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HUMAN RESOURCES AND MANUFACTURING: WHERE AND WHEN SHOULD THEY BE ALIGNED?

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ABSTRACT

Purpose – The aim of this study is to analyse the effect that a horizontal fit between two functions (human resources and manufacturing) has on firm performance, distinguishing between fit in objectives and fit in achievements.

Design/methodology/approach – This study uses 144 double surveys, addressed to two different respondents per company. Structural equations modelling was used to investigate the mediating role of fit in achievements in the relationship between fit in objectives and performance.

Findings – The study provides evidence of the particular way in which the two components of horizontal fit that we distinguish (fit in objectives and fit in achievements) impact on performance: fit in objectives has an indirect effect on performance, which is fully mediated by the fit in achievements. The results also show that environmental dynamism has a significant impact on both the advantages and drawbacks of fit.

Practical implications – By highlighting the importance of both levels of horizontal fit and distinguishing between them, this paper calls upon human resources (HR) and manufacturing managers to show a greater understanding of the key dimensions common to both areas.

Originality/value – This study analyses horizontal fit by developing a framework of priorities in HR management (HRM) similar to that traditionally used in production management. In particular, it adapts the framework of production competence to the area of HRM to study the fit between the two functional strategies. This study also supports the value chain model proposed by Porter (1985).

Keywords Human resources strategy, Manufacturing strategy, Horizontal fit, Strategic management, Firm performance, Environmental dynamism

Paper type Research paper

HUMAN RESOURCES AND MANUFACTURING: WHERE AND WHEN SHOULD THEY BE ALIGNED?

INTRODUCTION

The formation of strategy is often seen as a top-down process (Hofer & Schendel 1978) in which a business strategy needs to be translated into functional ones that are not only consistent with it (vertical fit), but also among themselves (horizontal fit) for their effective implementation, and therefore help to enhance firm performance. Our research seeks to further explore this latter type of fit or adjustment between a firm's functional strategies, analysing the specific case of the functions of human resources (HR) and production/manufacturing.

It is assumed that fit among functions plays a major role in a firm's competitive performance. However, there is no precise operational definition of this key concept, and there is still very little empirical research on quantifying its impact (Weir et al. 2000). Both strategic human resource management (SHRM) literature (Bird & Beechler 1995; Huang 2001) and operations management literature (González-Benito & Suárez-González 2010; Vickery 1991) have frequently stressed the importance of translating a firm's overall goals into functional language (i.e., the need for vertical fit); nevertheless, the attention paid to horizontal fit in both disciplines has been much scarcer. The literature on strategic management also provides an initial insight into the study of horizontal fit via the "strategic consensus" construct when it is analysed among managers of different functional areas (Homburg et al. 1999; Pagell & Krause 2002; González-Benito et al. 2012)[2].

[2] Nevertheless, the concept of consensus is subtly different to that of fit. Strategic consensus refers to the agreement between two or more agents (whether they are top management or functional managers) over the same strategic issue (e.g., the priorities of competitive strategy) (Kellermanns et al. 2005), whereas strategic fit refers to the adjustment between two different components (e.g., two different functional strategies). Measuring

There are several arguments supporting the importance of studying fit in these two specific areas. Both operations and HR functions involve the core activities of a firm's value chain (Porter 1985). Operations (activities associated with transforming inputs into the final product) constitute one of the categories of primary activities, and are assumed to be the most critical to competitive advantage in manufacturing firms. HRM (activities involved in the recruiting, hiring, training, development, and compensation of all types of personnel) strongly supports both primary individual and other support activities, as well as the entire value chain. Moreover, there are major interdependencies between them. At the level of management practice, the manufacturing function tends to account for a large part of a firm's workforce, especially in industrial sectors. At an academic level, disciplines of manufacturing and HR overlap in such decisions as the design of job profiles or staff recruitment (Skinner 1969; Wheelwright 1984; Avella-Camarero et al. 1999).

There are some prior works that have studied the relationship between HR and manufacturing and its impact on performance (Jayaram et al. 1999; Youndt et al. 1996). These studies, however, have analysed the interrelationships between the two areas in terms of the practices undertaken within them. Our study provides a definition of horizontal fit in terms of objectives and achievements. We have chosen a more content-based approach by considering the ends; that is, what managers deem to be important in their department (objectives), rather than the means for achieving them (practices), while distinguishing between what is pursued (objectives) and what is ultimately realized (achievements).

According to Venkatraman (1989), measuring "fit" involves comparing different variables or constructs, calling for the theoretical specification of an ideal fit, and measuring each firm's

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consensus normally involves comparing the opinions rated on a common scale. By contrast, the study of fit involves comparing different variables or constructs, calling for the theoretical specification of a perfect fit, and measuring each firm's divergence from it (Venkatraman 1989).

divergence from it. We thus construct two horizontal fit indices in both levels considered based on the data provided by 144 Spanish manufacturing firms.

In sum, the aim of this paper has been to analyse whether the strategic fit of these two functional areas –HR and manufacturing- explains a significant part of firm performance. To do so, we have split the concept of horizontal fit into two, bearing in mind the two aspects that make up both the HR system and the manufacturing system: the objectives pursued and the achievements related to them. Our aim is to identify the importance that both types of fit –in objectives and in achievements– have when explaining business outcomes, as well as the causal sequence between them. In particular, we study the mediating role that fit in achievements plays between fit in objectives and firm performance.

Furthermore, we analyse the impact environmental dynamism has on the competitive effects of the two fits considered. *Environmental dynamism* refers to the degree of contextual instability and turbulence, and it is considered to be highly relevant to both strategic management and organisational performance (Dess & Origer 1987). We explore their impact on the advantages and drawbacks of achieving functional fit. These goals pose a major challenge at methodological level, as an unbiased measure of fits requires comparing the data obtained from two different sources in each firm, namely, the heads of HR and operations, which has led to the administration of a double survey.

Our work contributes to the theory and practice on the concept of fit in several ways. Firstly, it provides empirical results that vouch for the desirable effects of fit among functions, and especially the areas of HR and manufacturing. Secondly, a valid and unbiased measure of fit is developed that can not only be adapted for the analysis of other functional areas but may also contribute to the literature on consensus-performance and, in general, on the strategic process by identifying horizontal fit as a new mediator variable. Thirdly, light is shed onto the factors (mediator and moderator) that affect the relationship between fit and performance, and

so our study may contribute to management practice by identifying the means and contexts that may improve the effectiveness of the implementation of functional strategies.

The paper has the following structure: the next section contains a review of the literature on the main components of both HR and manufacturing strategies (objectives and achievements). This is followed by the presentation of the hypotheses to be verified, discriminating the effects of both fits considered. Section four describes the main decisions involved in the methodological design. The subsequent section discloses and discusses the main results. Finally, the paper's main conclusions are presented, including their theoretical and practical implications, as well as the study's limitations.

HR AND MANUFACTURING STRATEGIES

Both systems -HR and manufacturing- have three interrelated aspects located at different hierarchical levels (González-Benito & Suárez-González 2010; Kepes & Delery 2007; Leong et al. 1990) (see Figure 1): objectives (strategy pursued), practices (means), and achievements (strategy achieved). The system's objectives are those specific goals or priorities that a firm establishes for each functional area. These functional objectives should likewise be aligned with the business goals and competitive strategy. Practices are the specific decisions made for implementing the strategy in each decision-making area (e.g., recruitment, training or remuneration in HR, and facilities, technology, and planning and control in manufacturing). Finally, achievements are the degrees of fulfilment of the objectives initially proposed.

As regards the two functional ambits considered individually, a broad study has been made of strategic priorities or goals in terms of costs, quality and flexibility (Jayaram et al. 1999; Youndt et al. 1996). The terms used coincide, but the content of each one of the constructs differs for each area, although they may be considered similar or equivalent. Figure 1 shows these priorities in both functional areas.

In the HR function, the cost objective refers to the quest for improvements in labour productivity. By contrast, and as regards the production function, the cost dimension refers to the search for greater efficiency.

Concerning the quality objective in the HR function, quality is considered to be both a workforce attribute (referring to levels of staff qualifications and training) and an HR system attribute (referring here to the use of management techniques and practices based on criteria of excellence and the development of human capital) (Quijano et al. 2005). In the production function, quality is the objective that focuses on meeting customers' needs in the best possible way and fulfilling technical specifications.

The flexibility of HR is the priority that has received the most attention recently (Beltrán-Martín et al. 2013; Beltrán-Martín et al. 2008; Ketkar & Sett 2009; Wright & Snell 1998). Account is also taken here of the flexibility shown by both actual employees (their degree of multifunctionality) and by the system itself in relation to human capital's skills and behaviour. Finally, flexibility in manufacturing measures the ability to respond to changes in demand, regarding both the volume of production and the variety and range of products. Following other prior studies (Lepak & Snell 1999; Lepak & Snell 2002; Weir et al. 2000; Youndt et al. 1996), we assume that a firm may pursue several of these goals at the same time in any one of its functional areas.

Achievements are each function's outputs, as they reflect the degree of accomplishment of the set objectives. Achievements may therefore be orchestrated in the same terms as objectives; in other words, we may speak of the extent to which the objectives of cost, quality or flexibility have been achieved in the HR or manufacturing systems.

As mentioned earlier, our model focuses on objectives and achievements. This approach, moreover, also enables us to construct a like-for-like measure of fit for each one of the

components or levels of the system studied. On the one hand, fit in objectives is defined as the degree of agreement between the two areas as regards the importance given to equivalent functional objectives (i.e., there is fit in objectives if the HR and manufacturing functions place the same emphasis on each one of the strategic priorities of costs, quality or flexibility). On the other hand, fit in achievements is defined as the degree of correspondence in the two areas as regards the attainments made in the equivalent functional objectives. This last consideration therefore reflects interfunctional synergies and a more efficient use of both productive and human resources. Our work analyses the strategic consistency between the two functional areas, breaking it down into these two constructs.

MODEL AND HYPOTHESES

The first step toward horizontal fit involves selecting competitive priorities. Each and every one of the links in a firm's entire value chain has to uphold the same priorities (or at least equivalent ones adapted to each function). Fit in objectives between HR and manufacturing may thus be understood as the outcome of a similar interpretation of the business strategy by both functions. It is an indication that functional managers understand the business strategy and have a shared vision of the rationale underpinning it; in other words, there is strategic consensus among middle management (Kellermanns et al. 2005; González-Benito et al. 2012; Walter et al. 2013). Research on strategic consensus provides empirical support for a positive effect on organisational performance (Kellermanns et al. 2011). This prior agreement among functional managers over what the priorities should be facilitates internal communication and co-operation, and prevents political and self-serving behaviour (Kellermanns & Floyd 2005). Likewise, emphasising the same priorities ensures a consistent message is conveyed to employees, which may be a source of motivation and foster their engagement with the organisation and its business strategy. Consistent messages within the HR/operations departments (and between them) enable employees to make confident attributions about

cause-effect relationships, and thereby share a common understanding of the behaviours expected and rewarded in the organisation that will positively affect organisational effectiveness (Bowen and Ostroff 2004). Therefore, fit in objectives involves greater consistency in the messages from the functional level (HR and manufacturing in our analysis), helping to build strategic commitment and leading to a more successful implementation (Dooley, Fryxell, & Judge 2000). In order to encapsulate this positive effect of fit in objectives, we propose the following hypothesis:

> *Hypothesis 1: Fit in objectives in the HR and manufacturing areas will have a positive direct impact on firm performance.*

The effective implementation of strategy also means that the objectives set for each functional area should lead to an improvement in organisational achievements. Fit in achievements involves effective coordination and the exploitation of synergies between functions, with a positive impact on firm performance.

The principle underlying synergic effects is complementarity: “the marginal returns to one variable are increasing in the levels of the other variables” (Milgrom & Roberts 1995, p.181). In other words, the development of a specific achievement in manufacturing will only effectively improve results if a similar achievement is developed in HR at the same time, and vice versa. For example, a high use of production equipment (geared towards the cost objective in manufacturing) simultaneously requires clearly defined job profiles with minimum qualification requirements for HR (geared towards the cost objective in HR) to ultimately improve productivity. In a similar vein, the supply of reliable and long-lasting high-performance products (quality objective in manufacturing) is possible not only through improvements in the production process itself, but also through a workforce with a high average skill set, focused on problem-solving and the introduction of improvements (quality objective in HR). Finally, a workforce defined by a wide range of knowledge and skills

(flexibility objective in HR) will be more effective when a firm's manufacturing strategy focuses on the provision of a broad array of products and the continuous development of new ones (flexibility objective in manufacturing).

The synergies considered will only be effective if both areas mutually support one another, allowing a greater degree of achievement of priorities. Indeed, a firm's core competencies are based on the integration of sundry functional capabilities (Prahalad & Hamel 1990). Therefore, the fit in achievements involves real coordination between departments, and allows obtaining synergies in the business, thereby improving firm performance. We therefore propose the following:

> *Hypothesis 2: Fit in manufacturing and HR achievements has a positive impact on firm performance.*

In this section, we further explore the causal priorities between the two components of horizontal fit. The question of causal order between objectives-achievements fit may provide an important insight for gaining a better understanding of the fit-performance relationship.

We posit that an initial condition for a fit in achievements is the prior existence of consistency in the objectives to be pursued. First, fit in objectives (i.e., functional managers share a common language) favours free-flowing communication, and the development of organisational routines that foster tacit coordination (Kellermanns et al. 2008): each functional manager acts independently, but in a way that is consistent with the actions of others (Amason 1996; Floyd and Wooldridge 1992). Consistency may also strengthen functional managers' commitment to continuous improvement: HR managers trust that their initiatives within their department will be both backed and endorsed by the measures taken in the production department, and will therefore be more effective. Likewise, consistency in encouraging equivalent objectives usually involves similarities in the patterns of resource allocation across functions, i.e., the way in which managers make critical resource allocation

decisions (Harrison, Hall, & Nargundkar 1993). Similarities in goals and resource allocation decisions should improve the effectiveness of co-ordination mechanisms (e.g., task forces committees, liaison roles, planning processes) (St. John & Rue 1991) and lead to the more successful transfer of skills, knowledge, and experience (Harrison, Hall, & Nargundkar, 1993). Finally, sharing language, commitment and patterns of resource allocation can build up the firm's core capabilities, affecting business processes that are critical to success across multiple stages of the value chain (Stalk, Evans, & Shulman 1992), and which arise from the integration of individual functional capabilities (Prahalad & Hamel 1990).

Thus, fit in objectives is a necessary (albeit insufficient) condition for fit in achievements. Besides the direct effects that fit in objectives has on organisational performance (summarised in H1), there is also an indirect effect because it facilitates the fit in achievements. In other words, it seems that fit in objectives must take place first and then be followed by fit in achievements if there are to be positive effects on organisational performance.

In short, horizontal fit (combining both objectives and capabilities) is beneficial because it favours a better climate of understanding and mutual commitment in the search for competitive goals; it facilitates efficient and swift coordination in decision-making, and leads to the exploitation of synergies across functions. We therefore formulate the following hypothesis:

> *Hypothesis 3: Fit in achievements (between manufacturing and HR functions) mediates in the relationship between fit in objectives (between manufacturing and HR functions) and firm performance.*

Effect of dynamism in the environment

Our third goal is to analyse the effect the environment has on the horizontal fit-performance relationship. Besides its relevance for organisational literature in general (Dess & Origer

1987), prior research on strategic fit has shown that the alignment of a firm's competitive priorities with its external environmental conditions enhances organisational performance (e.g., Venkatraman 1990; Venkatraman & Prescott 1990; Zajac et al. 2000; Walter et al. 2013), calling for studies on fit that examine both external and internal processes (Venkatraman & Camillus 1984). Specifically, we examine the potentially moderating effect of environmental dynamism -defined as the variance in the rate of market, industry and regulation change (Robert Baum & Wally 2003)- on the relationship between both types of fit, that is, fit in objectives and achievements, and organisational performance. Environmental dynamism refers to the degree of contextual instability and turbulence. Although dynamism has often been considered alongside munificence and complexity, with the three generic dimensions characterizing the organisational task environment (Dess & Beard 1984), it has received the most attention in empirical research (Boyd & Gove 2006). Environmental dynamism is also the contextual variable more widely explored as a moderator of the consensus-performance relationship (Dess & Origer 1987; Homburg et al. 1999; West & Schwenk 1996; Kellermanns, et al. 2011), so its incorporation requires analyzing a moderate mediation model.

Although there is widespread agreement on the positive effects of fit in general terms, the effects of horizontal fit are unlikely to be the same across different levels of dynamism.

There are major trade-offs in the attainment of horizontal fit: it may increase efficiency in the implementation of strategy, but it may also reduce the speed and flexibility of the response to changes in the environment (Homburg et al. 1999). This would be especially costly in highly volatile environments. In such contexts, as the environment is in constant flux it will require organisations to continuously establish new competitive priorities to keep up, and there is more likely to be a misalignment with the environment. Although the firm succeeds in its horizontal fit, it is pursuing competitive priorities that are ineffective for its environment, and

the implementation efficiencies attributed to this horizontal fit are likely to have less effect on organisational performance (Walters et al. 2013).

Likewise, it is more difficult to provide coordinated responses when changes are frequent and unpredictable. The need to adapt leads to changes that are unlikely to be implemented at the same pace across all functional areas, with the ensuing temporal mismatches in competitive priorities pursued by different functional stages. Thus, dynamic environments make it less likely and more difficult to maintain a high horizontal fit. Finally, an over focus on the attainment of fit may slow adaptation: it impedes functional managers' ability to consider new alternatives and respond to unforeseen events (Priem 1990). In sum, the search for horizontal fit in dynamic environments may inhibit the necessary flexibility, offsetting the beneficial effects.

Nevertheless, there are also arguments to suggest that horizontal fit has only a minor impact on performance in stable environments. The ease with which acceptable levels of fit are reached in these scenarios may place all firms in the same boat, and turn fit into no more than a minimum requirement for competing. By contrast, and in spite of volatile environments, the few firms with good levels of fit will have a differentiating factor as regards their competitors, whereby the advantages of aligning functional achievements will be greater.

In short, there is evidence to show that dynamism affects both the advantages and the disadvantages of fit, although it is not clear where the greater weight lies. Accordingly, and in order to shed some light on this matter, we formulate the following alternative hypotheses:

> *H4a: Dynamism in the environment reduces the impact of the horizontal fit between HR and manufacturing on firm performance.*
>
> *H4b: Dynamism in the environment increases the impact of the horizontal fit between HR and manufacturing on firm performance.*

METHOD

Data

The target population in this study consists of Spanish industrial firms with more than a hundred employees that operate in five sectors: Food and Kindred Products (SIC 20), Fabricated Metal Products… (SIC 34), Transportation Equipment (SIC 37), Chemicals and Allied Products (SIC 28) and Industrial and Commercial Machinery and Computer Equipment, and Electronic and other Electrical Equipment and Components, except Computer Equipment (SIC 35-36). According to our study objectives, an essential requirement was that the target population should be composed of companies with a high headcount, whereby they have a fairly developed HR function, and specifically an HR manager to whom we can address the questionnaire. This led us to focus on industrial companies with more than a hundred employees. We then decided to focus on a limited number of industrial sectors so as to avoid excessive heterogeneity. Finally, the reason we have chosen these five sectors is that they have the largest number of companies in the reference population (Spanish industrial companies with more than one hundred employees), and altogether they represent 50% of that population. Based on the Iberian Balance Sheet Analysis System (SABI) database from Bureau van Dyck, a total of 1140 firms were identified with these characteristics in each one of the aforementioned industries: 400, 216, 207, 168 and 149, respectively.

Data were gathered through two online questionnaires addressed via the *SurveyMonkey*® platform to the HR manager and the manufacturing manager, respectively. Using self-reported data gathered from the corresponding managers is a common practice in the organisational management field, especially in those studies addressing the measuring of the business strategy (Snow & Hambrick 1980). A subjective measure of performance allows to identify firms' achievements and results compared to those of their competitors. Moreover, self-reported data are suitable to obtain information on variables of a behavioural or

interpretative nature (i.e., we are looking for the managers' perception, the importance they attribute to certain issues…), and self-report questionnaires can be easily administered to large samples (Hoskin 2012), especially if we use survey platforms like the one mentioned. However, the use of self-reporting questionnaires entails a series of risks that can affect their validity, such as those related to issues of honesty, understanding the questions, or different interpretations of the rating of the scale (Hoskin 2012). A self-report method also suffers from judgemental biases, such us a central tendency or halo effect (Cascio & Aguinis 2005); inaccurate recall or bias due to social desirability (Leggett et al. 2016)[3], or other biases derived from question or questionnaire design, respectively (Choi & Pak 2005).

In order to address these issues, we follow the recommendation of Bou-Llusar et al. (2016) to "gather data from multiple informants" (HR and manufacturing managers). Moreover, according to Wright et al. (2001), we also chose "the best informed raters based on their position in the firm" (Bou-Llusar et al. 2016, p.658) to provide information about their respective function (inquiring about the priorities of a certain function by specifically asking the manager of that function).

Moreover, these questionnaires were reviewed by professional colleagues and by 27 firms in order to identify and remove any wording that might be considered ambiguous or confusing. Prior to their delivery, a phone call was made to each firm to identify the heads of HR and production, and request their collaboration. Once positive contacts had been made (527 firms, 46.22%), the managers were immediately sent a personal email invitation with the link for answering the online questionnaire. If no answer was received within the following three weeks, a further phone call was made to the firm and, if necessary, the email invitation was resent, and the questionnaire was even made available in some other format of the

[3] The risks of self-reporting have been more widely studied from a psychological point of view (Schoorman & Mayer 2008; Church 1997; Zedeck & Cascio 1984) in the field of performance management and within the framework of studies in which the individual is the unit of analysis (Cascio and Aguinis 2012).

interviewee's choice. This reminder procedure was used at least twice for each firm that did not answer. The outcome of this process, held between March and June 2015, was that 144 firms answered the questionnaires in full (12.63% response rate). It should be noted that the study's methodological design made it more difficult to record a high response rate, as an answer was required from two interviewees in each firm.

We also conduct an analysis to address the non-response bias, and another to consider the common method bias, as we explain below. The Levene's test was conducted to address the non-response bias, revealing that there are no differences regarding the variance of different objective variables, such as certain financial and descriptive variables (i.e., ROE, ROI, ROA, profit margin, headcount, age…) between the firms that answered the questionnaire and those that did not. Moreover, T-tests were conducted for these variables between respondents and non-respondents, with no rejection whatsoever of the hypothesis of the equality of means, indicating that the non-response bias is unlikely to affect our data.

As an additional analysis for studying the non-response bias, we repeated two separate tests, this time with the questionnaire variables and comparing different subsamples according to the time of the response. The analyses allow us to conclude that there are no significant differences between the 25% of firms that responded first and the 25% of firms that responded last.

In order to assess the probability that the results are affected by common-method variance, we used the Harman single factor post hoc test, which revealed that the data do not correspond to a single dimension. This suggests that this bias does not pose a major threat here.

Metrics

Fit in objectives

The HR managers were asked to use a seven-point Likert scale (from 1–not at all– to 7–a lot) to rate how important the 17 items contained in Table 1 are. The first four refer to the general objective of reducing costs, the next seven to the quality objective, and the six last ones to the flexibility objective. The results of the confirmatory factor analysis (CFA) shown in the same table reveal a close fit between each group of items and a single dimension. The mean of each group of items was then calculated for each firm k, obtaining the corresponding importance indices for the cost, quality and flexibility objectives in the HR function ($ICostHR_k$, $IQualityHR_k$ and $IFlexibilityHR_k$).

Likewise, the manufacturing managers were asked to use the same scale to rate the importance of the 13 items contained in Table 2. The first four refer to the cost objective, the next five to quality, and the last four to flexibility. In this case, too, the results of the CFA reveal a good fit to a three-dimensional structure, whereby the mean of each group of items was then calculated for each firm k, obtaining the corresponding importance indices for the cost, quality and flexibility objectives in the production function ($ICostPROD_k$, $IQualityPROD_k$ and $IFlexibilityPROD_k$).

The fit in objectives refers to the extent to which both functional areas pursue the same ones, so an index was created to measure the deviation between the profile of the objectives in the production function and the same profile in the HR function. This index is expressed as follows:

$$FitObjetives_k = (7 - \left| ICostHR_k - ICostPROD_k \right|) + \\ + (7 - \left| IQualityHR_k - IQualityPROD_k \right|) + (7 - \left| IFlexibilityHR_k - IFlexibilityPROD_k \right|)$$

This means that a closer fit (smaller difference in the importance given to the same objective by both functions) corresponds to a higher value of that index.

Insert Table 1 here

Fit in achievements

A similar procedure was used to the one for measuring the fit in objectives. The HR managers were asked to use a seven-point Likert scale (from 1 –well below competitors– to 7 –well above competitors–) to rate the achievements made regarding the 17 items contained in Table 1. A CFA was conducted, and its results, which are also shown in the table, reveal a good fit between each group of items and a single dimension. The mean of each group of items was then calculated for each firm k, obtaining the corresponding achievement indices for the cost, quality and flexibility priorities in the HR function ($CCostHR_k$, $CQualityHR_k$ and $CFlexibilityHR_k$).

Insert Table 2 here

Likewise, the production managers were asked to use the same scale to rate the achievements in the 13 items contained in Table 2. In this case, too, the results of the CFA reveal a good fit, whereby the mean of each group of items was then calculated for each firm k, obtaining the corresponding achievement indices for the cost, quality and flexibility objectives in the production function ($CCostPROD_k$, $CQualityPROD_k$ and $CFlexibilityPROD_k$).

These indices were used to build an overall index of fit in achievements according to the following expression:

$$FitAchievements_k = (7 - \left| CCostHR_k - CCostPROD_k \right|) + \\ + (7 - \left| CQualityHR_k - CQualityPROD_k \right|) + (7 - \left| CFlexibilityHR_k - CFlexibilityPROD_k \right|)$$

Performance

Firm performance has been conceptualised in a multidimensional form by strategy theoreticians (Venkatraman & Ramanujam 1986) and by researchers in the field of HR (Dyer & Reeves 1995), whereby we consider two different forms of business performance – commercial and financial. Commercial performance has usually been considered an antecedent of financial performance (González-Benito & Suárez-González 2010). The managers polled were asked to use a seven-point Likert scale (from 1 –lowest– to 7 –highest–) to rate their performance as regards their competitors in the different aspects contained in Table 3. The first five items refer to commercial performance, and the next three to financial performance. As we have two respondents per firm, the measurement of both types of performance was based on their average score for each item. The results of the CFA shown in Table 3 reveal a good fit between each group of items and a single dimension, and so they ratify the convenience of distinguishing between commercial and financial performance.

Insert Table 3 here

Dynamism

The managers polled were asked to use a seven-point Likert scale (from 1 –not at all– to 7 –completely–) to rate the extent to which the situations described in each one of the items in Table 4 reflected their firm's environment in recent years. The results of the CFA shown in the table, based on the average scores of the two respondents in each firm, reveal that all the items fit a single factor. The average score for the four items was therefore used as the mean for dynamism.

Insert Table 4 here

Analysis

The hypotheses were verified by applying structural equation modelling for estimating the model shown in Figure 2. Confirming Hypothesis 1 means the fit in objectives has a direct effect on performance, as Figure 2 a) shows. Confirming Hypothesis 2 means the fit in achievements has a significant effect on performance. Confirming Hypothesis 3 means both the fit in objectives' effect on the fit in achievements and the fit in achievements' effect on performance are significant (see Figure 2). Hypothesis 4 was verified by estimating the same model in two subgroups: one formed by firms whose environment records above-average dynamism (67 firms), and another formed by firms whose environment records below-average dynamism (77 firms). Confirming Hypothesis 4a means the effects of the different fits on performance are significantly weaker in the group with high dynamism than in the one with low dynamism, while confirming Hypothesis 4b means that the effects of the different fits on performance are significantly stronger in highly dynamic firms. Moreover, Table 2 shows the correlations between all the constructs used in our analysis.

Insert Table 5 here

RESULTS

Effects of both fits on firm performance

Figure 2 shows the results of the estimation of the proposed model. We first ran a complete model that allows us to test our first three hypotheses, and which contains direct and indirect effects (Figure 2a). This shows that the effect of the fit in objectives on performance is not significant. Hypothesis 1 is not therefore supported. According to the same complete model, Hypothesis 2 would not receive support either. However, the level of confidence in confirming a direct effect of fit in objectives in the complete model leads us to perform an additional analysis, specifically a bootstrapping analysis to identify which model (fully or

partially mediated) fits the data better. This analysis allows us to conclude that the model with a better fit is that of complete mediation (see Figure 2b). The $\chi 2$ test reveals significant differences with the structure of the observed data. Nevertheless, this is normal due to the major assumptions it involves, and because it does not take into account the model's degrees of freedom (Hoyle 1995). Accordingly, use is often made of the relative $\chi 2$ proposed by Wheaton et al. (1977), that is, the ratio that divides the value provided by the $\chi 2$ distribution by the number of degrees of freedom. This measure, which is very close to 2, is indeed satisfactory. The RMSEA (0.062), CFI (0.935) and TLI (0.912) indices also record levels deemed to be adequate (Chau 1997; MacCallum et al. 1996).

Moreover, the model was estimated again including two control variables – firm size and age. The results provided by this modified model do not differ from those provided by the original one, which supports its robustness.

The model with the best fit shows that the effect of fit in achievements on performance is significant (0.234, $p<0.01$), supporting Hypothesis 2. To test Hypothesis 3, we look at the effect of fit in objectives on fit in achievements in this model (0.24, $p<0.05$), and the effect of fit in achievements on performance (0.22, $p<0.05$), which support Hypothesis 3. We also observe that the standardised coefficient for the direct effect of fit in objectives on commercial performance is 0.16 ($p<0.1$). This accounts for a complete mediation of fit in achievements in the relationship between fit in objectives and performance.

Insert Figure 2 here

Impact of dynamism in the environment

Figure 3 presents the results of the model's estimation in the two subgroups considered according to the dynamism of the environment in which the firms are competing (high and

low dynamism). Regarding the subgroup of low dynamism (77 firms), neither fit has a significant impact on performance, either directly or indirectly. In turn, the subgroup of high dynamism (67 firms) shows that the relationships between fit in objectives and fit in achievements, and between the latter and both performances, are significant and positive. These relationships are stronger for this subgroup than for the one of low dynamism. These effects provide clear support for Hypothesis 4b. Furthermore, the results show that mediation is complete in dynamic environments, as the direct impact of fit in objectives on performance is not significant.

Insert Figure 3 here

DISCUSSION OF RESULTS

Effects of both fits on firm performance

The results described indicate that the fit among HR and production functions is positively related to organizational performance. However, the form of this relationship is such that fit in objectives is related to performance through the mediating effect of fit in achievements. Our results thus points to the prominent role of both components of horizontal fit that we distinguish, fit in objectives and fit in achievements, in this relationship and the existence of a causal connection between them. The positive effects of horizontal fit can be seen as a sequential process in which (1) fit is first accomplished regarding the strategic priorities or goals the functional areas decide to undertake (i.e., fit in objectives) and (2) fit is then realized regarding the achievements the functional areas complete (i.e., fit in achievements).

Although we have only detected an indirect effect (i.e., mediated by the subsequent fit in achievements) of the fit in objectives, this component of horizontal fit has demonstrated to be also an important ingredient in the impact of the relationship between HR and manufacturing

functions. First, the fit in objectives facilitates the same logic in both functions that forms the basis for the development of effective synergies between them. Thus, these findings show fit in objectives as a key driver to fit in achievements to be accomplished and also place this latter fit in the centre of the relationship between horizontal fit and performance.

Second, even though a high fit in objectives may not lead to a fit in achievements, the correspondence between the objectives pursued could at least help to avoid generating achievements in conflicting objectives, in other words, those in which there is a clearer trade-off (e.g., quality vs. costs). The effect of fit in objectives in fit in achievements might be undervalued by the way we have understood a fit in achievements in this study. Our fit index is based on measuring the similarity between the profiles of achievements developed in both functions, whereby any discrepancy between these profiles constitutes a reduction in fit, without taking into account in which objectives it occurs, and that discrepancy may be more tolerable in some objectives than in others. Figure 4 illustrates this notion. A histogram is used to depict three possible profiles of achievements according to the three objectives considered. Our index of fit in achievements would record the same value if one of the functions had one of the profiles and the other either one of the other two. Yet it might well be assumed that the differences in the profiles will not be equally pernicious in all cases. For example, it may be the case that if one function in a firm has profile a) and the other has profile b) (i.e., they have different achievements in quality and flexibility) it will have fewer problems than when one function has profile b) and the other profile c) (i.e., they have different achievements in quality and cost). Fit in objectives may mean avoiding these more pernicious discrepancies without raising our index of fit in achievements.

Insert figure 4 here

Therefore, the fit in objectives lays the foundations for the development of more compatible functional achievements, although they are not exactly the same; that is, it lays the foundations for avoiding the more problematic trade-offs. The communication between functional managers (and between them and their business counterparts) does appear to inform objectives that are consistent with each other, although day-to-day work and the idiosyncrasies of each functional area have an impact on the way the achievements are finally configured, and largely determine the respective functional strengths.

This rational should be supported with future studies confirming potential direct effects. In fact, a larger sample would probably have enabled us to detect a direct effect with greater significance. However, the option of indirect effect is stronger in this study and, in fact, the one with a significant effect and whose model provides a better fit.

Impact of dynamism in the environment

The results show that dynamism has an impact on both the advantages and drawbacks of fit, and that the costs incurred for achieving fit in objectives are recouped in dynamic environments when there is fit in achievements. Figure 5 illustrates the assumptions that underpin the two alternative hypotheses in terms of costs and advantages. The reasoning behind Hypothesis 4a largely involves highlighting the increase in costs (in terms of money or time) required for a fit in objectives in highly dynamic environments. These costs will not be offset by the advantages forthcoming. By contrast, the reasoning behind Hypothesis 4b stresses that although achieving fit in objectives is costlier in dynamic environments, its advantages are also greater, as in these environments such fit, if translated into fit in achievements, constitutes a truly differentiating trait.

Academic implications

In light of the results obtained, certain implications may be made of both a theoretical and a methodological nature. Firstly, the need for fit among functions for an effective implementation of strategy has often been reported in both the academic and the professional literature, often taking it for granted, and rarely supporting it with empirical studies. Our study contributes by providing empirical results that show the positive effects of horizontal fit on firm performance, and especially between the HR and manufacturing areas.

Insert Figure 5 here

Secondly, our work provides evidence of the importance of identifying the levels of objectives and achievements when explaining the competitive role of a functional area. Progress has already been made along these lines in the functions of purchasing and production, in which González-Benito (2007) and Leong et al. (1990) have used a similar framework to explain the contribution those areas make to firm performance. This suggests that it would be feasible to extend the study to all functional areas, whereby a common set of equivalent competitive priorities could be used to identify those fits between pairs of functions that are more advantageous. Generally speaking, a methodological proposal is made here on how to identify and measure, without common method variance, the horizontal fit that lays the conceptual foundations for studying other contingent factors, as well as for adapting this model to the study of other horizontal fits.

Thirdly, acknowledging the advantages and drawbacks that the quest for fit entails in dynamic environments may rekindle the debate on this matter, and question certain preconceived notions on dynamism. Our results are consistent with the conclusions some studies have reached on the relationship between strategic consensus and results, and their interaction with variables related to the environment, such as dynamism (Homburg et al. 1999), complexity

(Ramos-Garza 2009) and, in general, external fit (congruence between competitive priorities and the requirements of the environment) (Walter et al. 2013). This last study concludes that the benefits of strategic consensus are especially important when a firm has no external fit; a situation that is much more likely to occur in dynamic environments. It is therefore in these kinds of environments where the agreement among functional managers over the choice of priorities seems to contribute to the development of consistent functional priorities, and ultimately have a clearer impact on performance. Further still, insofar as the consensus among the managers involved may be an antecedent of fit in objectives, this study may provide a plausible explanation for the inconsistent findings regarding strategic consensus and performance (West Jr. & Schwenk 1996; Bourgeois 1985; Joshi et al. 2003).

Implications for management practice

Our results have sundry implications for management policy. Firstly, they clearly reflect the importance horizontal fit has for improving firm performance, increasing the need general management has to promote reciprocal involvement in the functional strategic planning of managers in both the HR and production areas. In addition, it calls upon these managers to show a greater understanding of the key dimensions of both areas.

Secondly, it reinforces the importance of being aligned in objectives, given that this will at least help to avoid the development of incompatible or contradictory priorities. General managers should therefore ensure that functional managers understand the firm's strategy, and suitably relay it to their areas, ensuring that the specific objectives they consider important are consistent with each other. This should be of value in itself, even if the priorities with the greatest achievement are not exactly the same. Nevertheless, the greatest benefit is obtained when there is perfect fit in achievements.

Finally, managers should consider the level of dynamism in the environment in which their firm operates. Inasmuch as this dynamism is higher, the fit in objectives alone ceases to be of interest if it is not translated into fit in achievements. In these cases, making coordinated decisions that lead to fit in achievements not only stems from the degree of correspondence in objectives, but could also be the outcome of the incentives, and information provided by general management. This means a less deliberate way of aligning achievements, as functional managers will implement measures designed to further a priority whose relative importance has recently grown due to changes in the market. Nonetheless, one should remember that rapid changes are required, and functional areas need more room to manoeuvre when they act. In these cases, special attention should be paid to market research and to providing the areas with the necessary information to allow them to proceed accordingly with due diligence.

Potential limitations and future lines of research

This work has certain limitations of both a theoretical and a methodological nature that may also be understood as challenges to be overcome in future research. Firstly, we have restricted ourselves to the consideration of three competitive priorities, which have conditioned our study's results. Although these priorities have been widely used at the levels of competitive strategy and of functional studies (Arthur 1992; González-Benito & Suárez-González 2010; Youndt et al. 1996; Jayaram et al. 1999), others such as reliability or speed could be incorporated.

Secondly, the relatively small sample size used here means it has a somewhat limited statistical value, which on the one hand may have stopped us from identifying certain effects, and on the other forced us to single out only two subgroups of firms for analysing the role of dynamism. Larger samples would allow refining the results and, more specifically, working with more subgroups, and thereby pinpointing the role played by dynamism. Moreover, the

development of a theory of horizontal fit in future studies would benefit from other contextual variables besides dynamism.

Thirdly, the direct effect of fit in objectives on performance has led us to reconsider the differences in the degree of complementarity between each pair of functional priorities. A more solid platform is required for deciding where the greater trade-off or higher complementarity lies between them. From a methodological perspective, this should be reflected in a fit indicator that weights the differences between each pair of priorities in a different way, according to the complementarity explained earlier.

Fourthly, we have chosen to analyse objectives and achievements, ignoring the practices implemented in each one of the functions. The incorporation of this intermediate level into future studies would allow furthering our understanding of horizontal fit.

Finally, we have applied arguments from the literature on strategic consensus to the study of strategic fit. Nonetheless, it would be appropriate to combine both concepts in a single empirical study to analyse the different implications of, on the one hand, reaching an agreement between functional managers on the business goals to be pursued (strategic consensus), and on the other, managing to develop both functional strategies that are consistent with each other (strategic fit). This integration would also allow identifying possible relationships of mediation or moderation between the two variables, and thereby help to better understand the concept of strategic coherence within an organisation.

CONCLUSIONS

This paper provides evidence of the influence that the horizontal fit between the areas of HR and production has on firm performance. In contrast to the prevailing stream in SHRM, we have focused our attention on functional priorities or goals, rather than on HR practices; and we have done the same in the production area. What's more, we have in turn identified two

types of fit: in objectives and in achievements. This has enabled us, on the one hand, to verify the positive effects that both fits have on performance, while on the other, it has revealed a mediating effect of the fit in achievements in the relationship between the fit in objectives and performance. Finally, dynamism in the environment has been found to have a moderating effect, which has proven to be a variable that reinforces the positive effects of fit. These findings not only provide evidence on the strategic importance of horizontal fit, and specifically the fit of the HR and production functions, but also show that they constitute a first step toward understanding their nature and identifying the main variables to be considered for extracting their full competitive potential.

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Table 1. Goals and achievements in the HR function: CFA

		Goals		Achievements	
		Mean (SD)	Loadings	Mean (SD)	Loadings
Costs	High labour output	6,18 (0,921)	0,524***	5,03 (1,155)	0,381***
	Low wage levels	4,25 (1,436)	0,447***	4,08 (1,415)	0,681***
	Adjustment of employee qualification to the job's mínimum requirements	5,92 (1,045)	0,555***	4,96 (1,037)	0,237***
	Reduction in costs in HR management activities	4,85 (1,348)	0,381***	4,60 (1,161)	0,691***
Quality	High average qualification of employees	5,71 (1,023)	0,515***	4,90 (1,092)	0,733***
	Reduction in non-compliances attributed to employees	5,82 (1,001)	0,417***	4,83 (1,058)	0,790***
	Problem solving by employees	5,94 (0,859)	0,650***	4,99 (1,125)	0,737***
	Employees' engagement with their jobs	6,46 (0,844)	0,627***	5,19 (1,194)	0,714***
	Employee focus on customer satisfaction	6,28 (0,944)	0,572***	5,05 (1,276)	0,772***
	Work improvements prompted by employees	5,82 (1,001)	0,700***	4,74 (1,177)	0,703***
	Development of human capital in the firm	6,03 (0,946)	0,767***	5,08 (1,081)	0,647***
Flexibility	Breadth of employees' range of knowledge and skills	6,02 (0,912)	0,670***	5,14 (0,958)	0,752***
	Refreshing employees' knowledge and skills	6,03 (0,827)	0,666***	5,02 (0,971)	0,722***
	Employees' autonomy for organising the set of tasks performed	5,64 (1,062)	0,734***	4,75 (0,986)	0,757***
	Employees' initiative for driving change	5,69 (1,112)	0,758***	4,65 (1,119)	0,804***
	Management system's ability to assign employees to different positions or tasks according to their skills	5,67 (1,140)	0,787***	4,77 (1,222)	0,840***
	Employees' ability to adapt to new work situations	6,00 (1,003)	0,794***	5,03 (1,067)	0,761***
Goodness of fit		X^2 (p-value) = 203.990 (0.000) $\chi 2/df$= 1.789 SRMR =0.0079 RMSEA= 0.074 GFI = 0.873 AGFI = 0.634 CFI= 0.899 TLI =0.840		X^2 (p-value)= 288.587 (0.000) $\chi 2/df$= 2.488 SRMR =0.085 RMSEA= 0.102 GFI=0.819 AGFI =0.762 CFI= 0.868 TLI = 0.845	

Notes: *p <0.05; **p < 0.01; ***p<0.001

Table 2. Goals and achievements in the manufacturing function: CFA

		Goals		Achievements	
		Mean (SD)	Loadings	Mean (SD)	Loadings
Costs	Productivity of the sources (e.g., machinery and equipment)	6,57 (0,706)	0,547***	5,09 (1,077)	0,693***
	Low production costs	6,28 (1,107)	0,602***	4,77 (1,267)	0,747***
	Low volume of inventory	5,35 (1,345)	0,571***	4,44 (1,114)	0,440***
	Optimum use of production capacity	6,30 (0,886)	0,653***	5,06 (1,199)	0,660***
Quality	Product features and functionality	6,34 (0,829)	0,657***	5,44 (1,002)	0,781***
	Product durability	5,88 (1,068)	0,617***	5,35 (0,963)	0,661***
	Product reliability	6,54 (0,718)	0,760***	5,65 (0,993)	0,802***
	Product adjustment to design specifications (good finish, uniformity, etc.)	6,39 (0,749)	0,639***	5,61 (0,870)	0,783***
	Efficacy in resolving customer complaints	6,48 (0,738)	0,562***	5,65 (0,978)	0,584***
Flexibility	Flexibility for adjusting production capacity to needs at any given moment	6,50 (0,757)	0,533***	5,74 (1,069)	0,462***
	Wide range of product versions, options and accessories	5,64 (1,120)	0,535***	5,19 (1,171)	0,780***
	Ability to make changes to products according to market demands	6,17 (0,822)	0,698***	5,17 (1,219)	0,782***
	Frequent launch of new products (original with the latest specifications)	5,47 (1,322)	0,639***	4,69 (1,440)	0,701***
Goodness of fit		X^2 (p-value)= 124.04 (0.000) $\chi 2/df$= 2.000 SRMR=0.064 RMSEA= 0.084 GFI=0.881 AGFI=0.825 CFI= 0.860 TLI=0.824		X^2 (p-value)= 110.47 (0.000) $\chi 2/df$= 1.781 SRMR=0.088 RMSEA= 0.074 GFI=0.895 AGFI=0.847 CFI= 0.924 TLI=0.905	
Notes: *p <0.05; **p < 0.01; ***p<0.001					

Table 3. Performance: CFA

		Mean (SD)	Loadings	Goodness of fit
Commercial performance	Reputation and image	5,48 (0,853)	0,687***	X^2 (p-value)= 58.602 (0.000) $\chi 2/df$= 3.084 SRMR=0.042 RMSEA= 0.121 GFI=0.908 AGFI=0.825 CFI= 0.951 TLI=0.928
	Customer satisfaction	5,59 (0,709)	0,713***	
	Market share (core product)	5,10 (1,088)	0,827***	
	Growth in sales	5,00 (1,124)	0,984***	
	Successful launch of new products	4,89 (1,042)	0,940***	
Financial performance	Return on sales (ROS)	4,55 (0,882)	0,782***	
	Return on assets (ROA)	4,66 (0,872)	0,641***	
	Return on equity (ROE)	4,70 (0,909)	0,816***	
Notes: *p <0.05; **p < 0.01; ***p<0.001				

Table 4. Dynamism: CFA

		Mean (SD)	Loadings	Goodness of fit
Dynamism	The technology in our industry has changed very often	4,90 (1,053)	0,628***	X^2 (p-value)= 0.248 (0.000) $\chi 2/df$= 0.124 SRMR=0.007 RMSEA= 0.000 GFI=0.999 AGFI=0.996 CFI= 1.000 TLI=1.045
	Customer tastes and preferences in our industry have changed very often	4,85 (0,920)	0,745***	
	Our key competitors' commercial strategies/actions have changed very often	5,01 (0,905)	0,724***	
	The rules and regulations applicable to our industry have changed very often	4,83 (1,056)	0,479***	
Notes: *p <0.05; **p < 0.01; ***p<0.001				

Table 5. Correlations between the model's variables

	1	2	3	4	5
1. Alignment in goals	1				
2. Alignment in achievements	0,238**	1			
3. Commercial performance	0,175*	0,209*	1		
4. Financial performance	0,126	0,234**	0.570**	1	
5. Dynamism	0,098	-0,166*	0.131	0.073	1
Notes: *p <0.05 and * *p < 0.01 (two-tailed); Spearman's correlation coefficients					

Figure 1. HR and manufacturing systems

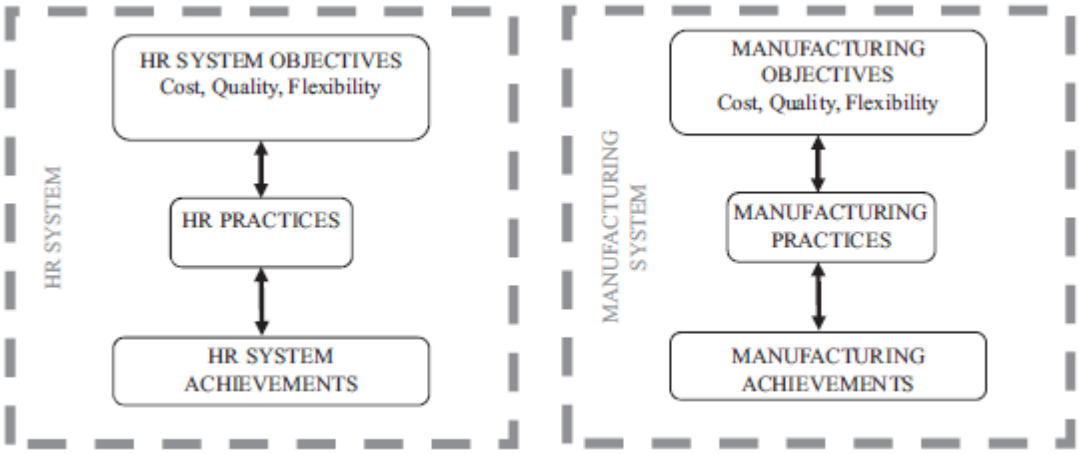
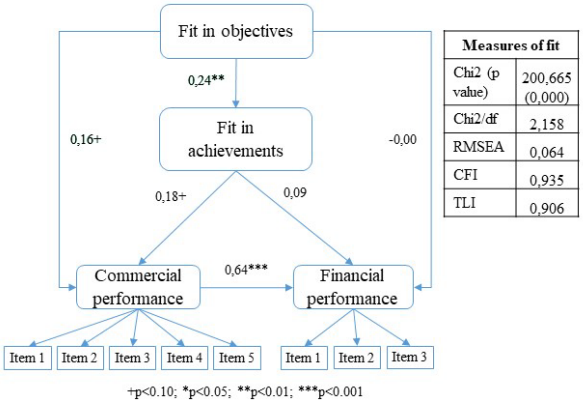
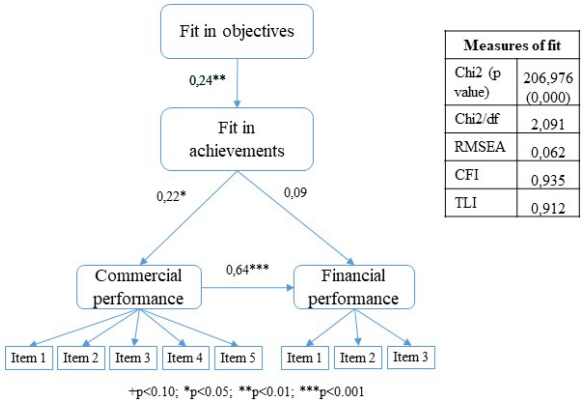


Figure 2. Model's results



Measures of fit	
Chi2 (p value)	200,665 (0,000)
Chi2/df	2,158
RMSEA	0,064
CFI	0,935
TLI	0,906

a) Direct and indirect effects



Measures of fit	
Chi2 (p value)	206,976 (0,000)
Chi2/df	2,091
RMSEA	0,062
CFI	0,935
TLI	0,912

b) Indirect effects (complete mediation)

Figure 3. Model's results by subgroups

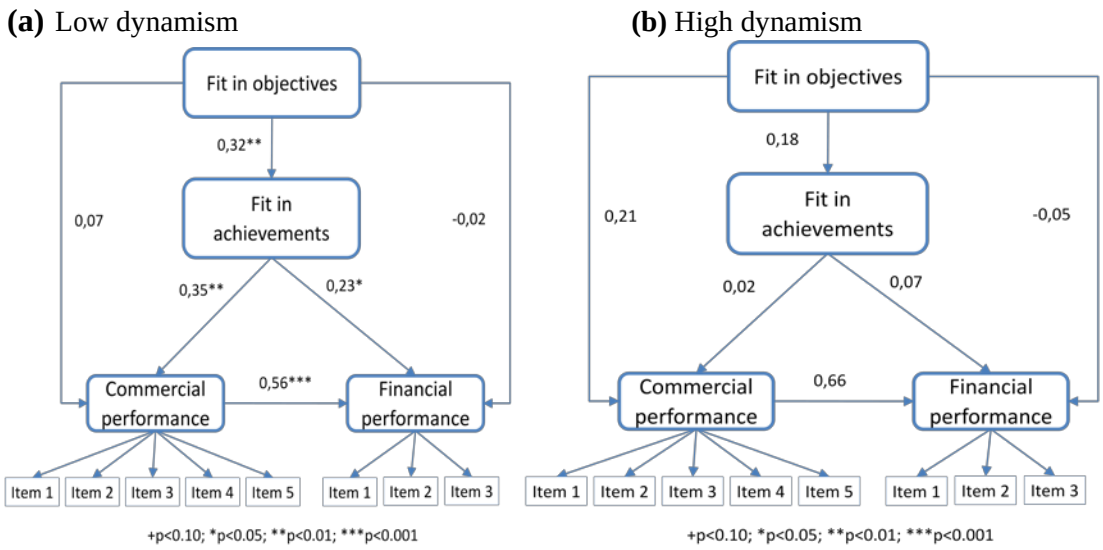


Figure 4. Examples of possible profiles of achievements in a function

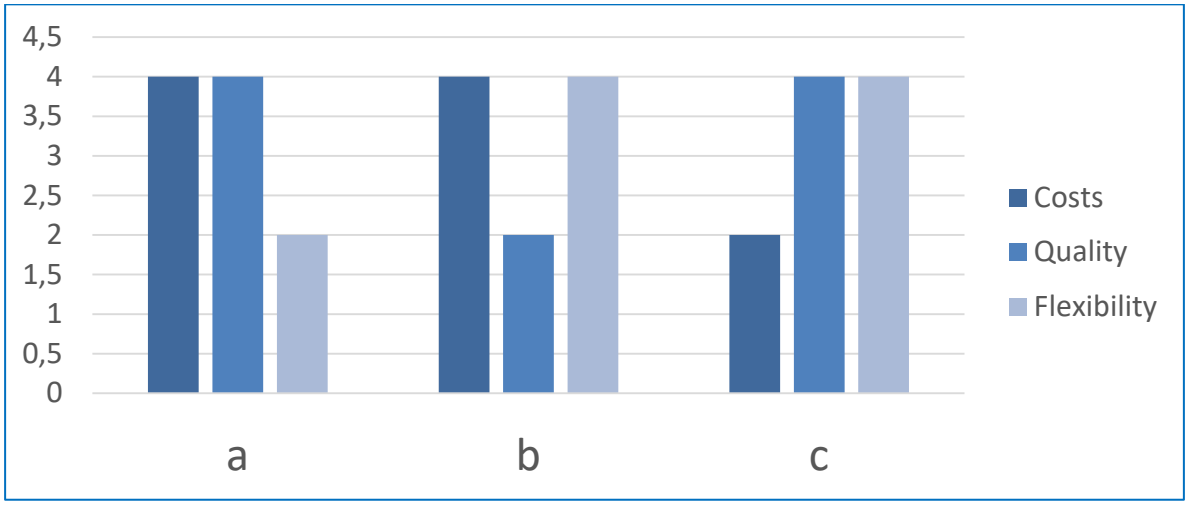


Figure 5. Costs and advantages of fit depending on the level of dynamism