	(-0.46)
avestr_emp	0.0240	0.0163	0.0031	0.0048	0.0032	0.2854	0.3187*
	(0.84)	(0.66)	(0.14)	(0.21)	(0.14)	(1.50)	(1.83)
avecon_emp	0.1318***	0.0802***	0.0727***	0.0718***	0.0691***	0.4477**	0.3480**
	(3.65)	(3.55)	(3.38)	(3.39)	(3.27)	(2.36)	(2.10)
avestr_env	-0.0774	-0.1886**	-0.1018	-0.0999	-0.0984	-0.6472	-0.8512**
	(-0.91)	(-2.18)	(-1.33)	(-1.38)	(-1.33)	(-1.48)	(-2.42)
avecon_env	-0.1036	0.0032	-0.0556	-0.0608	-0.0580	0.3883	0.5763
	(-1.44)	(0.03)	(-0.74)	(-0.83)	(-0.79)	(0.76)	(1.38)
avecon_non	0.1356**	0.0368	-0.0111	-0.0146	-0.0136	0.6255*	0.2914
	(2.14)	(0.96)	(-0.35)	(-0.47)	(-0.44)	(1.93)	(1.05)
avestr_pro	0.1181**	0.1233**	0.0932*	0.0970*	0.0935*	0.5859*	0.5782*
	(2.20)	(1.99)	(1.81)	(1.91)	(1.88)	(1.72)	(1.79)
avecon_pro	0.0752***	0.0768***	0.0516***	0.0557***	0.0554***	0.4989***	0.4082***
	(3.58)	(4.41)	(3.22)	(3.47)	(3.47)	(3.90)	(3.53)
avestr_oth	-0.0497*	-0.0115	-0.0140	-0.0143	-0.0135	-0.2714*	-0.2721*
	(-1.70)	(-0.52)	(-0.69)	(-0.72)	(-0.68)	(-1.94)	(-1.67)
avecon_oth	0.0733***	0.0713***	0.0650***	0.0645***	0.0656***	0.4805***	0.4038***
	(2.63)	(3.59)	(3.76)	(3.77)	(3.86)	(3.07)	(2.91)
lnmkteq	-0.0271***	-0.0276***	-0.0290***	-0.0281***	-0.0284***	-0.0222	0.0311*
	(-7.12)	(-7.53)	(-8.22)	(-8.13)	(-8.15)	(-1.17)	(1.76)
bmw	0.0302**	0.0268**	0.0290***	0.0253**	0.0227**	0.3210***	0.3618***
	(2.23)	(2.32)	(2.59)	(2.29)	(2.06)	(4.26)	(5.02)
netlevw	-0.0441**	-0.0146	-0.0002	-0.0003	-0.0010	-0.3236***	-0.1744*
	(-2.29)	(-1.04)	(-0.01)	(-0.03)	(-0.08)	(-3.08)	(-1.79)
ret1y	0.0462***	-0.0369***	-0.0349***	-0.0329***	-0.0307***	0.0745	0.0544
	(3.76)	(-3.62)	(-3.20)	(-3.05)	(-2.84)	(1.39)	(0.98)
avgturnover	10.0640***	10.1310***	10.4640***	10.4345***	10.3313***	29.2699***	19.4567***
	(10.45)	(15.44)	(15.00)	(15.06)	(15.02)	(6.43)	(4.43)
cvturnover	-0.0043	0.0287***	0.0410***	0.0423***	0.0424***	-0.0045	-0.0453
	(-0.79)	(4.72)	(6.65)	(6.78)	(6.83)	(-0.15)	(-1.36)
dispeps1w	-0.0664***	-0.0175	-0.0124	-0.0119	-0.0154	-0.2577***	-0.1290
	(-3.60)	(-1.23)	(-0.81)	(-0.77)	(-1.01)	(-3.21)	(-1.61)
investment	0.7875***	0.5057***	0.4961***	0.4839***	0.4814***	2.2221**	1.4047
	(4.29)	(4.35)	(4.34)	(4.42)	(4.46)	(2.12)	(1.54)
expgrthw	0.2138***	0.1672***	0.1518***	0.1582***	0.1591***	0.6302**	0.2724
	(3.99)	(4.54)	(4.49)	(4.67)	(4.68)	(2.40)	(1.23)
zscorew	-0.0010	-0.0005	-0.0001	-0.0001	-0.0002	-0.0096	-0.0113*
	(-0.74)	(-0.72)	(-0.14)	(-0.15)	(-0.21)	(-1.28)	(-1.72)
sdroaw	0.8108***	0.3851***	0.3856***	0.3823***	0.3842***	3.3154***	2.6525***
	(4.46)	(4.41)	(4.43)	(4.49)	(4.50)	(4.30)	(3.66)
inv_basew	-0.0249***	-0.0145***	-0.0189***	-0.0186***	-0.0182***	-0.0259	-0.0600
	(-3.40)	(-2.61)	(-3.54)	(-3.53)	(-3.46)	(-0.57)	(-1.37)
Constant	0.4657***	0.4365***	0.4016***	0.3893***	0.3904***	1.1680***	0.8179***
	(11.81)	(12.02)	(11.73)	(11.59)	(11.56)	(5.87)	(4.56)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2344	2389	2389	2389	2389	2344	2344
Number of firms	501	510	510	510	510	501	501
R-squared	0.559	0.672	0.676	0.664	0.659	0.437	0.324

Table 3.7 (Continued): Relation between the risk measures and strengths and concerns of SP dimensions

	Panel D: VaR measures			
	avarhs	avarrm	avargarch	avarfhs
avestr_com	-0.0557	-0.0304	-0.0417	-0.0644
	(-0.91)	(-0.56)	(-0.65)	(-0.99)
avecon_com	-0.0869	-0.1215**	-0.0698	-0.1049
	(-1.29)	(-2.22)	(-0.87)	(-1.54)
avestr_div	0.0659	0.0509	0.0626	0.0684
	(1.11)	(0.88)	(0.93)	(1.08)
avecon_div	0.0156	0.0271	0.0329	0.0194
	(0.36)	(0.58)	(0.54)	(0.45)
avestr_emp	-0.0298	-0.0171	-0.0153	0.0329
	(-0.42)	(-0.26)	(-0.20)	(0.43)
avecon_emp	0.2443***	0.3198***	0.3253***	0.1066
	(3.20)	(3.55)	(2.84)	(1.65)
avestr_env	-0.0641	0.0213	0.0311	-0.3122
	(-0.30)	(0.08)	(0.12)	(-1.43)
avecon_env	-0.1988	0.0150	-0.1172	0.1014
	(-0.88)	(0.06)	(-0.42)	(0.30)
avecon_non	0.1656	0.2325*	0.3917**	0.1324
	(1.33)	(1.69)	(2.28)	(1.19)
avestr_pro	0.2606*	0.3201**	0.3337*	0.2973*
	(1.84)	(2.06)	(1.96)	(1.87)
avecon_pro	0.1913***	0.2159***	0.2161***	0.2087***
	(3.38)	(3.75)	(3.41)	(3.67)
avestr_oth	-0.0740	-0.0672	-0.1096	-0.0393
	(-1.13)	(-0.89)	(-1.15)	(-0.58)
avecon_oth	0.2312***	0.1827**	0.2208***	0.2172***
	(3.54)	(2.49)	(2.71)	(3.56)
lnmkteq	-0.0653***	-0.0538***	-0.0790***	-0.0762***
	(-6.31)	(-5.26)	(-5.63)	(-6.74)
bmw	0.0929**	0.0257	0.0232	0.0982**
	(2.41)	(0.83)	(0.59)	(2.48)
netlevw	-0.0324	-0.0830*	-0.0977*	-0.0025
	(-0.78)	(-1.69)	(-1.71)	(-0.06)
retly	0.1390***	0.1535***	0.1688***	0.0291
	(3.67)	(4.87)	(4.53)	(0.86)
avgturnover	20.8444***	18.1316***	17.9266***	24.6251***
	(8.75)	(8.27)	(6.52)	(9.73)
cvturnover	0.0255	0.0042	0.0224	0.0339**
	(1.19)	(0.24)	(1.12)	(2.07)
dispepslw	-0.1455***	-0.1947***	-0.1981***	-0.1376***
	(-3.64)	(-4.51)	(-4.03)	(-3.61)
investment	1.2185***	1.5269***	1.6525***	1.2818***
	(3.08)	(3.56)	(3.25)	(3.76)
expgrthw	0.4620***	0.5157***	0.5474***	0.3740***
	(3.79)	(3.61)	(3.38)	(3.59)
zscorew	0.0020	0.0016	0.0043	0.0021
	(0.91)	(0.41)	(0.91)	(1.07)
sdroaw	2.2056***	2.4919***	2.5959***	1.4181***
	(4.75)	(4.85)	(4.59)	(5.16)
inv_basew	-0.0115	-0.0137	-0.0315	-0.0269
	(-0.65)	(-0.72)	(-1.47)	(-1.62)
Constant	1.1233***	0.7809***	1.0638***	1.2139***
	(10.69)	(7.65)	(8.11)	(11.32)
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Observations	2241	2241	2237	2224
Number of firms	460	460	459	454
R-squared	0.564	0.543	0.449	0.559

Note:

Table 3.7 reports results from OLS regressions of the risk measures on the strengths and concerns of the individual dimensions of SP and controls over the period 1991–2007. The risk measures are systematic risk (mbetaw and mbetaffw), idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw), total risk (volatilityw and dvolatilityw), and the annualized 1% VaR (avarhsw, avarrmw, avargarchw and avarfhsw). The strengths and concerns of the individual dimensions of SP are Community strengths (avestr_com), Community concerns (avecon_com), Diversity strengths (avestr_div), Diversity concerns (avecon_div), Employee strengths (avestr_emp), Employee concerns (avecon_emp), Environment strengths (avestr_env), Environment concerns (avecon_env), Human Rights concerns (avecon_non), Product strengths (avestr_pro), Product concerns (avecon_pro), Corporate Governance strengths (avestr_oth), and Corporate Governance concerns (avecon_oth), respectively. Human Rights strengths (avestr_non) are excluded. The explanatory variables are firm size (lnmkteq), the book-to-market ratio (bmw), net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment (sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets), expected growth in earnings (expgrthw), Altman's (1993) distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and investor base (inv_basew). All variables are defined in footnotes of Table 3.1. Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

In contrast, the impacts on a firm's risk of Employee Relations, Product and Corporate Governance exhibit significant patterns. Employee concerns are significantly and positively related to total risk, idiosyncratic risk, systematic risk, and the VaR for all specifications, except for the one measured using filtered historical simulation. All coefficients associated with Employee strengths are insignificant regardless of the risk measure used. Similar to Employee concerns, Product and Corporate Governance concerns are significantly and positively related to total risk, idiosyncratic risk, systematic risk, and the VaR for all specifications. All coefficients associated with Corporate Governance strengths are insignificant regardless of the risk measure used. However, Product strengths are significantly and positively related to total risk and the VaR measured using the Risk Metric model.

Overall, three main conclusions can be drawn from the results reported in table 3.7. First, Employee, Product and Corporate Governance concerns positively affect total risk, idiosyncratic risk, systematic risk, and the Value at Risk (VaR). Second, Product strengths positively affect total risk. Third, Community, Diversity, Environment and Human Rights have no systematically significant impact on total risk or the VaR measures.

3.5.5. Robustness Checks

3.5.5.1. Endogeneity of Social Performance

To this point of our analysis, the social performance measures are implicitly assumed exogenous. If SP measures are endogenous for any reason, their associated coefficient estimates using standard OLS would be biased and inconsistent. Endogeneity issues may arise if some of the regressors (e.g., firm size) and/or unobserved (omitted) variables affect both SP measures and the firm's risk measures. To address this potential endogeneity problem, we use the instrumental variables (IV) method. The IV regressions are estimated using the two-step efficient generalized method of moments (GMM):[83]

$$SP_{it} = \gamma + \eta Z^{SP}_{it-1} + +\theta Y^{SP}_{it-1} + \omega_{it} \qquad (9)$$

$$Risk_{it} = \alpha_0 + \alpha_1 SP^{*}_{it-1} + \delta X_{it-1} + \varepsilon_{it} \qquad (10)$$

where Z^{SP}_{it} denotes instruments, and Y^{SP}_{it} denotes variables that affect social performance. Instruments should be correlated with the SP measure, but have zero or low correlation with the firm's risk measure. We use three instruments: lagged SP, the median industry SP and a dummy variable for loss firms (i.e., those with negative free cash flow in the previous year). The first two instruments allow us to control for the persistence of the SP measures and for industry SP. The third instrument is used to control for the argument suggested by the slack resources theory in which non profitable firms may simply not be able

[83] The GMM estimation generates efficient estimates of the coefficients and consistent estimates of the standard errors that are robust to the presence of arbitrary heteroskedasticity and clustering by firm.

to make CSR investments.[84] In the first stage, there are as many equations as endogenous variables. In the second stage, we use the fitted values of the first-stage SP measures as the explanatory variables instead of their original values. Only the results of the second stage estimation are reported in Table 3.8.

[84] The slack resources theory suggests that profitable firms (e.g., those with higher past financial performance) can improve their SP through CSR investments (McGuire *et al.*, 1988; Waddock and Graves, 1997).

Table 3.8: Instrumental variables regressions between the risk measures and the aggregate measures of social performance

	Panel A: Total risk measures				Panel B: Idiosyncratic risk measures						Panel C: Systematic risk measures			
	Volatilityw	Volatilityw	dvolatilityw	dvolatilityw	sdresCAPMw	sdresCAPMw	sdresffw	sdresffw	sdres4ffw	sdres4ffw	mbetaw	mbetaw	mbetaffw	mbetaffw
SP	-0.2059***		-0.1067		-0.0253		-0.0350		-0.0403		-1.7049***		-1.2434***	
	(-2.63)		(-1.64)		(-0.45)		(-0.62)		(-0.72)		(-3.89)		(-3.35)	
Str		0.1119		0.1150		0.1476*		0.1444*		0.1411*		-0.2108		-0.1750
		(1.16)		(1.28)		(1.80)		(1.77)		(1.75)		(-0.38)		(-0.35)
Con		0.3979***		0.2377***		0.1284**		0.1392**		0.1453**		2.5683***		1.8222***
		(5.00)		(3.66)		(2.23)		(2.45)		(2.57)		(5.29)		(4.27)
lnmkteq	-0.0126***	-0.0222***	-0.0129***	-0.0196***	-0.0159***	-0.0211***	-0.0150***	-0.0204***	-0.0153***	-0.0208***	0.0379**	-0.0094	0.0730***	0.0409**
	(-4.30)	(-6.19)	(-5.20)	(-5.63)	(-6.80)	(-6.38)	(-6.60)	(-6.31)	(-6.72)	(-6.40)	(2.29)	(-0.50)	(5.13)	(2.34)
bmw	0.0513***	0.0351**	0.0438***	0.0319**	0.0393***	0.0303**	0.0371***	0.0276**	0.0342***	0.0246**	0.4152***	0.3370***	0.3706***	0.3211***
	(3.55)	(2.36)	(3.55)	(2.48)	(3.28)	(2.43)	(3.14)	(2.24)	(2.89)	(2.00)	(5.08)	(4.02)	(4.95)	(4.16)
netlevw	-0.0228	-0.0264	-0.0037	-0.0082	0.0062	0.0033	0.0088	0.0054	0.0089	0.0054	-0.2278*	-0.2473**	-0.1666	-0.1793*
	(-1.04)	(-1.26)	(-0.24)	(-0.56)	(0.46)	(0.26)	(0.66)	(0.42)	(0.68)	(0.42)	(-1.92)	(-2.17)	(-1.60)	(-1.75)
ret1y	0.0527***	0.0503***	-0.0268**	-0.0277**	-0.0246**	-0.0250**	-0.0233*	-0.0237*	-0.0213*	-0.0217*	0.1335**	0.1210*	0.0726	0.0672
	(3.99)	(3.81)	(-2.24)	(-2.31)	(-1.98)	(-2.01)	(-1.90)	(-1.93)	(-1.73)	(-1.76)	(2.16)	(1.94)	(1.24)	(1.15)
avgturnover	9.8925***	9.8931***	10.0373***	10.0715***	10.5742***	10.6047***	10.5543***	10.5789***	10.4571***	10.4815***	29.3273***	29.2164***	20.3994***	20.5152***
	(10.18)	(10.32)	(14.52)	(15.00)	(14.28)	(14.55)	(14.35)	(14.62)	(14.35)	(14.61)	(5.79)	(5.69)	(4.50)	(4.51)
cvturnover	0.0016	0.0001	0.0411***	0.0397***	0.0539***	0.0528***	0.0560***	0.0548***	0.0560***	0.0548***	0.0005	-0.0086	-0.0507	-0.0572
	(0.24)	(0.02)	(4.89)	(4.83)	(6.02)	(5.97)	(6.14)	(6.09)	(6.18)	(6.13)	(0.01)	(-0.22)	(-1.23)	(-1.43)
dispeps1w	-0.0716***	-0.0763***	-0.0145	-0.0182	-0.0111	-0.0136	-0.0108	-0.0134	-0.0147	-0.0174	-0.2860***	-0.3048***	-0.1559*	-0.1738**
	(-3.76)	(-4.02)	(-0.93)	(-1.19)	(-0.70)	(-0.85)	(-0.67)	(-0.83)	(-0.93)	(-1.09)	(-3.21)	(-3.48)	(-1.76)	(-2.03)
investment	0.8440***	0.8140***	0.4339***	0.4150***	0.4243***	0.4095***	0.4217***	0.4064***	0.4207***	0.4053***	2.2823*	2.1214*	2.0284**	1.9303**
	(3.57)	(3.71)	(3.25)	(3.35)	(3.40)	(3.45)	(3.45)	(3.52)	(3.50)	(3.58)	(1.84)	(1.79)	(2.02)	(1.97)
expgrthw	0.2383***	0.2248***	0.1387***	0.1324***	0.1298***	0.1233***	0.1346***	0.1285***	0.1355***	0.1295***	0.6299**	0.5744**	0.4583*	0.4104*
	(3.78)	(3.77)	(3.42)	(3.45)	(3.59)	(3.56)	(3.69)	(3.69)	(3.69)	(3.70)	(2.11)	(2.03)	(1.85)	(1.72)
zscorew	0.0003	0.0003	0.0003	0.0001	0.0004	0.0004	0.0006	0.0005	0.0006	0.0004	-0.0036	-0.0041	-0.0094	-0.0095
	(0.23)	(0.19)	(0.37)	(0.17)	(0.54)	(0.43)	(0.72)	(0.58)	(0.70)	(0.56)	(-0.34)	(-0.39)	(-1.20)	(-1.21)
sdroaw	0.9161***	0.8745***	0.4601***	0.4153***	0.4191***	0.3860***	0.4213***	0.3862***	0.4233***	0.3875***	4.0390***	3.7551***	2.4362***	2.2594***
	(3.99)	(3.88)	(4.31)	(3.88)	(3.95)	(3.63)	(4.04)	(3.71)	(4.06)	(3.72)	(5.01)	(4.61)	(3.74)	(3.41)
inv_basew	-0.0202***	-0.0190**	-0.0111*	-0.0107**	-0.0177***	-0.0174***	-0.0169***	-0.0166***	-0.0164***	-0.0161***	0.0063	0.0098	-0.0227	-0.0218
	(-2.68)	(-2.40)	(-1.89)	(-2.03)	(-3.10)	(-3.29)	(-3.01)	(-3.19)	(-2.91)	(-3.09)	(0.12)	(0.19)	(-0.45)	(-0.43)
Constant	0.2102***	0.2758***	0.3089***	0.3557***	0.2598***	0.2957***	0.2307***	0.2687***	0.2253***	0.2639***	0.2303	0.5585***	-0.0797	0.1435
	(6.48)	(7.64)	(10.96)	(10.57)	(9.82)	(9.20)	(8.90)	(8.53)	(8.62)	(8.31)	(1.30)	(3.00)	(-0.52)	(0.84)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1970	1970	1971	1971	1971	1971	1971	1971	1971	1971	1970	1970	1970	1970
Number of firms	430	430	430	430	430	430	430	430	430	430	430	430	430	430
J statistic p-value	0.6272	0.5064	0.8383	0.9243	0.4512	0.3591	0.6744	0.6235	0.6094	0.5712	0.3287	0.2861	0.5182	0.6023
R-squared	0.528	0.545	0.680	0.688	0.683	0.687	0.665	0.670	0.659	0.664	0.413	0.426	0.328	0.334

Table 3.8 (Continued): Instrumental variables regressions between the risk measures and the aggregate measures of social performance

	Panel D: VaR measures							
	avarhs	avarhs	avarrm	avarrm	avargarch	avargarch	avarfhs	avarfhs
SP	-0.5115***		-0.5422***		-0.5811***		-0.4109**	
	(-2.93)		(-2.95)		(-2.84)		(-2.21)	
Str		0.1170		0.3003		0.2977		0.1636
		(0.49)		(1.28)		(1.12)		(0.63)
Con		0.8872***		1.0542***		1.1170***		0.7567***
		(4.95)		(5.38)		(4.98)		(3.95)
lnmkteq	-0.0341***	-0.0536***	-0.0213***	-0.0474***	-0.0369***	-0.0642***	-0.0430***	-0.0610***
	(-4.79)	(-5.63)	(-3.09)	(-5.29)	(-4.36)	(-5.91)	(-5.61)	(-5.65)
bmw	0.1389***	0.1093**	0.0587*	0.0175	0.0707**	0.0282	0.1259***	0.0973**
	(3.40)	(2.58)	(1.80)	(0.52)	(2.01)	(0.77)	(2.87)	(2.15)
netlevw	-0.0185	-0.0278	-0.0726	-0.0830*	-0.0713	-0.0825	0.0237	0.0165
	(-0.41)	(-0.65)	(-1.41)	(-1.75)	(-1.22)	(-1.52)	(0.51)	(0.37)
ret1y	0.1717***	0.1703***	0.1868***	0.1840***	0.2011***	0.1985***	0.0267	0.0243
	(3.76)	(3.73)	(5.65)	(5.62)	(5.68)	(5.66)	(0.65)	(0.59)
avgturnover	20.9659***	21.0664***	17.9592***	18.0364***	18.4662***	18.5479***	23.5312***	23.5721***
	(8.68)	(8.84)	(8.77)	(8.97)	(7.84)	(8.01)	(8.66)	(8.70)
cvturnover	0.0264	0.0243	0.0118	0.0097	0.0344	0.0320	0.0530***	0.0513***
	(1.39)	(1.33)	(0.60)	(0.51)	(1.37)	(1.31)	(2.70)	(2.67)
dispeps1w	-0.1447***	-0.1556***	-0.1795***	-0.1931***	-0.1688***	-0.1832***	-0.1482***	-0.1586***
	(-3.61)	(-3.93)	(-4.28)	(-4.60)	(-3.63)	(-3.97)	(-3.88)	(-4.19)
investment	1.3092***	1.2544***	1.4095***	1.3326***	1.7099***	1.6300***	1.2673***	1.2170***
	(3.00)	(3.08)	(3.14)	(3.26)	(3.19)	(3.31)	(3.14)	(3.22)
expgrthw	0.4489***	0.4214***	0.5102***	0.4773***	0.5528***	0.5189***	0.3453***	0.3194***
	(3.36)	(3.26)	(3.47)	(3.46)	(3.35)	(3.33)	(2.96)	(2.86)
zscorew	0.0005	0.0002	0.0003	0.0001	0.0026	0.0023	0.0022	0.0020
	(0.22)	(0.10)	(0.09)	(0.03)	(0.66)	(0.60)	(0.93)	(0.87)
sdroaw	2.0217***	1.9034***	2.3362***	2.1810***	2.4879***	2.3260***	1.6567***	1.5484***
	(5.45)	(5.09)	(5.04)	(4.75)	(4.98)	(4.69)	(4.98)	(4.60)
inv_basew	-0.0032	-0.0011	-0.0067	-0.0042	-0.0197	-0.0170	-0.0191	-0.0172
	(-0.18)	(-0.06)	(-0.39)	(-0.25)	(-1.01)	(-0.90)	(-1.15)	(-1.07)
Constant	0.5915***	0.7232***	0.5052***	0.6826***	0.7288***	0.9146***	0.7799***	0.9040***
	(7.95)	(8.07)	(6.78)	(8.02)	(7.89)	(8.75)	(9.62)	(9.00)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1935	1935	1935	1935	1932	1932	1922	1922
Number of firms	416	4165	416	416	415	415	411	411
J statistic p-value	0.1366	0.1198	0.4523	0.4280	0.3463	0.3205	0.4832	0.4479
R-squared	0.531	0.542	0.512	0.529	0.485	0.500	0.536	0.545

Note:

Table 3.8 reports results from instrumental variables (IV) regressions of the risk measures on the social performance measures and controls over the period 1991–2007. The risk measures are systematic risk (mbetaw and mbetaffw), idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw), total risk (volatilityw and dvolatilityw), and the annualized 1% VaR (avarhsw, avarrmw, avargarchw and avarfhsw). SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). The explanatory variables are firm size (lnmkteq), the book-to-market ratio (bmw), net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment (sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets), expected growth in earnings (expgrthw), Altman's (1993) distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and investor base (inv_basew). All variables are defined in footnotes of Table 3.1. The IV regressions are estimated using the two-step efficient generalized method of moments (GMM). We use three instruments: lagged SP, the median industry SP and a dummy variable for loss firms (i.e., equals to one for firms with negative free cash flow in the previous year, and zero otherwise). J statistic p-value is the p-value of the Hansen J statistic (overidentification test of all instruments). Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

The findings reported in Table 3.8 are virtually similar to those reported in Table 3.5, except that the coefficient of the aggregate combined measure of social performance (SP) becomes insignificant when the dependent variable is the volatility measured using one-year daily returns. Table 3.8 shows that the aggregate combined measure of social performance (SP) is significantly and negatively related to stock return volatility measured using five-year monthly returns, systematic risk and VaR. The significant and positive relation is identified for the aggregate measure of concerns (Con) with stock return volatility, idiosyncratic risk, systematic risk and VaR. None of the coefficients associated with the aggregate strengths measure (Str) is significant at conventional level. Therefore, we conclude that financial firms with higher concerns scores have higher risk regardless of how risk is measured. Thus, the negative impact of SP on a financial firm's risk is mainly due to concerns suggesting an asymmetric relation between SP and risk.

The results reported in Table 3.9 are virtually similar to those reported in Table 3.6, once again reinforcing our conclusion. Specifically, Corporate Governance is significantly and negatively related to volatility, idiosyncratic risk, systematic risk and VaR. Product is significantly and negatively related to volatility, systematic risk and VaR. Employee relations are significantly and negatively related to stock return volatility measured using five-year monthly returns, and VaR using the Risk Metric model. The other dimensions (i.e., Community, Diversity, Environment, and Human Rights) are not significantly related to a financial firm's risk, except for Diversity which remains significantly and positively related to idiosyncratic risk.

Table 3.9: Instrumental variables regressions between the risk measures and the social performance dimensions

	Total risk		Idiosyncratic risk			Systematic risk	
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	mbetaw	mbetaffw
ave_com	0.0140	-0.0164	-0.0179	-0.0183	-0.0170	-0.0547	0.0167
	(0.53)	(-0.65)	(-0.72)	(-0.71)	(-0.66)	(-0.39)	(0.13)
ave_div	0.0106	0.0298*	0.0389***	0.0399***	0.0387***	-0.0322	-0.0201
	(0.52)	(1.94)	(2.63)	(2.72)	(2.64)	(-0.30)	(-0.21)
ave_emp	-0.0657**	-0.0390*	-0.0329*	-0.0301	-0.0293	-0.1881	-0.2175
	(-2.10)	(-1.87)	(-1.69)	(-1.56)	(-1.52)	(-1.03)	(-1.28)
ave_env	0.0181	-0.0227	0.0382	0.0405	0.0385	-1.1676	-1.5530*
	(0.17)	(-0.15)	(0.28)	(0.30)	(0.29)	(-1.49)	(-1.92)
ave_non	-0.1050	-0.0126	0.0265	0.0264	0.0241	-0.5008	-0.2400
	(-1.53)	(-0.29)	(0.69)	(0.71)	(0.65)	(-1.24)	(-0.78)
ave_pro	-0.0557**	-0.0404*	-0.0219	-0.0251	-0.0261	-0.4504***	-0.2917**
	(-2.47)	(-1.94)	(-1.09)	(-1.26)	(-1.32)	(-3.16)	(-2.28)
ave_oth	-0.0896**	-0.0729***	-0.0727***	-0.0722***	-0.0734***	-0.5730***	-0.4144**
	(-2.34)	(-2.84)	(-3.14)	(-3.12)	(-3.19)	(-2.92)	(-2.17)
lnmkteq	-0.0222***	-0.0206***	-0.0229***	-0.0221***	-0.0225***	-0.0149	0.0392**
	(-5.75)	(-5.38)	(-6.12)	(-6.02)	(-6.07)	(-0.76)	(2.16)
bmw	0.0369**	0.0365***	0.0343***	0.0302**	0.0268**	0.3243***	0.3055***
	(2.49)	(3.00)	(2.88)	(2.56)	(2.25)	(4.00)	(4.05)
netlevw	-0.0251	-0.0011	0.0092	0.0083	0.0078	-0.2437**	-0.1775*
	(-1.15)	(-0.07)	(0.64)	(0.58)	(0.55)	(-2.03)	(-1.66)
ret1y	0.0418***	-0.0353***	-0.0337***	-0.0309***	-0.0285**	0.0720	0.0208
	(3.29)	(-3.12)	(-2.84)	(-2.64)	(-2.43)	(1.23)	(0.35)
avgturnover	9.4184***	9.4145***	9.9301***	9.9349***	9.8504***	26.7104***	18.0746***
	(9.59)	(13.55)	(13.33)	(13.43)	(13.44)	(5.35)	(3.98)
cvturnover	0.0004	0.0406***	0.0535***	0.0548***	0.0547***	-0.0082	-0.0557
	(0.06)	(4.85)	(5.93)	(5.96)	(5.99)	(-0.21)	(-1.38)
dispeps1w	-0.0699***	-0.0118	-0.0089	-0.0083	-0.0123	-0.2676***	-0.1346
	(-3.44)	(-0.73)	(-0.52)	(-0.48)	(-0.71)	(-3.09)	(-1.61)
investment	0.8167***	0.4072***	0.3948***	0.3939***	0.3928***	2.1123*	1.8869*
	(3.44)	(3.07)	(3.19)	(3.26)	(3.29)	(1.68)	(1.87)
expgrthw	0.2218***	0.1232***	0.1151***	0.1233***	0.1248***	0.5054*	0.3345
	(3.72)	(3.16)	(3.23)	(3.42)	(3.43)	(1.87)	(1.45)
zscorew	0.0005	0.0009	0.0010	0.0010	0.0009	-0.0041	-0.0079
	(0.35)	(1.15)	(1.22)	(1.19)	(1.15)	(-0.41)	(-1.01)
sdroaw	0.8293***	0.4493***	0.4155***	0.4095***	0.4092***	3.7908***	2.2751***
	(3.63)	(4.31)	(3.96)	(3.97)	(3.97)	(4.68)	(3.41)
inv_basew	-0.0220***	-0.0133**	-0.0199***	-0.0194***	-0.0189***	-0.0048	-0.0356
	(-2.76)	(-2.35)	(-3.61)	(-3.56)	(-3.46)	(-0.09)	(-0.67)
Constant	0.2970***	0.3765***	0.3202***	0.2934***	0.2887***	0.7205***	0.2467
	(7.67)	(10.08)	(8.88)	(8.33)	(8.12)	(3.71)	(1.37)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1954	1954	1954	1954	1954	1954	1954
Number of firms	428	428	428	428	428	428	428
J statistic p-value	0.7458	0.7167	0.5605	0.6345	0.5537	0.4480	0.2039
R-squared	0.533	0.689	0.690	0.672	0.666	0.424	0.333

Table 3.9 (Continued): Instrumental variables regressions between the risk measures and the social performance dimensions

	Panel D: VaR measures			
	avarhs	**avarrm**	**avargarch**	**avarfhs**
ave_com	0.0167	0.0857	0.0319	0.0132
	(0.25)	(1.24)	(0.41)	(0.19)
ave_div	0.0127	-0.0161	0.0066	0.0109
	(0.29)	(-0.36)	(0.13)	(0.22)
ave_emp	-0.1201*	-0.1586**	-0.1282*	-0.0290
	(-1.87)	(-2.49)	(-1.79)	(-0.46)
ave_env	-0.1263	0.0862	0.2503	-0.3212
	(-0.40)	(0.26)	(0.75)	(-0.89)
ave_non	-0.1459	-0.2099	-0.3095*	-0.0680
	(-1.12)	(-1.35)	(-1.69)	(-0.55)
ave_pro	-0.1668***	-0.1146*	-0.1296**	-0.1551**
	(-2.91)	(-1.89)	(-1.98)	(-2.59)
ave_oth	-0.1663**	-0.2480**	-0.2861**	-0.1661**
	(-2.02)	(-2.41)	(-2.54)	(-2.08)
lnmkteq	-0.0538***	-0.0430***	-0.0624***	-0.0616***
	(-5.01)	(-4.07)	(-4.89)	(-5.33)
bmw	0.0845**	0.0231	0.0389	0.0818**
	(2.31)	(0.71)	(1.09)	(2.33)
netlevw	-0.0171	-0.0857*	-0.0838	0.0266
	(-0.37)	(-1.68)	(-1.44)	(0.55)
ret1y	0.1247***	0.1510***	0.1665***	-0.0151
	(3.34)	(4.79)	(4.88)	(-0.51)
avgturnover	19.1151***	16.6372***	16.8278***	21.6307***
	(8.28)	(7.82)	(6.91)	(8.23)
cvturnover	0.0251	0.0082	0.0311	0.0513***
	(1.32)	(0.40)	(1.21)	(2.62)
dispeps1w	-0.1409***	-0.1736***	-0.1649***	-0.1402***
	(-3.37)	(-3.86)	(-3.30)	(-3.52)
investment	1.2373***	1.3352***	1.6361***	1.2181***
	(2.78)	(3.07)	(3.09)	(2.94)
expgrthw	0.4275***	0.4711***	0.5142***	0.3214***
	(3.27)	(3.42)	(3.29)	(2.87)
zscorew	0.0009	-0.0007	0.0021	0.0029
	(0.39)	(-0.23)	(0.60)	(1.24)
sdroaw	1.8885***	2.2004***	2.3550***	1.5293***
	(5.11)	(4.76)	(4.68)	(4.82)
inv_basew	-0.0032	-0.0078	-0.0232	-0.0206
	(-0.19)	(-0.45)	(-1.20)	(-1.28)
Constant	0.7802***	0.7092***	0.9620***	0.9541***
	(7.62)	(7.08)	(7.87)	(8.64)
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Observations	1921	1921	1919	1909
Number of firms	415	415	414	410
J statistic p-value	0.2347	0.5127	0.4164	0.7045
R-squared	0.537	0.513	0.484	0.552

Note:

Table 3.9 reports results from instrumental variables (IV) regressions of the risk measures on the individual dimensions of SP and controls over the period 1991–2007. The risk measures are systematic risk (mbetaw and mbetaffw), idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw), total risk (volatilityw and dvolatilityw), and the annualized 1% VaR (avarhsw, avarrmw, avargarchw and avarfhsw). The individual dimensions of SP are Community relations (ave_com), Diversity (ave_div), Employee relations (ave_emp), Environmental performance (ave_env), Human Rights (ave_non), Product (ave_pro), and Corporate Governance (ave_oth), respectively. The explanatory variables are firm size (lnmkteq), the book-to-market ratio (bmw), net leverage (nctlevw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment (sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets), expected growth in earnings (expgrthw), Altman's (1993) distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and investor base (inv_basew). All variables are defined in footnotes of Table 3.1. The IV regressions are estimated using the two-step efficient generalized method of moments (GMM). We use three instruments: lagged values of the individual dimensions of SP, the median industry SP and a dummy variable for loss firms (i.e., equals to one for firms with negative free cash flow in the previous year, and zero otherwise). J statistic p-value is the p-value of the Hansen J statistic (overidentification test of all instruments). Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

Table 3.10: Instrumental variables regressions between the risk measures and the strengths and concerns of social performance dimensions

	Total risk		Idiosyncratic risk			Systematic risk	
	Volatilityw	dvolatilityw	sdresCAPMw	sdresffw	sdres4ffw	mbetaw	mbetaffw
avestr_com	-0.0313	-0.0241	-0.0299	-0.0253	-0.0245	-0.4418**	-0.2221
	(-1.02)	(-0.91)	(-1.13)	(-0.96)	(-0.95)	(-2.47)	(-1.29)
avecon_com	-0.0714	0.0421	0.0253	0.0342	0.0308	-0.5546**	-0.5003**
	(-1.62)	(0.98)	(0.60)	(0.79)	(0.71)	(-2.48)	(-2.28)
avestr_div	0.0108	0.0295	0.0417*	0.0392*	0.0398*	-0.0074	-0.1517
	(0.29)	(1.19)	(1.83)	(1.75)	(1.79)	(-0.04)	(-0.83)
avecon_div	-0.0103	-0.0263	-0.0350*	-0.0348*	-0.0316*	0.0166	-0.0886
	(-0.42)	(-1.35)	(-1.91)	(-1.91)	(-1.73)	(0.12)	(-0.66)
avestr_emp	0.0354	-0.0054	-0.0037	-0.0021	-0.0043	0.4276*	0.2536
	(0.90)	(-0.18)	(-0.13)	(-0.08)	(-0.16)	(1.72)	(1.15)
avecon_emp	0.1623***	0.0707**	0.0562*	0.0535*	0.0492*	0.7886***	0.6916**
	(3.09)	(2.30)	(1.89)	(1.84)	(1.69)	(2.79)	(2.58)
avestr_env	-0.1838	-0.2286	-0.1369	-0.1263	-0.1201	-1.3262	-1.5898*
	(-1.45)	(-1.54)	(-0.94)	(-0.89)	(-0.83)	(-1.65)	(-1.93)
avecon_env	-0.1857	-0.1242	-0.1734	-0.1663	-0.1600	1.0090	1.4700
	(-1.47)	(-0.74)	(-1.16)	(-1.13)	(-1.08)	(0.87)	(1.48)
avecon_non	0.1283	0.0231	-0.0302	-0.0356	-0.0344	0.6011	0.2213
	(1.47)	(0.44)	(-0.60)	(-0.72)	(-0.70)	(1.39)	(0.59)
avestr_pro	0.1221*	0.1106*	0.1104**	0.0972*	0.0897*	0.5759	0.5936*
	(1.92)	(1.71)	(2.16)	(1.94)	(1.84)	(1.60)	(1.72)
avecon_pro	0.0869***	0.0602***	0.0413*	0.0447**	0.0446**	0.6355***	0.4729***
	(3.20)	(2.69)	(1.88)	(2.05)	(2.06)	(3.80)	(3.16)
avestr_oth	0.0023	-0.0283	-0.0424	-0.0364	-0.0308	-0.1706	-0.0528
	(0.03)	(-0.60)	(-0.94)	(-0.81)	(-0.69)	(-0.55)	(-0.15)
avecon_oth	0.1555***	0.1108***	0.0974***	0.0988***	0.1011***	0.8627***	0.7048***
	(2.95)	(3.11)	(2.96)	(3.02)	(3.10)	(3.06)	(2.65)
lnmkteq	-0.0281***	-0.0249***	-0.0258***	-0.0252***	-0.0255***	-0.0429**	0.0178
	(-6.50)	(-5.78)	(-6.33)	(-6.29)	(-6.30)	(-2.01)	(0.89)
bmw	0.0329**	0.0321***	0.0313***	0.0273**	0.0240**	0.3145***	0.3058***
	(2.24)	(2.59)	(2.59)	(2.29)	(2.01)	(3.89)	(4.00)
netlevw	-0.0315	-0.0077	0.0033	0.0048	0.0041	-0.2856***	-0.1831*
	(-1.53)	(-0.54)	(0.26)	(0.39)	(0.34)	(-2.65)	(-1.88)
ret1y	0.0409***	-0.0340***	-0.0307***	-0.0296***	-0.0271**	0.0672	0.0215
	(3.29)	(-3.01)	(-2.65)	(-2.62)	(-2.39)	(1.19)	(0.37)
avgturnover	9.3805***	9.4079***	9.9732***	9.9302***	9.8637***	26.6657***	17.8726***
	(9.59)	(13.84)	(13.60)	(13.62)	(13.62)	(5.43)	(3.93)
cvturnover	-0.0011	0.0395***	0.0521***	0.0544***	0.0543***	-0.0198	-0.0671*
	(-0.17)	(4.77)	(5.86)	(6.00)	(6.02)	(-0.50)	(-1.66)
dispeps1w	-0.0746***	-0.0179	-0.0132	-0.0120	-0.0155	-0.2792***	-0.1391*
	(-3.61)	(-1.12)	(-0.75)	(-0.68)	(-0.88)	(-3.17)	(-1.66)
investment	0.7821***	0.3860***	0.3752***	0.3754***	0.3767***	1.9715*	1.8107*
	(3.71)	(3.31)	(3.29)	(3.40)	(3.46)	(1.74)	(1.91)
expgrthw	0.2092***	0.1205***	0.1128***	0.1184***	0.1190***	0.4462*	0.2818
	(3.76)	(3.29)	(3.32)	(3.47)	(3.46)	(1.81)	(1.30)
zscorew	0.0003	0.0006	0.0008	0.0009	0.0008	-0.0065	-0.0078
	(0.21)	(0.87)	(1.05)	(1.21)	(1.16)	(-0.66)	(-1.00)
sdroaw	0.7451***	0.3982***	0.3762***	0.3686***	0.3634***	3.2718***	1.8834***
	(3.49)	(3.97)	(3.79)	(3.79)	(3.72)	(4.26)	(2.88)
inv_basew	-0.0218***	-0.0144**	-0.0212***	-0.0202***	-0.0196***	-0.0065	-0.0285
	(-2.79)	(-2.39)	(-3.67)	(-3.54)	(-3.45)	(-0.13)	(-0.58)
Constant	0.3351***	0.4057***	0.3405***	0.3137***	0.3074***	0.9155***	0.4063**
	(8.14)	(9.93)	(8.85)	(8.28)	(8.05)	(4.37)	(2.06)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1954	1954	1954	1954	1954	1954	1954
Number of firms	428	428	428	428	428	428	428
J statistic p-value	0.9572	0.7845	0.7487	0.9623	0.8579	0.8123	0.1314
R-squared	0.546	0.699	0.696	0.680	0.673	0.444	0.347

Table 3.10 (Continued): Instrumental variables regressions between the risk measures and the strengths and concerns of social performance dimensions

	Panel D: VaR measures			
	avarhs	**avarrm**	**avargarch**	**avarfhs**
avestr_com	-0.0409	-0.0031	-0.0459	-0.0476
	(-0.57)	(-0.04)	(-0.56)	(-0.60)
avecon_com	-0.0733	-0.1835*	-0.0924	-0.0411
	(-0.66)	(-1.86)	(-0.73)	(-0.37)
avestr_div	-0.0200	-0.0478	-0.0312	0.0333
	(-0.27)	(-0.65)	(-0.38)	(0.42)
avecon_div	-0.0163	0.0064	-0.0113	0.0141
	(-0.28)	(0.11)	(-0.17)	(0.22)
avestr_emp	-0.0338	0.0220	0.0267	-0.0459
	(-0.41)	(0.24)	(0.26)	(-0.50)
avecon_emp	0.2133**	0.3576***	0.3006**	0.0195
	(2.14)	(3.27)	(2.46)	(0.21)
avestr_env	-0.5473	-0.0836	-0.1221	-0.8113**
	(-1.42)	(-0.18)	(-0.26)	(-2.07)
avecon_env	-0.2261	-0.0788	-0.4323	-0.2136
	(-0.37)	(-0.11)	(-0.63)	(-0.32)
avecon_non	0.1049	0.2269	0.3644	0.0453
	(0.64)	(1.12)	(1.54)	(0.33)
avestr_pro	0.3131**	0.4395**	0.4562**	0.2635
	(2.03)	(2.48)	(2.35)	(1.48)
avecon_pro	0.2471***	0.2025***	0.2199***	0.2171***
	(3.55)	(2.87)	(2.91)	(3.15)
avestr_oth	-0.0415	-0.0834	-0.1398	0.0026
	(-0.33)	(-0.60)	(-0.84)	(0.02)
avecon_oth	0.2880**	0.3926***	0.4216***	0.2850**
	(2.53)	(2.77)	(2.73)	(2.40)
lnmkteq	-0.0641***	-0.0568***	-0.0764***	-0.0707***
	(-5.36)	(-4.75)	(-5.37)	(-5.48)
bmw	0.0773**	0.0126	0.0285	0.0810**
	(2.08)	(0.39)	(0.80)	(2.26)
netlevw	-0.0311	-0.0995**	-0.1015**	0.0123
	(-0.74)	(-2.28)	(-1.99)	(0.28)
ret1y	0.1220***	0.1470***	0.1620***	-0.0146
	(3.33)	(4.69)	(4.75)	(-0.49)
avgturnover	19.0681***	16.5544***	16.7391***	21.6627***
	(8.35)	(7.69)	(6.80)	(8.39)
cvturnover	0.0227	0.0059	0.0286	0.0455**
	(1.19)	(0.30)	(1.13)	(2.39)
dispeps1w	-0.1504***	-0.1852***	-0.1798***	-0.1473***
	(-3.60)	(-4.00)	(-3.50)	(-3.67)
investment	1.1692***	1.2596***	1.5576***	1.1832***
	(2.92)	(3.37)	(3.31)	(3.14)
expgrthw	0.4149***	0.4456***	0.4869***	0.3034***
	(3.31)	(3.49)	(3.34)	(2.87)
zscorew	0.0008	-0.0010	0.0017	0.0028
	(0.36)	(-0.37)	(0.49)	(1.34)
sdroaw	1.7170***	1.9552***	2.1054***	1.3959***
	(4.73)	(4.42)	(4.32)	(4.41)
inv_basew	-0.0062	-0.0084	-0.0250	-0.0240
	(-0.33)	(-0.43)	(-1.15)	(-1.35)
Constant	0.8561***	0.8035***	1.0606***	1.0199***
	(7.71)	(7.30)	(7.97)	(8.56)
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Observations	1921	1921	1919	1909
Number of firms	415	415	414	410
J statistic p-value	0.4456	0.8490	0.6795	0.9094
R-squared	0.547	0.529	0.498	0.561

Note:

Table 3.10 reports results from instrumental variables (IV) regressions of the risk measures on the strengths and concerns of the individual dimensions of SP and controls over the period 1991–2007. The risk measures are systematic risk (mbetaw and mbetaffw), idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw), total risk (volatilityw and dvolatilityw), and the annualized 1% VaR (avarhsw, avarrmw, avargarchw and avarfhsw). The strengths and concerns of the individual dimensions of SP are Community strengths (avestr_com), Community concerns (avecon_com), Diversity strengths (avestr_div), Diversity concerns (avecon_div), Employee strengths (avestr_emp), Employee concerns (avecon_cmp), Environment strengths (avestr_env), Environment concerns (avecon_env), Human Rights concerns (avecon_non), Product strengths (avestr_pro), Product concerns (avecon_pro), Corporate Governance strengths (avestr_oth), and Corporate Governance concerns (avecon_oth), respectively. Human Rights strengths (avestr_non) are excluded. The explanatory variables are firm size (lnmkteq), the book-to-market ratio (bmw), net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment (sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets), expected growth in earnings (expgrthw), Altman's (1993) distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and investor base (inv_basew). All variables are defined in footnotes of Table 3.1. The IV regressions are estimated using the two-step efficient generalized method of moments (GMM). We use three instruments: lagged values of the strengths and concerns of the individual dimensions of SP, the median industry SP and a dummy variable for loss firms (i.e., equals to one for firms with negative free cash flow in the previous year, and zero otherwise). J statistic p-value is the p-value of the Hansen J statistic (overidentification test of all instruments). Unreported industry controls are based on the Fama and French (1997) industry classification. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

Except for Community concerns which now become significantly and negatively related to systematic risk, which is contrary to our expectations, the results reported in Table 3.10 are similar to those reported in Table 3.7. In particular, the impact on the firm's risk of Employee relations, Product and Corporate Governance remains after controlling for endogeneity. Employee, Product and Corporate Governance concerns remain significantly and positively related to total risk, idiosyncratic risk, systematic risk, and the VaR in all specifications. Note that the relation between Employee concerns and idiosyncratic risk now becomes marginally significant (at 10% level). Product strengths are significantly and positively related to the VaR.

We refine our conclusion about the impact of strengths and concerns of SP dimensions separately after correcting for endogeneity as follow. First, Employee, Product and Corporate Governance concerns positively affect total risk, idiosyncratic risk, systematic risk, and the Value at Risk (VaR). Second, Product strengths positively affect the VaR. Third, the other SP dimensions (i.e., Community, Diversity, Environment, and Human Rights) have no systematically significant impact on total risk or the VaR measures.

3.5.5.2. Regressions by industry: banks, insurance and trading firms

Table 3.11 reports the results of the regressions between the risk measures and the aggregate measures of social performance for banks, insurance and trading firms.[85] The result shows that social performance affects the risk of banks and trading firms, but not insurance firms. For trading firms, the aggregate combined measure of social performance (SP) is significantly and negatively related to volatility, systematic risk and VaR. The aggregate measure of concerns (Con) is significantly and positively related to volatility, idiosyncratic risk, systematic risk and VaR. None of the coefficients associated with the aggregate strengths measure (Str) is significant. Thus, social performance in aggregate is negatively related to a trading firm's risk mainly due to concerns. For banks, none of the coefficients associated with the aggregate combined measure of social performance (SP) is significant. However, the aggregate measure of concerns (Con) is significantly and positively related to volatility, idiosyncratic risk and VaR. The aggregate strengths measure (Str) is also significantly and positively related to volatility and idiosyncratic risk. Thus, both aggregate strengths and concerns positively affect a bank's risk.

[85] We can not examine Real Estate because there are only 40 firm-year observations, as noted earlier.

Table 3.11: Relation between the risk measures and the aggregate measures of social performance by industry

	Panel A: Total risk measures				Panel B: Idiosyncratic risk measures						Panel C: Systematic risk measures			
	Volatilityw	Volatilityw	dvolatilityw	dvolatilityw	sdresCAPMw	sdresCAPMw	sdresffw	sdresffw	sdres4ffw	sdres4ffw	mbetaw	mbetaw	mbetaffw	mbetaffw
Banking														
SP	-0.0622		-0.0486		-0.0318		-0.0334		-0.0400		-0.5192		-0.6031*	
	(-1.17)		(-0.97)		(-0.78)		(-0.87)		(-1.03)		(-1.62)		(-1.88)	
Str		0.0049		0.2096***		0.1672***		0.1576***		0.1579***		-0.2191		-0.5847
		(0.06)		(3.27)		(3.09)		(3.12)		(3.09)		(-0.53)		(-1.30)
Con		0.1137*		0.2491***		0.1867***		0.1820***		0.1938***		0.7505*		0.6148
		(1.83)		(4.95)		(4.71)		(4.78)		(5.01)		(1.66)		(1.58)
Observations	1608	1608	1628	1628	1628	1628	1628	1628	1628	1628	1608	1608	1608	1608
R-squared	0.533	0.534	0.653	0.668	0.664	0.674	0.647	0.658	0.631	0.643	0.548	0.549	0.520	0.520
Insurance														
SP	-0.0616		-0.0508		-0.0760		-0.0805		-0.0785		-0.3580		-0.4670	
	(-0.82)		(-0.66)		(-0.94)		(-0.97)		(-0.95)		(-0.92)		(-1.35)	
Str		0.0122		-0.0091		-0.0061		-0.0007		0.0043		-0.5022		-0.5166
		(0.14)		(-0.09)		(-0.06)		(-0.01)		(0.04)		(-0.98)		(-1.02)
Con		0.1099		0.0777		0.1219		0.1332		0.1334		0.2416		0.4208
		(1.18)		(0.78)		(1.18)		(1.27)		(1.27)		(0.51)		(1.00)
Observations	872	872	886	886	886	886	886	886	886	886	872	872	872	872
R-squared	0.582	0.583	0.689	0.690	0.704	0.704	0.690	0.691	0.685	0.686	0.379	0.379	0.327	0.327
Trading														
SP	-0.4533***		-0.2749***		-0.1619*		-0.1567*		-0.1558*		-2.3314***		-1.1246*	
	(-3.15)		(-2.93)		(-1.96)		(-1.93)		(-1.94)		(-3.21)		(-1.68)	
Str		0.0980		0.0715		-0.0003		0.0067		0.0035		1.0136		0.9734
		(0.45)		(0.43)		(-0.00)		(0.05)		(0.02)		(0.94)		(1.00)
Con		0.5898***		0.3592***		0.2004**		0.1957**		0.1937**		3.1603***		1.6472**
		(4.31)		(4.09)		(2.57)		(2.54)		(2.55)		(4.46)		(2.41)
Observations	747	747	766	766	766	766	766	766	766	766	747	747	747	747
R-squared	0.566	0.580	0.637	0.645	0.616	0.618	0.609	0.611	0.607	0.610	0.497	0.513	0.390	0.400
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3.11 (Continued): Relation between the risk measures and the aggregate measures of social performance by industry

	Panel D: VaR measures							
	avarhs	avarhs	avarrm	avarrm	avargarch	avargarch	avarfhs	avarfhs
Banking								
SP	-0.1395		-0.1082		-0.2094		-0.1640	
	(-1.12)		(-0.84)		(-1.29)		(-1.28)	
Str		0.2985*		0.2837*		0.3012		0.4311**
		(1.82)		(1.89)		(1.40)		(2.34)
Con		0.4713***		0.4072**		0.5925***		0.6115***
		(3.38)		(2.55)		(2.94)		(4.54)
Observations	1571	1571	1571	1571	1546	1546	1544	1544
R-squared	0.540	0.548	0.477	0.484	0.299	0.304	0.484	0.496
Insurance								
SP	-0.3135		-0.1325		-0.1627		-0.2429	
	(-1.40)		(-0.80)		(-0.66)		(-1.15)	
Str		0.0009		-0.0026		-0.0509		0.1128
		(0.00)		(-0.01)		(-0.17)		(0.34)
Con		0.5149*		0.2181		0.2315		0.4780*
		(1.75)		(0.95)		(0.60)		(1.68)
Observations	841	841	841	841	837	837	829	829
R-squared	0.599	0.601	0.587	0.587	0.343	0.343	0.609	0.611
Trading								
SP	-0.6060**		-1.0641***		-1.1166***		-0.4253	
	(-2.20)		(-3.38)		(-3.23)		(-1.61)	
Str		0.3655		0.3625		0.4029		0.5171
		(0.93)		(0.77)		(0.78)		(1.25)
Con		0.8495***		1.4280***		1.5034***		0.6599**
		(3.09)		(4.55)		(4.40)		(2.56)
Observations	698	698	698	698	698	698	695	695
R-squared	0.572	0.583	0.571	0.587	0.570	0.585	0.571	0.584
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note:

Table 3.11 reports results from OLS regressions of the risk measures on the social performance measures and controls over the period 1991–2007 for three industries: Banking, Insurance and Trading. The risk measures are systematic risk (mbetaw and mbetaffw), idiosyncratic risk (sdresCAPMw, sdresffw and sdres4ffw), total risk (volatilityw and dvolatilityw), and the annualized 1% VaR (avarhsw, avarrmw, avargarchw and avarfhsw). SP is the aggregate (composite) measure of social performance, which combine strengths and concerns. Str (Con) is the aggregate measure of strengths (concerns). The explanatory variables are firm size (lnmkteq), the book-to-market ratio (bmw), net leverage (netlevw), the annualized return from the previous year's daily stock returns (ret1y), the level of liquidity (avgturnover), the liquidity risk (cvturnover), dispersion of analyst forecasts (dispeps1w), investment (sum of capital expenditures, R&D expenditures, and advertising expenses, divided by total assets), expected growth in earnings (expgrthw), Altman's (1993) distress risk measure (zscorew), the standard deviation of return on assets (sdroa5yw), and investor base (inv_basew). All variables are defined in footnotes of Table 3.1. Robust and clustered (by firm) t-Statistics are reported in parentheses.

*** Significant at the 1% level ($p<0.01$); ** Significant at the 5% level ($p<0.05$); * Significant at the 10% level ($p<0.1$).

3.5.5.3. Alternative Model Specifications

We perform additional robustness checks in order to examine the sensitivity of our results to alternative model specifications. First, the Altman (1993) distress risk measure (zscorew) can be criticized by arguing that this measure is designed primarily for industrial firms and not for financial firms. Therefore, we use investment grade rating (i.e., S&P long-term debt rating) as an alternative proxy for default risk instead of the Zscore. Investment grade rating is computed as a dummy variable equal to one if the S&P debt rating is BB+ or less (i.e., junk bonds) and equal to zero otherwise (i.e., investment grade debt). Investment grade is expected to be positively related to the risk measures. Second, we use the Amihud illiquidity measure as an alternative measure of the level of liquidity. The illiquidity measure is computed as in Amihud (2002). Third, we use the cross-sectional standard deviation of the long-term growth in earnings forecasts (displtg) from I/B/E/S as an alternative measure of the dispersion of analyst forecasts instead of the cross-sectional standard deviation of the one-year-ahead earnings forecasts (dispeps1w). Fourth, we include in our regressions the percentage absolute forecast error as an additional measure of cash flow risk. Forecast error is measured as the difference between the one-year ahead median earnings forecast and the actual earnings divided by the stock price. Finally, we also include in our regressions the free cash flow to equity (or to the firm) to control for profitability.[86] Overall, the untabulated results from these alternative model specifications are not materially different from those reported in this paper and our main conclusion remains unchanged. [87]

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[86] The free cash flow to equity is measured as net income plus depreciation minus capital expenditures minus changes in non cash working capital minus net debt issues minus preferred dividends. The free cash flow to the firm is measured as EBIT minus tax paid plus depreciation minus capital expenditures minus changes in non cash working capital.

[87] Results are available from the authors upon request.

3.6. Conclusion

This paper examines the impact of social performance (SP) on a financial firm's risk. We use various measures of SP and four market-based measures of risk: total, idiosyncratic, systematic and Value at Risk (VaR). We examine this impact using a sample of 4132 financial firm-year observations covering the time period from 1991 to 2007 and employing alternative estimation methodologies.

Several important conclusions can be drawn from our analysis. First, the aggregate combined measure of SP is significantly and negatively related to stock return volatility, systematic risk and VaR. The aggregate measure of concerns is significantly and positively related to all risk measures. Therefore, we conclude that financial firms with higher concerns scores have higher risk regardless of how risk is measured. Thus, the negative impact of SP on a financial firm's risk is mainly due to concerns suggesting an asymmetric relation between SP and risk.

Second, only some SP dimensions significantly affect a financial firm's risk. In particular, Employee relations, Product and Corporate Governance significantly and negatively affect a financial firm's risk as measured by stock return volatility and VaR. Moreover, Corporate Governance is negatively related to idiosyncratic and systematic risks, and Product is negatively related to systematic risk. Third, Employee, Product and Corporate Governance concerns positively affect total risk, idiosyncratic risk, systematic risk, and the Value at Risk (VaR), whereas Product strengths positively affect the VaR.

Fourth, additional analysis by subsamples shows that social performance affects the risk of banks and trading firms, but not insurance firms. In particular, social performance in the aggregate is negatively related to a trading firm's risk mainly due to concerns. For banks, the aggregate measure of concerns is significantly and positively related to volatility, idiosyncratic risk and VaR. The aggregate strengths measure is also significantly and positively related to volatility and idiosyncratic risk. Thus, both aggregate strengths and concerns positively affect a bank's risk.

Our findings regarding the positive impact on a financial firm's risk of Employee, Product and Corporate Governance concerns are consistent with the stakeholder theory and its risk management argument of social risks, the Merton (1987) argument on investor recognition or the size of a firm's investor base, and models of investor preferences (e.g., Heinkel *et al.,* 2001; Barnea *et al.,* 2005; Mackey *et al.,* 2007). They are also consistent with the results of previous studies (e.g., Frooman, 1997; Godfrey *et al.,* 2009; Oikonomou *et al.*, 2012; Goss and Roberts, 2011) suggesting that the impact of concerns on firm risk is more important than the impact of strengths. As argued by some authors (e.g., Lankoski, 2009), avoiding or reducing concerns and not undertaking or having strengths seem to be of higher priority for stakeholders. Thus, concerns are weighted more heavily than strengths by investors.

Our findings regarding the positive impact on a financial firm's risk of Product strengths might be explained by the managerial opportunism hypothesis which draws on agency theory and suggests that managers make over-investment in SP (i.e., undertaking strengths) for their private benefit (i.e., to improve their own reputation and job security), even at the expense of shareholders (Barnea and Rubin, 2010; Cespa and Cestone, 2007). This agency costs can be viewed as a costly diversion of scarce resources, which increases risk. Another potential explanation is that the stock market does not fully value intangibles (e.g., Edmans, 2011).

Our results could be interesting at several levels. For investors and financial analysts, our results suggest that concerns should be included as significant extra financial risk in the evaluation of a bank or trading firm. Our results could also help regulators in their role as monitors of financial institutions. While regulators recognize that corporate governance issues are important,[88] our findings suggest three additional issues for future research. First, it would be interesting to examine whether our results hold outside the U.S. context examined herein. Second, the recent financial crisis offers an opportunity to examine whether there is a systematic variation in the impact of SP on financial firm's risk between the pre-crisis and post-crisis periods. Finally, it would be interesting to investigate the impact of SP on other important risk sources for financial firms such as credit risk and operational risk.

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[88] Chen *et al.,* (2006) find that stock option-based executive compensation induces risk-taking in the banking industry.

APPENDIX 3.1

MSCI ESG STATS (KLD)'S STRENGTH AND CONCERN RATINGS

Appendix 3.1: MSCI ESG STATS (KLD)'s Strength and Concern Ratings

Dimension	Strengths	Concerns
Community	- Charitable Giving - Innovative Giving - Non-US Charitable Giving - Support for Housing - Support for Education - Indigenous Peoples Relations - Volunteer Programs - Other Strength	- Investment Controversies - Negative Economic Impact - Indigenous Peoples Relations - Tax Disputes - Other Concern
Diversity	- CEO's identity - Promotion - Board of Directors - Work/Life Benefits - Women & Minority Contracting - Employment of the Disabled - Gay & Lesbian Policies - Other Strength	- Controversies (e.g., fines) - Non-Representation - Other Concern
Employee Relations	- Union Relations - No-Layoff Policy - Cash Profit Sharing - Employee Involvement - Retirement Benefits Strength - Health and Safety Strength - Other Strength	- Union Relations - Health and Safety Concern - Workforce Reductions - Retirement Benefits Concern - Other Concern
Environment	- Beneficial Products and Services - Pollution Prevention - Recycling - Clean Energy - Communications - Property, Plant, and Equipment - Management Systems - Other Strength	- Hazardous Waste - Regulatory Problems - Ozone Depleting Chemicals - Substantial Emissions - Agricultural Chemicals - Climate Change - Other Concern
Product	- Quality - R&D/Innovation - Benefits to Economically Disadvantaged - Other Strength	- Product Safety - Marketing/Contracting Concern - Antitrust - Other Concern
Human Rights	- Positive Record in South Africa (1994-1995) - Indigenous Peoples Relations Strength - Labor Rights Strength - Other Strength	- South Africa (1991-1994) - Northern Ireland (1991-1994) - Burma Concern - Mexico (1995-2002) - Labor Rights Concern - Indigenous Peoples Relations Concern - Other Concern
Corporate Governance	- Limited Compensation - Ownership Strength - Transparency Strength - Political Accountability Strength - Other Strength	- High Compensation - Ownership Concern - Accounting Concern - Political Accountability Concern - Transparency Concern - Other Concern

APPENDIX 3.2

CALCULATION OF VALUE AT RISK (VAR)

Appendix 3.2 : Calculation of Value at Risk (VaR)

In this appendix, the four methods used to calculate the VaR are described.

3.2.1. Historical simulation (HS)

Consider a sequence of m daily past returns of security i noted as $\{R_{i,t+1-\tau}\}_{\tau=1}^{m}$. The HS technique assumes that the distribution of tomorrow's security returns, $R_{i,t+1}$, is well approximated by the empirical distribution of the past m observations $\{R_{i,t+1-\tau}\}_{\tau=1}^{m}$. That is, the distribution of $R_{i,t+1}$ is captured by the histogram of $\{R_{i,t+1-\tau}\}_{\tau=1}^{m}$. To compute the daily value at risk (VaR) with coverage rate, 1%, we sort the returns in $\{R_{i,t+1-\tau}\}_{\tau=1}^{m}$ in ascending order and choose the $VaR_{t+1}^{0.01}$ to be the number such that only 1% of the observations are smaller than the $VaR_{t+1}^{0.01}$. The 1-day 1% VaR is calculated as the 0.01^{th} percentile of the sequence of past returns:

$$VaR\_HS_{t+1}^{0.01} = -Percentile\left(\{R_{i,t+1-\tau}\}_{\tau=1}^{m}, 0.01\right)$$

Linear interpolation is used to calculate the exact number as the VaR typically falls in between two observations. We choose m = 504 which corresponds to approximately two years of daily past returns.

3.2.2. RiskMetrics (RM) model

Assuming that the mean value of daily returns of security i, $R_{i,t+1}$, is zero and that the innovations (i.e., news hitting return), z_{t+1}, are independently and identically normally distributed with mean equal to zero and variance equal to 1, we can write the daily return as:

$$R_{i,t+1} = \sigma_{i,t+1} z_{t+1}, \qquad \text{with } z_{t+1} \longrightarrow i.i.d.N(0,1)$$

Given these assumptions, we can know the entire distribution of tomorrow's return, $R_{i,t+1}$, if we establish a model for forecasting tomorrow's variance, $\sigma_{i,t+1}^2$. JP Morgan's RiskMetrics

system for market risk management has proposed a conditional variance model where weights on past squared returns decline exponentially as we move backward in time. The RiskMetrics variance model, also called the exponential smoothing variance model, is written as:

$$\sigma^2_{i,t+1} = \lambda\sigma^2_{i,t} + (1-\lambda)R^2_{i,t}, \qquad \text{where } \lambda = 0.94$$

The forecast of tomorrow's variance, $\sigma^2_{i,t+1}$, can be calculated at the end of today when the daily return is realized. The 1-day 1% VaR is calculated as:

$$VaR\_RM^{0.01}_{t+1} = -\sigma_{i,t+1} \times \Phi^{-1}_{0.01}$$

where $\Phi^{-1}_{0.01} = \Phi^{-1}(0.01) = -2.33$, which is the 1% quantile from the standard normal distribution. We use a moving window sample of m daily past returns, $\{R_{i,t+1-\tau}\}^m_{\tau=1}$, in order to compute the RiskMetrics conditional variances for any given year. The first observation is set equal to the unconditional variance computed over the sequence of m daily past returns. We choose m = 504 which corresponds to approximately two years of daily past returns.

3.2.3. GARCH(1,1) - t(d) model

Consider the following $GARCH(1,1) - \tilde{t}(d)$ model with leverage:

$$R_{i,t+1} = \sigma_{i,t+1} z_{t+1}, \qquad \text{with } z_{t+1} \longrightarrow \tilde{t}(d)$$
$$\sigma^2_{i,t+1} = \omega + \alpha\left(R_{i,t} - \theta\sigma_{i,t}\right)^2 + \beta\sigma^2_{i,t}$$

The innovations z_{t+1} follow the standardized $t(d)$ distribution, noted as $\tilde{t}(d)$, which has only one parameter, d. The $\tilde{t}(d)$ density function is given by the following formula:

$$f_{t(d)}(z;d) = \frac{\Gamma\left((d+1)/2\right)}{\Gamma(d/2)\sqrt{\pi(d-2)}}\left(1 + z^2/(d-2)\right)^{-(1+d)/2}, \qquad \text{where } d > 2$$

where $\Gamma(*)$ represents the gamma function. We estimate all the parameters, $\{\omega, \alpha, \beta, \theta, d\}$, simultaneously using maximum likelihood estimation (MLE). We use a moving sample of m daily past returns, $\{R_{i,t+1-\tau}\}_{\tau=1}^{m}$, in order to estimate the parameters and compute the daily conditional variances for any given year. The first observation is set equal to the unconditional variance computed over the sequence of m daily past returns. We choose m = 504 which corresponds to approximately two years of daily past returns. The 1-day 1% VaR is calculated as:

$$VaR_{t+1}^{0.01} = -\sigma_{i,t+1} \times \tilde{t}_{0.01}^{-1}(d)$$

where $\tilde{t}_{0.01}^{-1}(d)$ is the 1% quantile of the $\tilde{t}(d)$ distribution, which is equal to the quantile of the conventional student's $t(d)$ multiplied by $\sqrt{(d-2)/d}$. Thus, we have:

$$VaR\_GARCH_{t+1}^{0.01} = -\sigma_{i,t+1} \times \left(\sqrt{\frac{d-2}{d}}\right) \times t_{0.01}^{-1}(d)$$

where $t_{0.01}^{-1}(d)$ is the 1% quantile of the conventional student's $t(d)$ distribution.

3.2.4. Filtered historical simulation (FHS)

The FHS method combines a conditional variance model with a historical simulation method for the standardized returns. Consider again the $GARCH(1,1) - \tilde{t}(d)$ model with leverage:

$$R_{i,t+1} = \sigma_{i,t+1} z_{t+1}, \qquad \text{with } z_{t+1} \longrightarrow \tilde{t}(d)$$

$$\sigma_{i,t+1}^2 = \omega + \alpha\left(R_{i,t} - \theta\sigma_{i,t}\right)^2 + \beta\sigma_{i,t}^2$$

For any given year, we estimate the parameters of the GARCH model using the sequence of m daily past returns of security i, $\{R_{i,t+1-\tau}\}_{\tau=1}^{m}$. We then calculate standardized returns from the observed returns and from the standard deviations estimated using the GARCH model as follows:

$$\hat{z}_{i,t+1-\tau} = R_{i,t+1-\tau} / \sigma_{i,t+1-\tau}, \qquad \text{for } \tau = 1,2,\ldots\ldots,m$$

We refer to the set of standardized returns as $\left\{\hat{z}_{i,t+1-\tau}\right\}_{\tau=1}^{m}$. At the end of day t we obtain $R_{i,t}$ which allow us to calculate the day $t+1$'s variance, $\sigma_{i,t+1}^2$, in the GARCH model. Since the variance is known, we calculate the 1-day 1% VaR using the percentile of the set of the standardized residuals as follows:

$$VaR\_FHS_{t+1}^{0.01} = -\sigma_{i,t+1} Percentile\left\{\left\{\hat{z}_{i,t+1-\tau}\right\}_{\tau=1}^{m}, 0.01\right\}$$

We choose m = 504 which corresponds to approximately two years of daily past returns.

REFERENCES

Altman, E. (1993). *Corporate financial distress and bankruptcy*. John Wiley and Sons, New York.

Amihud, Y. (2002), « Illiquidity and stock returns: cross-section and time-series effects», *Journal of Financial Markets*, 5, 31-56.

Ang, A., Chen, J., and Xing, Y. (2006), «Downside risk», *Review of Financial Studies*, 19, 1191-1239.

Barnea, A., and Rubin, A. (2010), «Corporate social responsibility as a conflict between shareholders», *Journal of Business Ethics*, 97, 71–86.

Barnea, A., Heinkel. R., and Kraus, A. (2005), «Green investors and corporate investment», *Structural Change and Economic Dynamics*, 16, 332–346.

Baron, D., Harjoto, M., and Jo, H. (2011), «The economics and politics of corporate social performance», *Business and Politics*, 13, 1–46.

Bates, T. W., Kahle, K. M., and Stulz, R. (2009), « Why Do U.S. Firms Hold So Much More Cash than They Used To? », *Journal of Finance*, 64, 1985–2021.

Berk, J., Green, R. C., and Naik, V. (1999), « Optimal investment, growth options, and security returns », *Journal of Finance*, 54, 1553–1607.

Berkowitz, J., and O'Brien, J. (2002), « How Accurate Are Value-at-Risk Models at Commercial Banks? », *Journal of Finance*, 3, 1093-1111.

Botosan, C. A., and Plumlee, M. A. (2005), «Assessing Alternative Proxies for the Expected Risk Premium», *The Accounting Review*, 80, 21-53.

Boutin-Dufresne, F. and Savaria, P. (2004), « Corporate Social Responsibility and Financial Risk», *Journal of Investing*, 13, 57-66.

Brennan, M. J., Chordia, T., and Subrahmanyam, A. (1998), « Alternative factor specifications, security characteristics, and the cross-section of expected stock returns», *Journal of Financial Economics*, 49, 345-373.

Carhart, M. M. (1997), «On Persistence in Mutual Fund Performance», *Journal of Finance*, 52, 57-82.

Carlson, M., Fisher, A., and Giammarino, R. (2004), « Corporate investment and asset price dynamics: Implications for the cross-section of returns », *Journal of Finance*, 59, 2577–2603.

Carlson, M., Fisher, A., and Giammarino, R. (2006), « Corporate Investment and Asset Price Dynamics: Implications for SEO Event Studies and Long-Run Performance », *Journal of Finance*, 61, 1009-1034.

Carroll, A. B. (1979), «A three-dimensional conceptual model of corporate performance», *The Academy of Management Review*, 4, 497-505.

Cespa, G., and Cestone, G. (2007), «Corporate social responsibility and managerial entrenchment», *Journal of Economics and Management Strategy,* 16, 741-771.

Chen, C. R., Steiner, T. L., and Whyte, A. M. (2006), «Does stock option-based executive compensation induce risk-taking? An analysis of the banking industry», *Journal of Banking and Finance*, 30, 915–945.

Chordia, T., Subrahmanyam, A., and Anshuman, R. (2001), «Trading activity and expected stock returns», *Journal of Financial Economics*, 59, 3-32.

Choudhry, M. 2006. *An introduction to value at risk*. John Wiley & Sons Ltd, England.

Christoffersen, P. F. 2003. *Elements of financial risk management*. Academic Press, Elsevier Science, California, USA.

Diamond, D. W., and Rajan, R. G. (2000), «A Theory of Bank Capital», *Journal of Finance*, 55, 2431-2465.

Donaldson, T., and Preston, L. E. (1995), «The stakeholder theory of the corporation: Concepts, evidence, and implications», *Academy of Management Review*, *20*, 65-91.

Edmans, A. (2011). «Does the stock market fully value intangibles? Employee satisfaction and equity prices», *Journal of Financial Economics*, in press. doi:10.1016/j.jfineco.2011.03.021.

El Ghoul, S., Guedhami, O., Kwok, C., and Mishra, D. (2011), «Does corporate social responsibility affect the cost of capital? », *Journal of Banking and Finance*, in press. doi:10.1016/j.jbankfin.2011.02.007.

Fama, E. F., and French, K. R. (1992), « The Cross-Section of Expected Stock Returns », *Journal of Finance*, 47, 427-465.

Fama, E. F., and French, K. R. (1993), « Common Risk Factors in the Returns on Stocks and Bonds », *Journal of Financial Economics*, 33, 3-56.

Fama, E. F., and French. K. R. (1997), « Industry cost of equity », *Journal of Financial Economics*, 43, 153-193.

Feldman, J., Soyka, P., and Ameer, P. (1997), «Does improving a firm's environmental management system and environmental performance result in a higher stock price? », *Journal of Investing*, 6, 87-97.

Freeman, R. E. 1984. *Strategic management: A stakeholder approach*. Boston: Pitman/Ballinger.

Frooman, J. (1997), «Socially irresponsible and illegal behavior and shareholder wealth: a meta-analysis of event studies», *Business and Society*, 36, 221-249.

Galema, R., Plantinga, A., and Scholtens, B., 2008. «The stocks at stake: Return and risk in socially responsible investment», *Journal of Banking and Finance*, 32, 2646–2654.

Gebhardt, W., Lee, C., and Swaminathan, B. (2001), « Toward an Implied Cost of Capital », *Journal of Accounting Research*, 39, 135-176.

Gode, D., and Mohanram, P. (2003), « Inferring the Cost of Capital Using the Ohlson-Juettner Model », *Review of Accounting Studies*, 8, 399-431.

Godfrey, P. C. (2005), «The relationship between corporate philanthropy and shareholder wealth: A risk management perspective», *Academy of Management Review*, 30, 777–798.

Godfrey, P. C., Merrill. C. B., and Hansen, J. M. (2009), «The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis», *Strategic Management Journal*, 30, 425-445.

Gordon, J. R., and Gordon, M. J. (1997), « The Finite Horizon Expected Return Model », *Financial Analysts Journal*, 53, 52-61.

Goss, A. (2007), « Essays on corporate social responsibility and financial performance », PhD dissertation, York University, Toronto.

Goss, A., and Roberts, G. R. (2011), « The impact of corporate social responsibility on the cost of bank loans», *Journal of Banking and Finance*, in press. doi:10.1016/j.jbankfin.2010.12.002.

Griffin, J. J. and Mahon, J. F. (1997), «The Corporate Social Performance and Corporate Financial Performance Debate: Twenty-five years of incomparable research», *Business and Society*, 36, 5-31.

Hail, L., and Leuz, C. (2006), « International differences in the cost of equity capital: Do legal institutions and securities regulation matter? », *Journal of Accounting Research*, 44, 485–531.

Harjoto, M. A., and Jo, H. (2008), « Corporate social responsibility and operating performance », *Journal of the Academy of Business and Economics*, 8, 59-71.

Heinkel, R., Kraus, A., and Zechner. J. (2001), « The Effect of Green Investment on Corporate Behavior », *Journal of Financial and Quantitative Analysis*, 36, p. 431-449.

Hillman, A., and Keim, G. D. (2001), «Shareholder value, stakeholder management, and social issues: What's the bottom line? », *Strategic Management Journal*, 22, 125-139.

Johnson, R. D., and Greening, D. W. (1999), «The effects of corporate governance and institutional ownership types on corporate social performance», *Academy of Management Journal*, 42, 564–576.

Jorion, P. 2003. *Financial Risk Manager Handbook.* John Wiley & Sons, Inc., New Jersey.

Lankoski, L. (2009), «Differential Economic Impacts of Corporate Responsibility Issues», *Business and Society*, 48, 206-224.

Lee, C., Ng, D., and Swaminathan, B. (2009), « Testing international asset pricing models using implied costs of capital », *Journal of Financial and Quantitative Analysis*, 44, 307-335.

Lee, D. D., and Faff, R. W. (2009), «Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective», *The Financial Review*, 44, 213-237.

Liu, L. X., Whited, T. M., and Zhang, L. (2007), « Investment-Based Expected Stock Returns», Working paper, Hong Kong University of Science and Technology.

Mackey, A., Mackey, T. B., and Barney, J. B. (2007), «Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies», *Academy of Management Review*, 32, 817 – 835.

Malkiel, B.G., and Xu, Y. (1997), «Risk and return revisited», *Journal of Portfolio Management,* 23, 9–14.

Margolis, J. D., and Walsh, J. P. (2003), «Misery loves companies: rethinking social initiatives by business», *Administrative Science Quarterly*, 48, 268-305.

Markowitz, H. M. (1952), «Portfolio selection», *Journal of Finance*, 7, 77-91.

Mattingly, J. E., and Berman, S. L. (2006), «Measurement of Corporate Social Action: Discovering Taxonomy in the Kinder Lydenberg Domini Ratings Data», *Business and Society*, 45, 20-46.

McGuire, J. B., Sundgren, A., and Schneeweis, T. (1988), «Corporate Social Responsibility and Firm Financial Performance», *Academy of Management Journal*, 31, 854-872.

Merton, R.C. (1987), «A simple model of capital market equilibrium with incomplete information», *Journal of Finance*, 42, 483–510.

Oikonomou, I., Brooks, C., et Pavelin, S. (2012), «The impact of corporate social performance on financial risk and utility: A longitudinal analysis», *Financial Management*, 41, 483–515.

Orlitzky M. and Benjamin J. D., (2001), «Corporate Social Performance and Firm Risk: A meta-analytic Review», *Business and Society*, 40, 369-396.

Orlitzky M., Schmidt F.L. and Rynes S.L., (2003), «Corporate social and financial performance: a meta-analysis», *Organization Studies*, 24, 403-441.

Rehbein, K., Waddock, S. A., and Graves, S. B. (2004), «Understanding shareholder activism: Which corporations are targeted? », *Business and Society*, 43, 239-267.

Salama, A., Anderson, K., and Toms, J. S. (2011), «Does community and environmental responsibility affect firm risk: Evidence from UK panel data 1994-2006», *Business Ethics: A European Review*, 20, 192-204.

Sharfman, M. P., and Fernando, C. S. (2008), «Environmental risk management and the cost of capital», *Strategic Management Journal*, 29, 569-592.

Simpson, W. G., and Kohers, T. (2002), « The Link between Corporate Social and Financial Performance: Evidence from the Banking Industry», *Journal of Business Ethics*, 35, 97-109.

Spicer, B. H. (1978), «Investors, corporate social performance, and information disclosure: An empirical study», *The Accounting Review*, 53, 94-111.

Starks, L. T. (2009), «Corporate Governance and Corporate Social Responsibility: What Do Investors Care about? What Should Investors Care about? », *The Financial Review*, 44, 461-468.

Waddock, S. A. (2003), «Myths and realities of social investing», *Organization and Environment*, 16, 369-380.

Waddock, S. A., and Graves, S. B. (1997), «The Corporate Social Performance-Financial Performance Link», *Strategic Management Journal*, 18, 303-319.

CONCLUSION

De nombreuses études ont examiné la relation entre la performance sociale (PS) et la performance financière, mais peu se sont penchées sur la relation entre PS et le risque des entreprises. Pourtant, certains auteurs (Starks, 2009) soutiennent que PS affecte plutôt le risque que le niveau des flux monétaires attendus. La présente thèse s'inscrit dans ce courant récent et, sur la base de plusieurs arguments théoriques proposés dans la littérature, elle vise à contribuer à une meilleure compréhension de la relation entre la performance sociale (PS) et le risque des entreprises américaines et ce, durant la période 1991-2007.

À partir d'un large panel d'entreprises non financières, le premier article examine différentes relations entre différentes mesures de risque et de performance sociale (PS). Dans un premier temps, nos résultats montrent que la mesure agrégée de PS, qui combine les forces (*strengths*) et les faiblesses (*concerns*) sociales, est significativement et négativement reliée à la volatilité des rendements boursiers. Lorsque nous utilisons des mesures distinctes pour les forces et pour les faiblesses, nous constatons que des scores plus élevés tant des forces que des faiblesses sociales augmentent le risque total de l'entreprise. Toutefois, l'augmentation de la volatilité associée aux forces sociales est plus faible que celle associée aux faiblesses. Les autres mesures de risque utilisées montrent que cette augmentation du risque total est principalement due à celle du risque idiosyncratique plutôt qu'à celle du risque systématique.

Dans un deuxième temps, en examinant la causalité inverse nos résultats montrent que les risques total et idiosyncratique affectent à leur tour positivement et significativement les forces et les faiblesses sociales. Dans un troisième temps enfin, une relation simultanée entre la PS et le risque a été testée et ce, en contrôlant pour les effets du coût du capital-action. Les résultats montrent qu'il y a une relation bidirectionnelle entre la mesure agrégée des forces sociales et le risque. Plus précisément, des scores élevés des forces sociales conduisent à des risques total et idiosyncratique élevés, et en même temps, des risques total et idiosyncratique élevés conduisent à des scores élevés des forces sociales. Les forces sociales affecte le risque de l'entreprise qui à son tour, l'affecte. Les résultats montrent aussi qu'il y a une relation

unidirectionnelle entre la mesure agrégée des faiblesses sociales et le risque. Des risques total et idiosyncratique élevés conduisent à des scores élevés des faiblesses sociales. Autrement dit, les entreprises les plus risquées affichent une mauvaise PS, des faiblesses. Toutefois, nos résultats montrent qu'il n y a aucun effet de compensation entre les forces et les faiblesses sociales.

En résumé, les résultats du premier article suggèrent que PS est reliée au risque total de l'entreprise principalement en raison du risque idiosyncratique. Ils suggèrent également que les entreprises ayant des scores plus élevés de forces et de faiblesses sociales ont un risque plus élevé. La relation entre les forces sociales et le risque est bidirectionnelle, alors que celle entre les faiblesses sociales et le risque est unidirectionnelle. Il y a aussi des preuves empiriques d'une relation asymétrique entre le risque de l'entreprise et PS dans laquelle l'impact des faiblesses sociales sur le risque est plus élevé que l'impact des forces sociales.

Le deuxième article examine la relation entre les dimensions individuelles de la performance sociale (PS) et les risques total et idiosyncratique pour les entreprises non financières. Nous avons analysé l'échantillon total, ainsi que deux sous-échantillons formés sur la base de l'appartenance à l'indice S&P500. Dans la première partie de notre analyse, nous avons utilisé des mesures des dimensions individuelles de PS, mesures qui combinent les forces et les faiblesses sociales pour chaque dimension. Nous avons trouvé que seulement certaines dimensions de PS affectent le risque des entreprises non financières. Pour l'échantillon total, seulement les dimensions de relations avec les employés et les droits humains affectent négativement le risque des entreprises non financières. Pour les entreprises du S&P500, les dimensions de relations avec les employés, la gouvernance d'entreprise et la communauté affectent négativement le risque, alors que l'environnement affecte positivement le risque. Pour les entreprises non incluses au S&P500, seulement les dimensions de relations avec les employés, la communauté et l'environnement affectent négativement le risque. Les autres dimensions (diversité, droits humains et produit) n'affectent pas significativement le risque pour les deux sous-échantillons.

Dans la deuxième partie de notre analyse, nous avons utilisé des mesures distinctes des forces et des faiblesses sociales et ce, pour chaque dimension. Plusieurs auteurs (par exemple, Mattingly et Berman, 2006) soutiennent que les forces et les faiblesses sociales sont des construits conceptuellement distincts et donc ne devraient pas être combinés dans les travaux empiriques. Pour l'échantillon total, deux principales conclusions peuvent être tirées de notre analyse basée sur cette distinction. Premièrement, les faiblesses sociales en matière de relations avec les employés, la gouvernance d'entreprise, la diversité et les droits humains augmentent le risque des entreprises non financières. Deuxièmement, les forces en matière de gouvernance d'entreprise et de diversité augmentent le risque des entreprises non financières. Pour les entreprises du S&P500, les faiblesses sociales en matière de relations avec les employés, la gouvernance d'entreprise et la diversité augmentent le risque, tandis que les forces en matière de relations avec la communauté (diversité) réduisent (augmentent) le risque. Pour les entreprises non incluses au S&P500, les faiblesses sociales en matière de relations avec les employés et les forces en matière de diversité augmentent le risque, tandis que les forces en matière d'environnement réduisent le risque. Enfin, nous avons examiné les liens de causalités entre d'une part, les forces et les faiblesses sociales de chaque dimension de PS, et d'autre part, les risques totale et idiosyncratique. Nos résultats montrent que la causalité a tendance à varier selon les différentes dimensions de PS. Les différentes dimensions de PS n'ont pas tous le même type d'interaction avec le risque.

Nos conclusions concernant l'impact positif sur le risque des entreprises non financières des faiblesses sociales en matière de relations avec les employés, la gouvernance d'entreprise et la diversité sont compatibles avec les arguments théoriques prédisant une relation négative entre PS et le risque tels que la théorie des parties prenantes et la gestion des risques sociaux et environnementaux. Par exemple, indépendamment de leurs préférences d'investissement, les investisseurs seront plus touchés par les faiblesses (*concerns*) sociales qui affectent le niveau et le risque des flux monétaires attendus, tels que l'augmentation du risque de boycott et de dommages à la marque et à la réputation de l'entreprise suite à une publicité négative faite par les médias et les ONG.

Contrairement aux faiblesses, l'impact des forces sociales sur le risque n'est pas uniforme et dépend de la nature de la dimension individuelle de PS. Ainsi, nos résultats montrent que les entreprises non financières ayant des forces sociales en matière d'environnement et de relations avec la communauté sont perçues comme des investissements moins risqués, alors que celles ayant des forces sociales en matière de diversité sont perçues comme des investissements plus risqués. Cette dernière conclusion supporte l'hypothèse d'opportunisme des gestionnaires dans laquelle ces derniers peuvent «surinvestir» dans leurs actions de RSE, renforçant leurs forces sociales et ce, uniquement pour leur bénéfice privé. Ainsi, ces gestionnaires peuvent choisir d'améliorer leur réputation et leur image de citoyens socialement responsables afin de gagner le soutien des parties prenantes, et ce, même au détriment des actionnaires (Cespa et Cestone, 2007; Barnea et Rubin, 2010). Les impacts différents des forces sociales sur le risque des entreprises non financières pourraient être attribuables au fait qu'investisseurs et analystes financiers ne s'entendent ni sur la valeur des forces sociales ni sur leurs impacts sur le niveau et le risque des flux monétaires attendus (Ioannou et Serafeim, 2010; Edmans, 2011).

Le troisième article examine la relation entre la performance sociale et le risque en se concentrant uniquement sur les firmes financières. Pour atteindre notre objectif, nous considérons diverses mesures de PS, tant au niveau global qu'au niveau de composantes/dimensions particulières de celle-ci et diverses mesures de risque dont le risque total, ses deux composantes systématique et idiosyncratique, ainsi qu'une mesure de risque de perte, à savoir la Valeur à Risque (VaR). Afin d'examiner la relation entre PS et le risque, nous avons effectué deux types d'analyses. En premier lieu, nous avons examiné l'impact des mesures agrégées de PS, qui combinent plusieurs dimensions, sur les mesures de risque des entreprises financières. En deuxième lieu, nous avons examiné l'impact des dimensions individuelles de PS sur les mesures de risque des entreprises financières.

Plusieurs conclusions importantes peuvent être tirées de nos analyses. Premièrement, la mesure agrégée de PS, qui agrège les forces et les faiblesses sociales, est négativement reliée à la volatilité des rendements boursiers, au risque systématique et à la VaR. La mesure agrégée des faiblesses uniquement est positivement reliée à toutes les mesures de risque. Toutefois, La mesure agrégée des forces n'affecte pas significativement les mesures de

risque. Par conséquent, nous concluons que les entreprises financières ayant des scores plus élevés au niveau des faiblesses sociales affichent un risque plus élevé.

Nous pouvons en déduire que l'impact négatif de la mesure agrégée de PS sur le risque d'une entreprise financière est principalement dû à des faiblesses sociales, ce qui suggère une relation asymétrique entre PS et le risque. Nos résultats concernant l'impact positif sur le risque des entreprises financières des faiblesses sociales sont compatibles avec les arguments théoriques prédisant une relation négative entre PS et le risque (par exemple, Heinkel *et al.,* 2001; Barnea *et al.,* 2005; Mackey *et al.,* 2007). Ils sont également compatibles avec les résultats des études précédentes (par exemple, Frooman, 1997; Godfrey *et al.,* 2009; Oikonomou *et al.*, 2012; Goss et Roberts, 2011) suggérant que l'impact des faiblesses sociales sur le risque est plus important que l'impact des forces sociales. Certains auteurs (par exemple, Lankoski, 2009) soutiennent que la plus grande priorité pour les parties prenantes semblent être que l'entreprise devrait éviter ou réduire ses faiblesses sociales et non pas entreprendre ou avoir des forces sociales. Ainsi, les investisseurs semblent donner plus de poids pour les faiblesses sociales relativement aux forces sociales.

Deuxièmement, en affinant la mesure de PS nous constatons que seules certaines dimensions de PS affectent le risque des entreprises financières. Ainsi, les faiblesses sociales en matière de relations avec les employés, de produit et de la gouvernance d'entreprise augmentent toutes les mesures de risque des entreprises financières. Par contre, excluant les forces au niveau de la dimension «produit» qui accroit la VaR, aucune des autres forces sociales n'a d'impact sur le risque. Finalement, en distinguant les différentes catégories de firmes financières, à savoir les banques, les firmes d'investissement et les compagnies d'assurance, nos résultats montrent que la performance sociale affecte le risque des banques et celui des firmes d'investissement (courtage), excluant les entreprises d'assurance. Par exemple, les deux mesures agrégées des forces et des faiblesses sociales influent positivement sur le risque d'une banque.

Nos résultats concernant l'impact positif sur le risque des entreprises financières des forces (*strengths*) sociales (par exemple, dans le cas des banques) peuvent être expliqués par l'hypothèse d'opportunisme des gestionnaires qui est basé sur la théorie d'agence et qui suggère que les gestionnaires pourront entreprendre des investissements en matière de RSE (pour avoir des forces sociales) pour leur bénéfice privé (par exemple, pour améliorer leur propre réputation et sécuriser leur emploi), et ce, même au détriment des actionnaires (Cespa et Cestone, 2007; Barnea et Rubin, 2010). Ces coûts d'agence peuvent être considérés comme une diversion coûteuse des ressources rares de l'entreprise, ce qui augmente le risque. Une autre explication plausible est que le marché boursier n'évalue pas correctement les actifs intangibles (Edmans, 2011).

Dans l'ensemble, les résultats du troisième article pourraient être intéressants à plusieurs niveaux. Pour les investisseurs et les analystes financiers, nos résultats suggèrent que les faiblesses (*concerns*) sociales devraient être incluses comme un risque extra-financier important dans l'évaluation des institutions financières. Nos résultats pourraient également aider les régulateurs dans leur rôle de surveillance des institutions financières.

Contributions à la recherche

Cette recherche se distingue des autres selon plusieurs aspects. Tout d'abord au niveau de la mesure de PS, certes nous avons recouru à la mesure la plus utilisée à savoir celle de KLD. Toutefois, nous avons utilisé d'autres formulations de la PS tant au niveau des agrégations globales qu'au niveau des dimensions. Cette nuance n'a été effectuée que dans quelques-unes des rares études portant sur la relation entre le risque et la PS. Nous avons aussi utilisé diverses mesures de risque. Au-delà des mesures traditionnellement utilisées et rarement simultanément, nous avons utilisé la VaR pour les entreprises financières. Enfin, étant donné les spécificités des firmes financières, nous avons étudié la relation entre le risque et la PS dans le contexte des entreprises non-financières puis dans le cadre particulier des entreprises financières. Ces dernières sont fondamentalement différentes des autres entreprises (Diamond et Rajan, 2000; Jorion, 2003).

Par ailleurs, notre thèse présente un intérêt pratique pour les investisseurs individuels ou institutionnels et pour les analystes. Nos résultats pourraient permettre d'adapter le développement des portefeuilles selon les besoins des investisseurs, et ce, en tenant compte de l'impact de PS et ses dimensions individuelles (informations extra-financières) sur le risque de ses portefeuilles. Nos résultats pourraient également permettre aux investisseurs institutionnels d'optimiser l'intégration des critères ESG (environnement, social et gouvernance) afin de mieux gérer le risque de leurs portefeuilles. Dans l'ensemble, notre thèse permet de mieux comprendre si l'investissement responsable est une stratégie efficace de gestion des risques.

Dans notre thèse nous avons fait l'hypothèse implicite que toutes les dimensions individuelles de PS ont la même importance dans le calcul des mesures agrégées de PS, des forces et des faiblesses sociales. Cette hypothèse pourrait être difficilement soutenable dans la mesure où les enjeux sociaux et environnementaux, ainsi que le degré d'activisme sur ces enjeux varient selon plusieurs facteurs comme le secteur d'activité et la taille de l'entreprise. Toutefois, il n'existe aucun consensus dans la littérature académique sur la manière de distinguer le degré d'importance des dimensions individuelles de PS pour une entreprise ou un investisseur donné. Pour cette raison, la majorité des études font l'hypothèse de l'égalité du degré d'importance des différentes dimensions de PS lors du calcul des mesures agrégées de PS. Malgré son importance, cette question n'est pas étudiée dans cette thèse. Une approche multicritères pour la prise de décision semble être une approche prometteuse pour une recherche future. L'approche multicritères est très avantageuse et pourrait constituer un outil privilégié pour un gestionnaire de portefeuille dont les clients demandent les meilleures opportunités d'investissement socialement responsable.

Les résultats de cette thèse suggèrent plusieurs avenues de recherches futures. Premièrement, il serait intéressant d'examiner si nos résultats sont transposables dans d'autres lieux géographiques. Il serait donc souhaitable d'étendre notre étude à d'autres contextes en utilisant d'autres mesures de PS. Deuxièmement, nous avons considéré la mesure du Valeur à Risque (VaR) seulement pour les entreprises financières. Il serait donc intéressant d'examiner l'impact de PS et de ses dimensions individuelles sur la VaR pour les entreprises non financières. D'autres extensions possibles incluent l'examen de la relation entre PS et ses

dimensions individuelles et d'autres mesures de risque extrême (*tail risk*) tels que le *expected shortfall*, *coskweness* et *cokurtosis*. Troisièmement, la récente crise financière offre une bonne opportunité pour examiner s'il y a une variation systématique de l'impact de PS sur le risque entre les périodes pré-et post-crise. Enfin, il serait intéressant d'étudier l'impact de PS sur d'autres sources importantes de risque pour les entreprises financières telles que le risque de crédit et le risque opérationnel.

RÉFÉRENCES

Alexander, C., et Sheedy, E. 2004. *The Professional Risk Managers' Handbook: A Comprehensive Guide to Current Theory and Best Practices*. The Professional Risk Managers' International Association.

Altman, E. 1993. *Corporate financial distress and bankruptcy*, Chap 5, John Wiley and Sons, New York.

Amihud, Y. (2002), « Illiquidity and stock returns: cross-section and time-series effects», *Journal of Financial Markets*, 5, 31-56.

Ang, A., Hodrick, R. J., Xing, Y., et Zhang, X. (2006), «The Cross-Section of Volatility and Expected Returns», *Journal of Finance*, 61, 259–299.

Barnea, A., et Rubin, A. (2010), «Corporate social responsibility as a conflict between shareholders», *Journal of Business Ethics*, 97, 71–86.

Barnea, A., Heinkel. R., et Kraus, A. (2005), «Green investors and corporate investment», *Structural Change and Economic Dynamics*, 16, 332–346.

Barnett, M.L, et Salomon, R.M. (2006), «Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance», *Strategic Management Journal*, 27, 1101-1122.

Baron, D., Harjoto, M., et Jo, H. (2011), «The economics and politics of corporate social performance», *Business and Politics*, 13, 1–46.

Bates, T. W., Kahle, K. M., et Stulz, R. (2009), « Why Do U.S. Firms Hold So Much More Cash than They Used To? », *Journal of Finance*, 64, 1985–2021.

Bauer, R., Derwall, J., et Hann, D. (2009), «Employee Relations and Credit Risk», Available at SSRN: http://ssrn.com/abstract=1483112

Berk, J., Green, R. C., et Naik, V. (1999), « Optimal investment, growth options, and security returns », *Journal of Finance*, 54, 1553–1607.

Berkowitz, J., et O'Brien, J. (2002), «How Accurate Are Value-at-Risk Models at Commercial Banks? », *Journal of Finance*, 3, 1093-1111.

Berman, S.L., Wicks, A.C., Kotha, S., et Jones, T.M. (1999), «Does Stakeholder Orientation Matter? The Relationship between Stakeholder Management Models and Firm Financial Performance», *Academy of Management Journal*, 42, 488-506.

Bird, R., Hall, A., Momentè, F., et Reggiani, F. (2007), «What Corporate Social Responsibility Activities are Valued by the Market? », *Journal of Business Ethics*, 76, 189–206.

Botosan, C. A., et Plumlee, M. A. (2005), «Assessing Alternative Proxies for the Expected Risk Premium», *The Accounting Review*, 80, 21-53.

Bouslah, K., M'Zali, B., Turcotte, M-F., et Kooli, M. (2010), « The Impact of Forest Certification on Firm Financial Performance in Canada and the U.S. », *Journal of Business Ethics*, 96, 551-572.

Boutin-Dufresne, F. et Savaria, P. (2004), « Corporate Social Responsibility and Financial Risk», *Journal of Investing*, 13, 57-66.

Brammer, S., Brooks, C., et Pavelin, S. (2006), «Corporate Social Performance and Stock Returns: UK Evidence from Disaggregate Measures», *Financial Management*, 35, 97-116.

Brennan, M. J., Chordia, T., et Subrahmanyam, A. (1998), « Alternative factor specifications, security characteristics, and the cross-section of expected stock returns», *Journal of Financial Economics*, 49, 345-373.

Capron, M., et Quairel-Lanoizelée, F. 2010. *La responsabilité sociale d'entreprise*. Édition La Découverte, Paris.

Carhart, M. M. (1997), «On Persistence in Mutual Fund Performance», *Journal of Finance*, 52, 57-82.

Carlson, M., Fisher, A., et Giammarino, R. (2004), « Corporate investment and asset price dynamics: Implications for the cross-section of returns », *Journal of Finance*, 59, 2577–2603.

Carlson, M., Fisher, A., et Giammarino, R. (2006), « Corporate Investment and Asset Price Dynamics: Implications for SEO Event Studies and Long-Run Performance », *Journal of Finance*, 61, 1009-1034.

Carroll, A.B., (1979), «A three-dimensional conceptual model of corporate performance», *The Academy of Management Review*, 4, 497-505.

Carroll, A. B. (1999), «Corporate Social Responsibility: Evolution of a Definitional Construct», *Business and Society*, 38, 268-295.

Carroll, A. B. (2000), «A commentary and an overview of key questions on corporate social performance measurement», *Business and Society*, 39, 466-478.

Cespa, G., et Cestone, G. (2007), «Corporate social responsibility and managerial entrenchment», *Journal of Economics and Management Strategy,* 16, 741-771.

Chatterji, A., Levine, D.I., et Toffel, M. W. (2009), «How well do social ratings actually Measure corporate social responsibility?», *Journal of Economics and Management Strategy*, 18, 125-169.

Chen, C. R., Steiner, T. L., et Whyte, A. M. (2006), «Does stock option-based executive compensation induce risk-taking? An analysis of the banking industry», *Journal of Banking and Finance*, 30, 915–945.

Chordia, T., Subrahmanyam, A., et Anshuman, R. (2001), «Trading activity and expected stock returns», *Journal of Financial Economics*, 59, 3-32.

Choudhry, M. 2006. *An introduction to value at risk*. John Wiley & Sons Ltd, England.

Christoffersen, P. F. 2003. *Elements of financial risk management*. Academic Press, Elsevier Science, California, USA.

Claus, J., et Thomas, J. (2001), « Equity Premia as Low as Three Percent? », *Journal of Finance*, 56, 1629-1666.

Cochrane, J. (1991), « Production-based asset pricing and the link between stock returns and economic fluctuations », *Journal of Finance*, 46, 209–237.

Derwall, J. et Verwijmeren, P. (2007), «Corporate Social Responsibility and the Implied Cost of Equity Capital», Working paper, RSM Erasmus University.

Dhaliwal, D.S., Li, O.Z., Tsang, A.H., et Yang, Y.G. (2010), «Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting», *The Accounting Review*, in press. doi: 10.2308/accr.00000005.

Diamond, D. W., et Rajan, R. G. (2000), «A Theory of Bank Capital», *Journal of Finance*, 55, 2431-2465.

Donaldson, T., et Preston, L. E. (1995), «The stakeholder theory of the corporation: Concepts, evidence, and implications», *Academy of Management Review*, 20, 65-91.

Easton, P. (2004), « PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital », *Accounting Review,* 79, 73-95.

Edmans, A. (2011), « Does the stock market fully value intangibles? Employee satisfaction and equity prices », *Journal of Financial Economics*, in press. doi:10.1016/j.jfineco.2011.03.021.

El Ghoul, S., Guedhami, O., Kwok, C., et Mishra, D. (2011), «Does corporate social responsibility affect the cost of capital? », *Journal of Banking and Finance*, in press. doi:10.1016/j.jbankfin.2011.02.007.

Fama, E. F., et French, K. R. (1992), « The Cross-Section of Expected Stock Returns», *Journal of Finance*, 47, 427-465.

Fama, E. F., et French, K. R. (1993), « Common Risk Factors in the Returns on Stocks and Bonds », *Journal of Financial Economics*, 33, 3-56.

Fama, E. F., et French. K. R. (1997), « Industry cost of equity », *Journal of Financial Economics*, 43, 153-193.

Fama, E.F., et French, K. R. (2007), «Disagreement, tastes and asset prices», *Journal of Financial Economics*, 83, 667-689.

Fangjian, F. (2009), «Idiosyncratic risk and the cross-section of expected stock returns», *Journal of Financial Economics*, 91, 24-37.

Feldman, J., Soyka, P., et Ameer, P. (1997), «Does improving a firm's environmental management system and environmental performance result in a higher stock price?», *Journal of Investing*, 6, 87-97.

Fernando, C.S., Sharfman, M. P., et Uysal V. B. (2009), «Does Greenness Matter? The Effect of Corporate Environmental Performance on Ownership Structure, Analyst Coverage and Firm Value», Working Paper, University of Oklahoma.

Freeman, R. E. 1984. *Strategic management: A stakeholder approach*. Boston: Pitman/Ballinger.

Frooman, J. (1997), «Socially irresponsible and illegal behavior and shareholder wealth: a meta-analysis of event studies», *Business and Society*, 36, 221-249.

Galema, R., Plantinga, A., et Scholtens, B., (2008), «The stocks at stake: Return and risk in socially responsible investment», *Journal of Banking and Finance*, 32, 2646–2654.

Gebhardt, W., Lee, C., et Swaminathan, B. (2001), « Toward an Implied Cost of Capital », *Journal of Accounting Research*, 39, 135-176.

Gode, D., et Mohanram, P. (2003), « Inferring the Cost of Capital Using the Ohlson- Juettner Model », *Review of Accounting Studies*, 8, 399-431.

Godfrey, P. C. (2005), «The relationship between corporate philanthropy and shareholder wealth: A risk management perspective», *Academy of Management Review*, 30, 777–798.

Godfrey, P. C., Hatch. N.W., et Hansen, J. M. (2008), «Toward a General Theory of CSRs: The Roles of Beneficence, Profitability, Insurance, and Industry Heterogeneity», *Business and Society*, doi: 10.1177/0007650308315494.

Godfrey, P. C., Merrill. C. B., et Hansen, J. M. (2009), «The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis», *Strategic Management Journal*, 30, 425-445.

Gordon, J. R., et Gordon, M. J. (1997), «The Finite Horizon Expected Return Model», *Financial Analysts Journal*, 53, 52-61.

Goss, A. (2007), « Essays on corporate social responsibility and financial performance », PhD dissertation, York University, Toronto.

Goss, A. (2012), « Corporate social performance and idiosyncratic risk: a variance decomposition analysis», 2012 Midwest Finance Association Annual Meeting (Midwest Finance Association).

Goss, A., et Roberts, G. S. (2011), «The impact of corporate social responsibility on the cost of bank loans», *Journal of Banking and Finance*, in press. doi:10.1016/j.jbankfin.2010.12.002.

Goyal, A., et Santa-Clara, P. (2003), «Idiosyncratic Risk Matters!», *Journal of Finance*, 58, 975–1008.

Granger, C. W. J. (1969), «Investigating causal relations by econometric models and cross-spectral methods», *Econometrica*, 37, 424–438.

Graves, S. B., et Waddock, S. A. (1994), « Institutional owners and corporate social performance», *Academy of Management Journal,* 37, 1034-1046.

Griffin, J. J. et Mahon, J. F. (1997), «The Corporate Social Performance and Corporate Financial Performance Debate: Twenty-five years of incomparable research», *Business and Society*, 36, 5-31.

Hail, L., et Leuz, C. (2006), « International differences in the cost of equity capital: Do legal institutions and securities regulation matter? », *Journal of Accounting Research*, 44, 485–531.

Harjoto, M. A., et Jo, H. (2008), «Corporate social responsibility and operating performance», *Journal of the Academy of Business and Economics*, 8, 59-71.

Harjoto, M. A., et Jo, H. (2011), «Corporate Governance and CSR Nexus», *Journal of Business Ethics*, 100, 45-67.

Heinkel, R., Kraus, A., et Zechner. J. (2001), « The Effect of Green Investment on Corporate Behavior », *Journal of Financial and Quantitative Analysis*, 36, p. 431-449.

Hillman, A., et Keim, G. D. (2001), «Shareholder value, stakeholder management, and social issues: What's the bottom line? », *Strategic Management Journal*, 22, 125-139.

Hong, H., et Kacperczyk, M. (2009), «The price of sin: The effects of social norms on markets», *Journal of Financial Economics*, 93, 15–36.

Ioannou, I., et Serafeim, G. (2010), «The impact of corporate social responsibility on investment recommendations», Working paper, Harvard Business School.

Jo, H., et Harjoto, M. A. (2012), «The Causal Effect of Corporate Governance on Corporate Social Responsibility», *Journal of Business Ethics*, 106, 53-72.

Johnson, R. D., et Greening, D. W. (1999), «The effects of corporate governance and institutional ownership types on corporate social performance», *Academy of Management Journal*, 42, 564–576.

Jorion, P. 2003. *Financial Risk Manager Handbook*. John Wiley & Sons, Inc., New Jersey.

Kane, G. D., Velury, U., et Ruf, B. M. (2005), «Employee Relations and the Likelihood of Occurrence of Corporate Financial Distress», *Journal of Business Finance & Accounting*, 32, 1083-1105.

Kinder, P., et Domini, A. L. (1997), «Social screening: Paradigms old and new», *Journal of Investing*, 6, 12-19.

Lacy, P., Cooper, T., Hayward, R., et Neuberger, L. (2010), «A New Era of Sustainability-UN Global Compact-Accenture CEO Study 2010», Available at: http://www.accenture.com/us-en/Pages/insight-un-global-compact-reports.aspx

Lankoski, L. (2009), «Differential Economic Impacts of Corporate Responsibility Issues», *Business and Society*, 48, 206-224.

Lee, C., Ng, D., et Swaminathan, B. (2009), « Testing international asset pricing models using implied costs of capital », *Journal of Financial and Quantitative Analysis*, 44, 307-335.

Lee, D. D., et Faff, R. W. (2009), «Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective», *The Financial Review*, 44, 213-237.

Liu, L. X., Whited, T. M., et Zhang, L. (2007), «Investment-Based Expected Stock Returns», Working paper, Hong Kong University of Science and Technology.

Love, I., et Zicchino, L. (2006), «Financial development and dynamic investment behavior: Evidence from panel VAR», *The Quarterly Review of Economics and Finance*, 46, 190–210.

Luo, X., et Bhattacharya, C. B. (2009), «The Debate over Doing Good: Corporate Social Performance, Strategic Marketing Levers, and Firm-idiosyncratic Risk», *Journal of Marketing*, 73, 198-213.

Mackey, A., Mackey, T. B., et Barney, J. B. (2007), «Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies», *Academy of Management Review*, 32, 817 – 835.

Mahoney, L., et Roberts, R. W. (2007), «Corporate social performance, financial performance and institutional ownership in Canadian firms», *Accounting Forum*, 31, 233-253.

Malkiel, B.G., et Xu, Y. (1997), «Risk and return revisited», *Journal of Portfolio Management,* 23, 9–14.

Margolis, J. D., et Walsh, J. P. (2003), «Misery loves companies: rethinking social initiatives by business», *Administrative Science Quarterly*, 48, 268-305.

Markowitz, H. M. (1952), «Portfolio selection», *Journal of Finance*, 7, 77-91.

Mattingly, J. E., et Berman, S. L. (2006), «Measurement of Corporate Social Action: Discovering Taxonomy in the Kinder Lydenberg Domini Ratings Data», *Business and Society*, 45, 20-46.

McGuire, J. B., Sundgren, A., et Schneeweis, T. (1988), «Corporate Social Responsibility and Firm Financial Performance», *Academy of Management Journal*, 31, 854-872.

McGuire, J., Dow, S., et Argheyd, K. (2003), «CEO incentives and corporate social performance», *Journal of Business Ethics*, 45, 341-359.

McWilliams, A. et Siegel, D. (2000), «Corporate Social Responsibility and Financial Performance: Correlation or Misspecification?», *Strategic Management Journal*, 21, 603-609.

Merton, R. C. (1987), «A simple model of capital market equilibrium with incomplete information», *Journal of Finance*, 42, 483–510.

Nelling, E., et Webb, E. (2009), «Corporate social responsibility and financial performance: the ''virtuous circle'' revisited», *Review of Quantitative Finance and Accounting*, 32, 197–209.

Ohlson, J., et Juettner-Nauroth, B. E. (2005), « Expected EPS and EPS Growth as Determinants of Value », *Review of Accounting Studies*, 10, 349-365.

Oikonomou, I., Brooks, C., et Pavelin, S. (2012), «The impact of corporate social performance on financial risk and utility: A longitudinal analysis», *Financial Management*, 41, 483–515.

Orlitzky, M., et Benjamin, J. D. (2001), «Corporate Social Performance and Firm Risk: A meta-analytic Review», *Business and Society*, 40, 369-396.

Orlitzky, M., Schmidt, F. L., et Rynes, S. L. (2003), «Corporate social and financial performance: a meta-analysis», *Organization Studies*, 24, 403-441.

Pava, M. L., et Krausz, J. (1996), «The Association Between Corporate Social-Responsibility and Financial Performance: The Paradox of Social Cost», *Journal of Business Ethics*, 15, 321-357.

Petersen, M. A. (2009), «Estimating standard errors in finance panel data sets: Comparing approaches», *Review of Financial Studies*, 22, 435–480.

Preston, L. E., et O'Bannon, D. P. (1997), «The corporate social-financial performance relationship», *Business and Society*, 36, 419-429.

Rehbein, K., Waddock, S. A., et Graves, S. B. (2004), «Understanding shareholder activism: Which corporations are targeted? », *Business and Society*, 43, 239-267.

Rivoli, P. (2003), «Labor standards in the global economy: Issues for investors», *Journal of Business Ethics*, 43, 223–232.

Roman, M. R., Hayibor, S., et Agle, B. R. (1999), «The Relationship Between Social and Financial Performance: Repainting a Portrait », *Business and Society*, 38, 109-125.

Salama, A., Anderson, K. P., et Toms, S. (2011), « Does community and environmental responsibility affect firm risk: Evidence from UK panel data 1994-2006», *Business Ethics: A European Review*, 20, 192-204.

Scholtens, B. (2008), «A note on the interaction between corporate social responsibility and financial performance», *Ecological Economics*, 68, 46 - 55.

Sharfman, M. P., et Fernando, C. S. (2008), «Environmental risk management and the cost of capital», *Strategic Management Journal*, 29, 569-592.

Shleifer, A., et Vishny, R. W. (1997), «The Limits of Arbitrage», *Journal of Finance*, 52, 35-55.

Simpson, W. G., et Kohers, T. (2002), « The Link between Corporate Social and Financial Performance: Evidence from the Banking Industry», *Journal of Business Ethics*, 35, 97-109.

Social Investment Forum (SIF), 2010 Report on Socially Responsible Investing Trends in the United States. http://www.ussif.org/

Social Investment Organization (SIO), Canadian Socially Responsible Investment Review 2010. www.socialinvestment.ca

Spicer, B. H. (1978), «Investors, corporate social performance, and information disclosure: An empirical study», *The Accounting Review*, 53, 94-111.

Starks, L. (2009), «Corporate governance and corporate social responsibility: what do investors care about? what should investors care about? », *The Financial Review*, 44, 461–468.

Stultz, R. M. 2002. *Risk management and derivatives*. Southwestern College Publications, New York.

Tsoutsoura, M. (2004), «Corporate social responsibility and financial performance», Working paper, Center for Responsible Business, Haas School of Business, University of California at Berkeley.

Ullmann, A. A. (1985), «Data in Search of Theory: A Critical Examination of the Relationship Among Social Performance, Social Disclosure, and Economic Performance of US Firms», *Academy of Management Review*, 10, 540-577

Waddock, S. A. (2003), «Myths and realities of social investing», *Organization and Environment*, 16, 369-380.

Waddock, S. A., et Graves, S. B. (1997), «The Corporate Social Performance-Financial Performance Link», *Strategic Management Journal*, 18, 303-319.

Witmer, J., et Zorn, L. (2007), « Estimating and Comparing the Implied Cost of Equity for Canadian and U.S. Firms », Bank of Canada Working Paper No. 2007-48.

Wood, D.J., 1991. «Corporate social performance revisited». *Academy of Management Review*, 16, 691-718.