

Arrighetti, Alessandro; Costa, Stefano; De Santis, Stefano; Landini, Fabio

Working Paper

Strategic Dynamism, Internal Capabilities and Firm Performance

Suggested Citation: Arrighetti, Alessandro; Costa, Stefano; De Santis, Stefano; Landini, Fabio (2024) : Strategic Dynamism, Internal Capabilities and Firm Performance, ZBW - Leibniz Information Centre for Economics, Kiel, Hamburg

This Version is available at:

<https://hdl.handle.net/10419/289628>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Strategic Dynamism, Internal Capabilities and Firm Performance

Alessandro Arrighetti^a, Stefano Costa^b, Stefano De Santis^b, Fabio Landini^a

^a University of Parma; ^b ISTAT, Italian National Institute of Statistics;

April 2024

ABSTRACT

The drivers of firm success in hyper-competitive markets have received growing attention by economic and management scholars. While earlier works paid particular attention to the analysis of firm strategic positioning in markets, most recent approaches emphasized the importance of internal capabilities. This paper combines these two views in a unified approach through a new conceptual construct, strategic dynamism, that we consider as “antecedent” of performance and “descendant” of capabilities. By using a large and unique survey carried out by the Italian Institute of Statistics we document that a) strategic dynamism explains performance differentials among firms, as captured by labor productivity growth and b) internal capabilities, measured as organizational and personnel capabilities, are important drivers of strategic dynamism. Managerial and policy implications are discussed.

JEL Classification: JEL D21 - Firm Behavior: Theory; D22 - Firm Behavior: Empirical Analysis; J24 - Human Capital; Skills; Occupational Choice; Labor Productivity.

Keywords: strategy, capabilities, performance, organizational capability, personnel capability

1 Introduction

In modern hyper-competitive markets, the sources of firm performance have become extremely blurred and difficult to grasp. Constant changes in technologies, markets and customer needs raise the complexity of the business landscape, weakening the support of traditional drivers of competitiveness. As a result, management and strategy scholars have devoted a great deal of attention to study the factors that make the difference between the firms that succeed and those that strive, with the emergence of two predominant views.

Earlier works, since the seminal contribution by Porter (1980), paid particular attention to the analysis of firm strategic positioning. In this approach, firms achieve competitive advantages by carrying out activities that differentiate their business (i.e. the mix of the products they sell and the needs they serve) from competitors' ones (Porter, 1996). Consequently, the full understanding of the drivers of firm performance requires scholars to focus on the variety of actions that firms undertake in the markets, or in other words on their competitive strategy.

Later works, however, have found the original emphasis placed on strategy alone somewhat unsatisfactory. In the presence of uncertain and volatile markets, it is argued, competitive advantages obtained through strategic positioning are only transitory and firms must sustain competitiveness through other channels (Teece et al., 1997). As a result, an alternative framework has been developed, which considers internal resources (or "*capabilities*"), as opposed to strategy, as the key antecedents of performance (Amit and Schoemaker, 1993; Dosi et al., 2000; Helfat and Peteraf, 2003). In this view (often called resource-based or capability approach), organizational resources that are valuable, rare, inimitable, and non-substitutable allow firms to achieve competitive advantages through value-creating strategies that competitors cannot replicate (Barney, 1991; Conner and Prahalad, 1996; Nelson, 1991; Peteraf, 1993; Wernerfelt, 1984 and 1995), making it possible to shed light on the very "genotype" of a business system (Costa et al, 2023). Moreover, to the extent that firms are able to integrate, build, and reconfigure these resources to address rapidly changing environments, such advantages can be sustained even in presence of volatile and uncertain market conditions (Teece et al., 1997). Therefore, according to these most recent approaches, the key to business success is not in strategy itself, but rather in the ability of firms to accumulate and combine distinctive resources, which allow them to do things in a different (and possibly better) way compared to competitors.

Although the competitive strategy and the resource-based views have been often contrasted in the literature (Priem and Butler, 2001), in this paper we make an attempt to combine them in a unified framework. In particular, from each of these approaches we borrow some features that in our view help to improve the analysis of firm performance.

From the competitive strategy view we borrow the intuition that the actions undertaken by firms in the market are indeed relevant to explain their performance. This aspect, while being not completely absent in the resource-based view, has never been fully spelled out, with the consequence that most contributions in this tradition tend to establish a direct link between capabilities and performance. By doing so, however, they neglect the intermediate steps through which heterogeneous resource endowments are effectively translated into actual market actions. In our view, the analysis of these intermediate steps is relevant as it favors a non-tautological characterization of firm capabilities that is based on what they enable firms to do and not just on the results that they obtain.

At the same time, from the resource-based view, we borrow two key insights. First, the idea that market actions are not entirely explained by contextual conditions, but rather follow from the combination of the internal resources that firms accumulate to sustain them (Hodgson, 1998). Second, the intuition according to which in modern markets competitive advantages are not built on the basis

of static positioning in given market segments but rather through continuous and dynamic re-positioning, which allows firms to adapt to contextual changes (Teece et al., 1994).

The combination of the strategy and the resource-based approaches is achieved through the introduction of a new conceptual construct, “strategic dynamism”, that we consider as antecedent of performance and descendant of capabilities. In our view, strategic dynamism consists of the variety and intensity of the discretionary actions implemented by individual firms and affecting the quantity and composition of the product supply and the geographical extension of the markets (Chatterjee and Hambrick, 2006; Hambrick and Snow, 1977; Wowak et al., 2016). Far from being associated with a static and fixed positioning in a given market segment, strategic dynamism reflects a dynamic predisposition of firms to be simultaneously active across multiple strategic domains, searching for business opportunities wherever they are and dismissing no more profitable markets segments. Theoretically, this concept emerges from the combination of different streams of research, all emphasizing that in presence of uncertain and volatile markets and technologies firms must activate continuous initiatives of repositioning, exploration and reorganization of the range of products offered and of the markets in which they operate. By doing so firms can adapt to external contingencies, thus facilitating the identification and appropriation of new business opportunities, ultimately fostering performance.

Obviously, the pursuit of strategic dynamism is not easy. The frequent engagement with strategic changes can result in significant managerial burdens, which require firms to be adequately endowed with internal resources to overcome them. In particular, we argue that firms pursuing this competitive strategy face two main types of burdens. On the one hand there are decision-making costs, which are related to the cognitive processes a firm must go through to undertake frequent and timely strategic decisions. On the other hand, there are knowledge mobilization costs that are associated with the competences that need to be deployed in order to ground decision-making on a rich and variegated knowledge base. Firms endowed with internal resources allowing a reduction of both these costs are in a better position to compete through strategic dynamism as they can appropriate a larger margin of the value it can generate.

More specifically, and directly related to burdens identified above, we argue that the pursuing of strategic dynamism is more likely in firms endowed with more valuable organizational and personnel capabilities. Organizational capability consists of intangible resources (e.g. enterprise resource planning software) employed in the coordination and monitoring of the production process and are key in smoothing out firm-level decision making. Personnel capabilities refer instead to the set of routines and working methods used by managers to motivate employees, which ensure that private knowledge and information can be easily mobilized within the organization. For a similar approach see Korherr and Kanbach (2023).

In this paper we empirically identify the sources of strategic dynamism and evaluate its drivers as well as its effects by making use of a unique and large survey, Indagine Multiscopo del Censimento Permanente delle Imprese (IMCPI), carried out by the Italian Statistical Office (ISTAT) in 2019 and covering the period 2016–2018. The survey contains rich information concerning a variety of market actions undertaken by the firms, including the set of strategic objectives pursued and achieved, the geographic extension of the markets and the range of products that are sold. It also includes information on the internal organization of the workforce and on the availability of internal assets to be used in the allocation, coordination and supervision of production tasks. On this ground, we carry out a principal component analysis on a wide set of these variables to compute indexes of strategic dynamism as well as organizational and personnel capabilities. Through a two-steps empirical analysis, we investigate first the association between strategic dynamism and standard measure of

firm performance, then the role of organizational and personnel capabilities in fostering strategic dynamism.

Overall, the empirical analysis provides strong support for our theoretical framework. At a descriptive level the degree of strategic dynamism appears to be highly heterogeneous within industries, which suggests that firm-specific drivers are more important than contextual factors in determining the propensity to adopt this kind of strategy. Such intuition is confirmed also in a multivariate analysis where strategic dynamism turns out to be positively associated with the firm-level organizational and personnel capabilities. In turn these latter, along with (and through their effects on) strategic dynamism, are positively correlated with a higher level of performance, here grasped in terms of its long-term-related form, i.e. labour productivity growth. Interestingly, this effect seems to be larger for firms of smaller size, highlighting the importance of such variables as factors that help firms overcoming the so-called liability of smallness. On the methodological ground, we adopt a multivariate, differentiated approach, firstly by making use of multiple correspondence analysis (MCA) and cluster analysis to deal with the multidimensional nature of dynamism (as well as of organizational and personnel capabilities); then by applying OLS and instrumental variables models to estimate the link between dynamism and firm performance.

The results of the paper contribute to the broad theoretical and empirical literature investigating the drivers of firm competitiveness in modern markets. A growing number of contributions argue that in presence of highly uncertain and volatile markets firms need to frequently adjust their competitive positions to defend their advantages. This has led to a variety of new concepts that have been introduced to guide managers in their dynamic decision-making process, including notions such as strategic adaptability (McKee, 1989), strategic flexibility (Brozovic, 2018) and strategic agility (Kosonen and Doz, 2010; Doz, 2020). Alongside this theoretical effort, a whole set of contributions have engaged in studies providing empirical evidence in support of these views, mainly through firm- and industry-level case studies (for a review see Weber and Tarba, 2014). Our paper integrates this voluminous literature in two ways. First, we develop a theoretical framework where we conceptualize firm performance as resulting from the combination of competitive strategy and internal resources. This allows us to be more explicit than previous contributions about the channels through which resource endowments can affect the market outcomes achieved by firms. Second, we empirically validate our conceptual framework by making use of detailed information about internal resources and market actions for a large sample of Italian firms. By doing this we give partial answer to the generalized request of empirically-grounded approaches to the study of firm strategies and capabilities (Laaksonen and Peltoniemi, 2018).

The remaining parts of the paper are organized as follows. Section 2 illustrates our theoretical framework, discussing the multifaceted nature and definitions of strategic dynamism, its link with the firm performance and the endowment of organizational and personnel capabilities; Section 3 describes the data; Section 4 illustrates the empirical strategy allowing for a measure of dynamism and its role in fostering firm performance, and discusses our results. Section 5 concludes.

2 Theoretical framework

2.1 Nature and definitions of strategic dynamism

The analysis of the strategic dynamism and the frequency of strategic changes is placed at the confluence of different lines of research. Wischnevsky (2004), recalling Levine and White (1961)

and Thompson (1967), observes that strategic change is relevant as it contributes to defining the organization's domain: every decision relating to entry and exit from markets and innovation in the products/services offered modifies the boundaries of the organization and demarcates the sphere of action of the firm. Similarly, changes in strategy are associated with changes in a firm's scope of operations and are attributable to the diversification-refocusing dimension (Klarner and Raisch, 2013). In this sense, a diversification decision corresponds to a company's entry into a new country or a new business segment, while a refocusing choices correspond to departure from a country or a business segment (Vermeulen and Barkema, 2001; Webb and Pettigrew, 1999). Strategic dynamism is measured having as reference the number of strategic changes made in a given period.

This line of research is accompanied by the approach developed in Wu et al. (2019) who identify the strategic change frequency on the basis of the number of international diversification or refocusing activities. The so-defined concept of strategic change is not limited to international contexts, but can also be applied to domestic markets (Craig et al., 2007; Craig et al., 2014; Tang et al., 2011)

In more general terms, following Zhang and Rajagopalan (2010), strategic change “refers to the extent to which a firm’s pattern of resource allocation in key strategic dimensions change over time”. The reverse of strategic change “is strategic persistence, defined as the extent to which a firm’s pattern of resource allocation in key strategic dimensions remains stable over time”.

A further qualification of strategic dynamism is offered by Larrañeta et al. (2014) introducing the category of strategic repertoire, measured as the aggregate number of a firm's competitive actions carried out by the company at a given point-in-time. Strategic changes are a component of the evolution of the company over time. Zajac and Shortell (1989) show that strategic changes are very frequent. In fact, firms that change their strategy with reference to an external change are more numerous than firms that do not. Furthermore, an organization's prior strategy can be “a very significant predictor of the likelihood the firm's strategic change in comparison with firm that avoid to change”.

As highlighted in numerous works, a dual role can be attributed to strategic dynamism: a) a tool to limit the gap between the company's production choices and the evolution of the external context and b) a means to obtain competitive benefits by changing the environmental context in which the company operates.

A particular emphasis on the proactive component of strategic dynamism can also be traced back to Miles and Snow (1978) who, elaborating a typology of entrepreneurial behavior, highlights how a category of strategic conduct attributes to the entrepreneur the role of 'prospector'. Following this approach, the firm grows substantially through the exploitation of the opportunities offered by the change of products, markets, and ways of competing. The strategic change does not stem from the firm's reaction to changes in the external context, but from the agency of the management that initiates strategic policies in advance. Added to this, as Müller and Kunisch (2018) underlined, not only do managers significantly influence strategic decisions, but they can also actively shape the environment where the firm operates. In essence, it is highlighted that strategic dynamism is not only a tool for aligning company resources with external contingencies, but also a means for changing the competitive environment.

Following this line of reasoning, it emerges that a significant component of strategic dynamism has an endogenous origin in the firm and derives from decisions elaborated autonomously by the management (Wiersema and Bantel, 1992). On an empirical level, it has been reported that, controlling for contextual factors, the intensity of the strategic change is related to management characteristics (Finkelstein and Hambrick, 1990). It follows that "some executives are more inclined to change their company strategies than are others" (Chatterjee and Hambrick, 2007).

Emphasizing managerial discretion does not conflict with the observation that the frequency of strategic changes is also determined by the nature of the interactions with the sectoral environment, with the predictability of the innovations that characterize the context in which the company operates and with the competitive processes in which companies are involved. Indeed, it has been found that strategic moves can be associated, among others, with the emergence of performance gaps (Lant and Mezias, 1992), environmental shifts (Meyer et al., 1993; Romanelli and Tushman, 1994), and performance declines (Webb and Dowson, 1991; Boeker, 1997). To these can be added the results of the contributions associated to the theory of competitive dynamics (Baum and Korn, 1996) which identifies competition as an interactive process made up of action/response dyads, with the consequence that the strategic dynamism is amplified by the competitive actions and reactions that rival firms implement in terms of “new product introductions or advertising campaigns, entry into new markets, changes in pricing policy, and relocation or redesign of facilities” (Chen and Miller, 2012).

2.2 Strategic dynamism and firm performance

Several works have shown that organizations characterized by high strategic dynamism are able to exploit competitive advantages especially in coincidence with rapid environmental changes (Tece et al., 1997). Conversely, slowness or the inability to coevolve with the environment would be detrimental to organizational survival (Rindova and Kotha, 2001; Wischnevsky, 2004). Therefore, the frequency and variety of strategic moves can influence the performance of firms. Some works seem to support this thesis. As has been pointed out by Larrañeta et al. (2014), the availability of a varied repertoire of strategic moves allows the firm to understand the needs of different market segments and to learn from the behavior of rivals and customers (Lumpkin and Dess, 2006), with a positive impact on growth and productivity. With respect to the latter, in particular, strategic dynamism improves the ability to profit from emerging market opportunities, rising the value that firms can appropriate from a given set of production inputs, including labour. Brown and Eisenhardt (1997) link successful firm performance to the ability of managers to generate a relentless pace of change concerning the modification of the range of supply and the replacement of old products with new ones. Wischnevsky (2004) observes that organizational transformations do not negatively impact the survival of companies, while prolonged periods of initial spells during which no relevant organizational changes are undertaken increase the probability of organizational failure. Haveman (1992) highlights how organizational change may benefit organizational performance and survival chances if it occurs in response to dramatic restructuring of environmental conditions and if it builds on established routines and competences. Zajac and Kraatz (1993) reach similar conclusions showing that organizational restructuring increases the probability of improving performance and firm survival.

However, there is not full agreement on the positive impact of strategic changes on firm performance. In organizational ecology, in fact, it is highlighted that a high frequency of strategic changes exposes the company to risks of “liability of newness” (Hannan and Freeman, 1984), with the consequence of weakening its organizational structure and increasing its hazard of failure. Furthermore, the greater the level of change, the greater the difficulty of implementing the transformation because high levels of strategic change require a substantial reallocation of resources and a demanding internal restructuring, whose costs are often high and not perfectly predictable, with the consequence of worsening rather than improving performance (Zhang and Rajagopalan, 2010). In this sense, a limited level of strategic dynamism would be attributable to the fact that organizations have to face extraordinary persistence forces that impede both the recognition of a need for change and its implementation. (Lant, Milliken and Batra, 1992). To solicit further investigations are the works that achieve mixed findings. This set of contributions includes the investigation carried out by Singh, House and Tucker (1986), who conclude that the extreme ecological position (which prescribes that

organizational changes lead to an increase in the failure rate of firms) does not appear to be confirmed by the collected evidence. At the same time, however, the hypothesis related to the adaptive and beneficial role of any organizational change on the firm's survival performance does not appear to be empirically supported. Similar conclusions are reached by Naranjo-Gil (2015) who finds that, if strategic changes produce positive effects in the long run, the same thing is not true for short-term performances.

In the absence of full convergence of empirical results, it is necessary to verify whether strategic dynamism is actually associated with better firm performance. The hypothesis to be tested is formulated as follows:

HP. 1 As strategic dynamism increases, firm performance improves.

2.3 The role of organizational and personnel capabilities in supporting strategic dynamism.

An important issue concerns the identification of the factors that influence the level of strategic dynamism and, in particular, the role played by organizational and personnel capabilities. The reallocation of resources, the modification of the company domain, the diversification-refocusing actions in the domestic and international markets require, in addition to the availability of material and financial resources, the access to intangible resources that can be mobilized to identify opportunities and to overcome the frictions and constraints that hold back organizational change.

This approach, in the first place, is supported by the dynamic s theory (Teece and Pisano, 1994; Pisano, 2015; Teece et al., 1997) which underlines how strategic changes and, therefore, strategic dynamism depends on the competences and capabilities which are produced internally in the firm. Furthermore, dynamic capabilities are seen as an engine of systematic change which may enhance operational efficiency and enable increased alignment with the environment. (Di Stefano et al., 2014; Peteraf et al., 2013). Following the recent survey of the empirical literature elaborated by Schilke, Hu and Helfat, 2018, the sources of dynamic capabilities are associated, among others, to the organizational structure of the firm, i.e. the way in which a) tasks are allocated, coordinated, and monitored, b) information technology is applied to store, study, retrieve, transmit, and manipulate data and c) employees are motivated and mobilized within the organization. Dynamic capabilities can be considered, therefore, a distinct subset of organizational capabilities that influences change in the firm and enables agency toward strategic change.

Secondly, in addition to the internal dynamic capabilities, the further element influencing strategic dynamism consists of an appropriate system variety (McCarthy, 2004). The capability to create strategic changes depends on the variety of the resource accumulated, matching the array of changes an environment may create. Fitness landscape theory (Ashby, 1970) shows how a high frequency of strategic changes depends on the availability of a sufficiently varied endowment of resources and skills and on the company's ability to adequately exploit this variety. In other words, having an appropriate system variety (McCarthy, 2004) allows the firm to reconfigure activities and implement frequent strategic changes with reduced costs and risks, mainly anticipating future events or proactively modifying the competitive context in which the company operates.

Thirdly, organizational change attitudes depend on the firm's ability to mobilize information and knowledge within the organization. Nahapiet and Ghoshal (1998) argue that “the special capabilities of organizations for creating and transferring knowledge are being identified as a central element of organizational advantage” and represent a condition for adopting strategies of repeated and frequent organizational change. Goll et al. (2007) claim that creating knowledge depends on the extent to which managers and other knowledge employees can combine and exchange information. Existing knowledge is proxied by functional diversity and education level (see also Hambrick and Mason,

1984). Smith et al. (2005) show that new product/service introduction is related to the ability to combine and exchange knowledge. They note that existing knowledge contributes to the creation of new knowledge, which, in turn, contributes to innovation. In addition, Boeker (1997) maintains that education is positively correlated to new ideas, boundary spanning and strategic change. Finally, knowledge and the commitment of employees facilitate the transmission of information and bottom-up exchanges represent an important means to convey information regarding the transformations of the environmental context. Yi et al. (2017) argue that, in very dynamic markets, characterized by frequent changes in the competitive moves, the ability to collect and transmit information from the periphery to the center represents a means to align the strategic choices of the company with the environment. The richer and more continuous the flow of information from the outside towards the inside of the company borders, the greater the proactivity of the company, its adaptability and speed in strategic change. The intensive use of organizational and personnel capabilities is aimed at facilitating the acquisition and transmission of information and therefore directly impacts the propensity for strategic change (Grimm and Smith, 1991). Furthermore, the existence of appropriate organizational setting, facilitate the transfer of information and ideas from the bottom to the top of the hierarchy (Mom et al., 2007; Wei et al., 2011). The result is a bottom-up learning process that strengthens the innovative orientation of management and affects strategic change.

Fourthly, the propensity for strategic dynamism is linked with the historical accumulation of internal intangible resources. Following the line of thought attributable to Penrose (1959) and Nelson and Winter (1982), the stock of accumulated knowledge can foster internal capabilities and thus actively stimulate strategic change (Kraatz and Zajac, 2001). The greater the accumulated historical competences, the stronger the capabilities that the company derives to adapt/explore new opportunities: in other words, accumulated historical competences can be seen as facilitators of internal capabilities and strategic change. This happens because firms with greater resources endowment face a wider menu of options and possess a larger "production set," which facilitates strategic change and the reallocation of resources according to new opportunities or constraints. In this sense Bowman and Hurry (1993) suggest that organization's resources contribute to strategic change as they turn out to be a bundle of options for future strategic choices. The 'resources as facilitators argument' perceives resource-rich organizations as endowed with greater adaptive capabilities and more likely to achieve performance benefits from the alteration of the mix of existing resources (Kraatz and Zajac, 2001). Consequently, organizations with larger intangible resource bases can develop better organizational and personnel capabilities ultimately leading to a greater propensity to change strategies in response to the emergence of new opportunities or in correspondence with environmental changes.

In summary, the availability of organizational and personnel capabilities represents important antecedents of strategic dynamism and deserve an in-depth investigation. On this basis, we propose to verify the following hypothesis:

H_{p2}) strategic dynamism is a function of the internal accumulation of organizational and personnel capabilities

3 Data

Over the last two decades, the demand for high-quality firm-level microdata has significantly increased, both for the purpose of measuring economic phenomena and for policy-related reasons. In order to meet such demand, European statistical offices have accelerated the design and production of new datasets able to accurately capture heterogeneities and changes within business systems, as well as other factors such as firms' competitiveness and resilience, the characteristics of most and least competitive business segments, and the profiles of growing or declining firms.

In this context, in last decade Istat undertook a new approach to the production of structural business statistics. This new approach is based on the implementation of a twofold integrated strategy in statistical production: a) massive use of administrative data for the construction of statistical registers, with extensive possibilities to link individual data to additional administrative sources and direct surveys; b) direct statistical surveys focused on economic units with multipurpose modules able to measure their organizational structures, behaviors and strategies, not detectable when using administrative sources only.

This new system guarantees also a high level of accuracy of aggregate estimates that can be largely derived from the direct aggregation of individual data. Furthermore, the consistency between the micro and macroeconomic perspectives lends solidity to micro-founded analyses of heterogeneity within various universes (e.g. economic units) in different dimensions (e.g. performance, geographical positioning, workforce utilization, international openness, remunerations).

The first wave of the Indagine Multiscopo del Censimento Permanente delle Imprese (IMCPI) was carried out by Istat in 2019. The survey involved a designed sample of about 280,000 firms representative of the universe of over 1 million units with 3 or more persons employed operating in industry and services sectors, and accounting for 24.0% of total Italian firms, 84.4% of national value added, 76.7% of workers (12.7 millions) and 91.3% of employees.

The questionnaire is structured into nine sections and retrieves information on a set of relevant issues concerning firms' choices on organization and strategies: 1) Ownership, control, management; 2) Human resources; 3) Relations between companies and other organisations; 4) Market; 5) Technology, digitalisation and new professions; 6) Finance; 7) Production internationalisation; 8) New trajectories of development; 9) Environmental sustainability, social responsibility and workplace security.

Beside this data source, we also use the Istat Frame-Sbs business register, which for each of the 4.3 million firms active in Italy provides information on structure (number of workers, business sector, location, age, belonging to a multinational group) and performance (production, turnover, value added, labour cost). The integration between the qualitative information derived from the survey and the register system enables to carry out in-depth analysis of the structure, behavior and performance of firms operating in Italy in 2015-2019, and it is particularly useful in the study of productivity dynamics. In order to concentrate our analysis on the productive segment which is more relevant for the overall performance of the Italian business system, we focus on firms with at least 10 workers, i.e. about 220 thousand units with over 9 million workers, representing 5.1% of the total companies and 55.5% of the total employment, and accounting for 92.1% of turnover and 89.8% of manufacturing added value. These units are characterized by (at least minimum) organizational size and complexity, which enable them, even in the smaller dimensional segments, to adopt innovations and react to policy stimuli.

4. The empirical strategy and findings

The conceptual framework illustrated in previous sections requires a methodological approach which allows to consider the multidimensional, complex nature of the subject. In this vein, we adopt a three-step approach. Firstly, we carry out a Multiple correspondence analysis (MCA) on the Census data to synthesize and capture the multifaceted nature of our conceptual constructs, namely strategic dynamism, organizational and personnel capabilities. Successively, we apply a cluster algorithm to classify firms along these dimensions. Finally, we estimate the link between strategic dynamism and firm performance, paying attention to the role that organizational and personnel capabilities play in fostering such link.

4.1. Multiple correspondence analysis

As far as the first step is concerned, we start by defining quantifiable proxies for our three main variables of interest: strategic dynamism, organizational and personnel capabilities. These proxies are represented by the results of MCA as a linear combination of different sets of variables from the Business census dataset.

With reference to the *strategic dynamism*, we selected the following variables:

- a. Strategic objectives pursued and achieved by the company in the three-year period 2016-18, i.e. widening the range of goods and/or services offered; access new market segments; increase business abroad/in Italy; increase inter-enterprise productive relationships;
- b. Strategic objectives planned by the company for the three-year period 2019-21, i.e. widening the range of goods and/or services offered; access new market segments; increase business abroad/in Italy; increase inter-enterprise productive relationships;
- c. Geographical extension of the firm's reference markets, i.e. sub-national, national, international;
- d. Firm's competitive strength points, i.e. pricing, product quality, diversification of products and services, product innovation.

As for the organizational capabilities the variables taken into consideration are as follows:

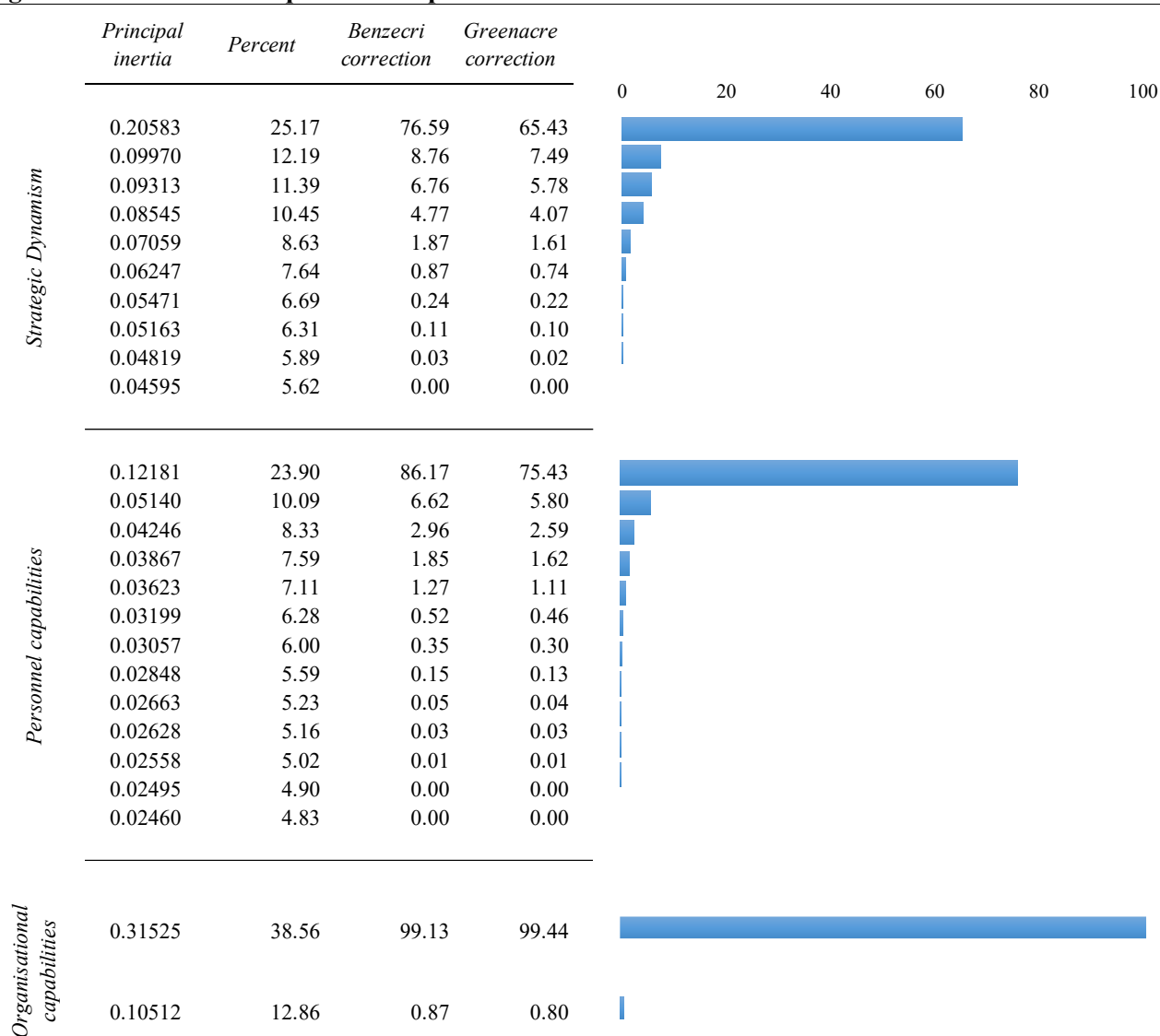
- a. The firm's capacity to quickly adjust production volumes to changing demand (a measure of flexibility in reacting to short-term changes)
- b. Adoption of ERP or integrated management systems;
- c. Access to cloud service

With regard to the personnel capabilities, we considered the following variables:

- a. Adoption of incentives based on results or overall productivity of the company;
- b. Adoption of incentives based on results or individual productivity of workers;
- c. Adoption of solutions to attract or retain high-skilled workers;
- d. Incentives for individual and group professional growth;
- e. Corporate benefits;
- f. Planning of training courses;
- g. Staff management practices;
- h. Periodic assessment of workers' skills;
- i. Mobility between functions and job rotation agreed with workers and their representatives;
- j. Flexibility of working hours;
- k. Communication between workers and owners/management to intercept signs of dissatisfaction or inefficiency;
- l. Systematic collection of opinions on production processes and proposals for improvement;
- m. Activities to promote the physical, psychological and social well-being of workers;

Figure 1 summarises the inertia and chi-square decomposition of the new synthetic variables related to strategic dynamism, personnel capabilities and organizational capabilities.

Figure 1 Inertia and chi-square decomposition



Source: Authors' elaborations on Istat data

Each profile is characterized by specific features, according to their contribution to the inertia of the three aggregates. In this context, Figure 2(a) illustrates that strategic dynamism primarily arises from a firm's capacity to operate across broad geographical areas and from its efforts to expand activities both within Italy and internationally, while also exploring new market segments. Notably, among the key attributes of this dynamism—which together represent two-thirds of the total inertia—the notable increase in international activities stands out, accounting for approximately 25% of the total inertia. Other significant factors include exporting to specific EU countries and, more importantly, serving faraway geographical areas as non-European countries and the BRICS. It also emerges a marked interest in boosting domestic activities (though not in local markets) and in branching out into new segments of the demand. This strategic approach is distinguished by the diversification of the goods and services offered, thereby widening the extensive margin of supply. This expansion is further enhanced by initiatives aimed at innovation and product differentiation. Another defining feature of strategic dynamism relates to decisions around vertical reintegration of production, marking a departure from the strategies that were favoured in previous decades, particularly by manufacturing

firms. Lastly, competitive strategies focused on pricing have a modest influence on strategic dynamism.

The quality and intensity of personnel capabilities within a company are significantly shaped by the implementation of staff management practices and strategies designed to attract and retain highly skilled workers, including offering accelerated career progression opportunities. Specifically, investments in human capital are associated with spending on a broad array of training courses. These are not limited to technical-operational skills or job-specific knowledge but also encompass areas such as teamwork, problem-solving, effective communication, and interpersonal skills. Additionally, initiatives supporting self-training and professional growth, coupled with regular assessments of employees' skills, play a crucial role.

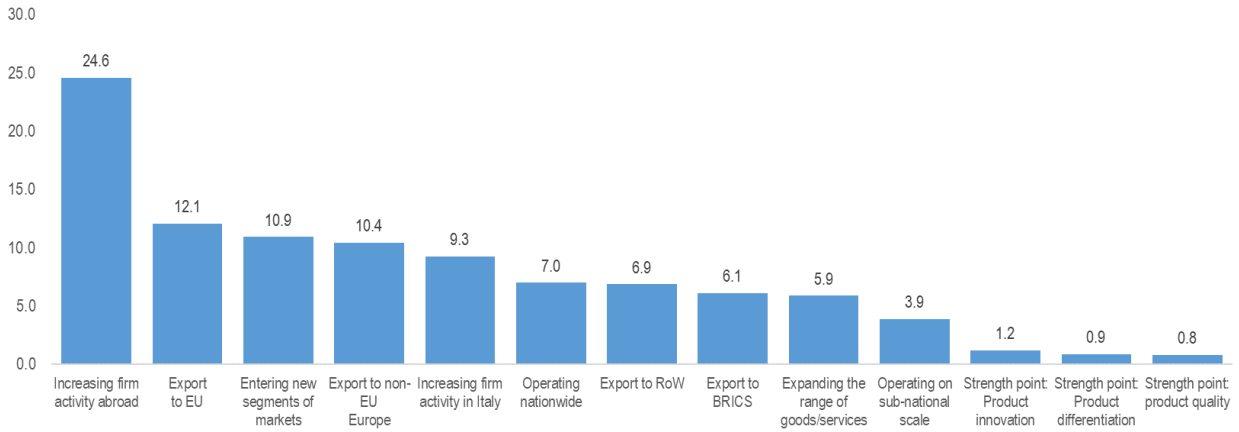
Furthermore, efforts to enhance employee engagement and participation in the management of the company are noteworthy. This includes the establishment of direct communication channels between employees and employers and the systematic gathering of feedback and critiques, alongside initiatives aimed at optimizing work organization. Notably, this involves introducing mobility across different functions and agreed-upon job rotations with employees and their representatives. These measures are complemented by a comprehensive array of individual and collective incentive schemes.

Interestingly, it is observed that when training encompasses a positive but small segment of the workforce—less than 5%—the impact turns negative. This suggests that the influence of training on human capital accumulation is not straightforward; it underscores the necessity of overcoming a minimum threshold of participant workers to achieve measurable outcomes.

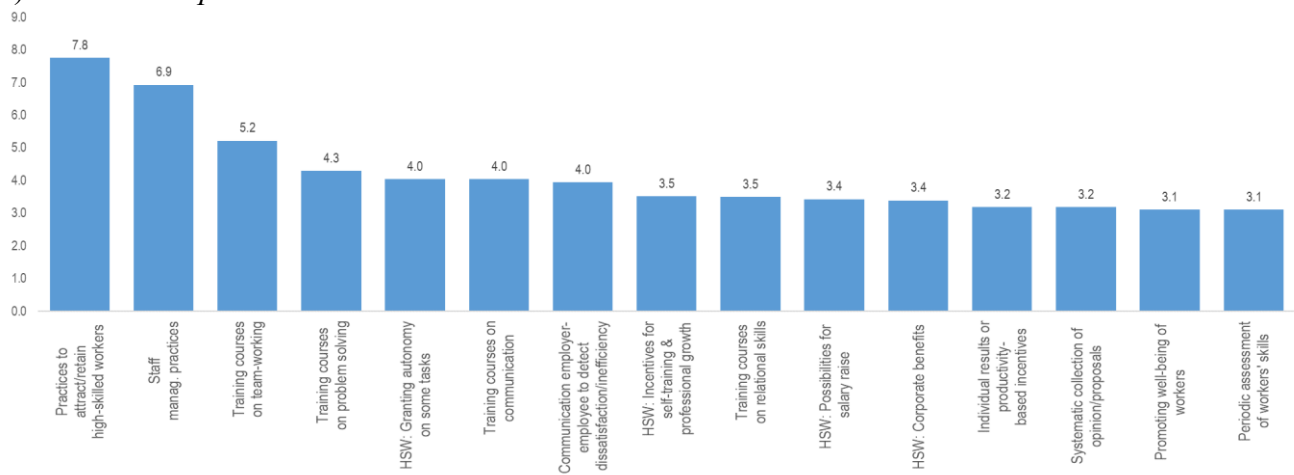
Finally, the accumulation of organizational capabilities appears to be closely linked to the investments in the management of the business activity, especially through digital-based instruments: the use of management software such as ERP, CSM, SCM accounts for almost 20% of the total inertia; besides, the use of software for specific functions – i.e. management of documentation flows, relationships with suppliers and clients, accounting, and planning – also contribute to a significant extent to the degree of a firm's organizational endowment. The link between investments in digital resources, the management of the production process and organizational capability is confirmed by the recognition of the role of the item “flexibility in production volumes” as a competitive lever.

Figure 2: Top 15 strategies contributing to the inertia of strategic dynamism, organizational and personnel capabilities

a) Strategic dynamism



b) Personnel capabilities



HSW: practices to attract or retain high-skilled workers.

c) Organizational capabilities



BMS: Business management softwares. Source: Authors' calculations on Istat data

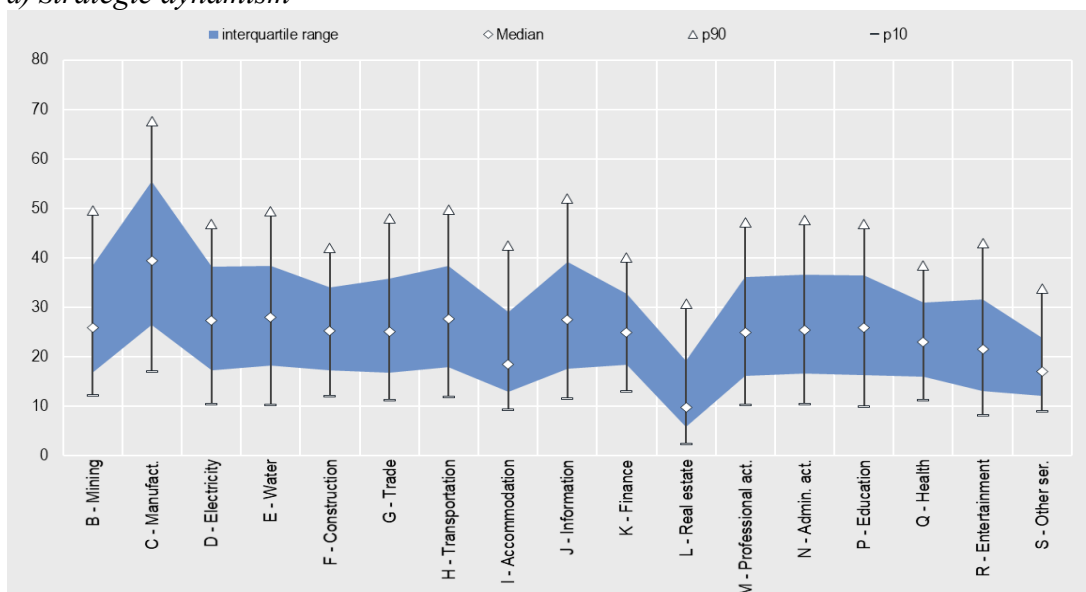
The gathered evidence underscores the heterogeneous distribution of strategic dynamism, organizational and personnel capabilities. Figure 3 illustrates, for each sector, the distribution of these three elements: with regard to strategic dynamism the median fluctuates between a minimum of 10 and a maximum of 40. Similar median values are also found in reference to organizational and personnel capabilities. The three profiles also manifest heterogeneity within the sectors. For instance, regarding strategic dynamism, in 15 sectors over 17 the distance between the highest and lowest deciles is equal to or greater than 40 points. The presence of high within sectors variance confirms that, to a large extent, strategic dynamism, organizational and personnel capabilities partially result from the subjective choices of individual companies and are only limitedly affected by factors operating at the sectoral level.

4.2. Firm clusters

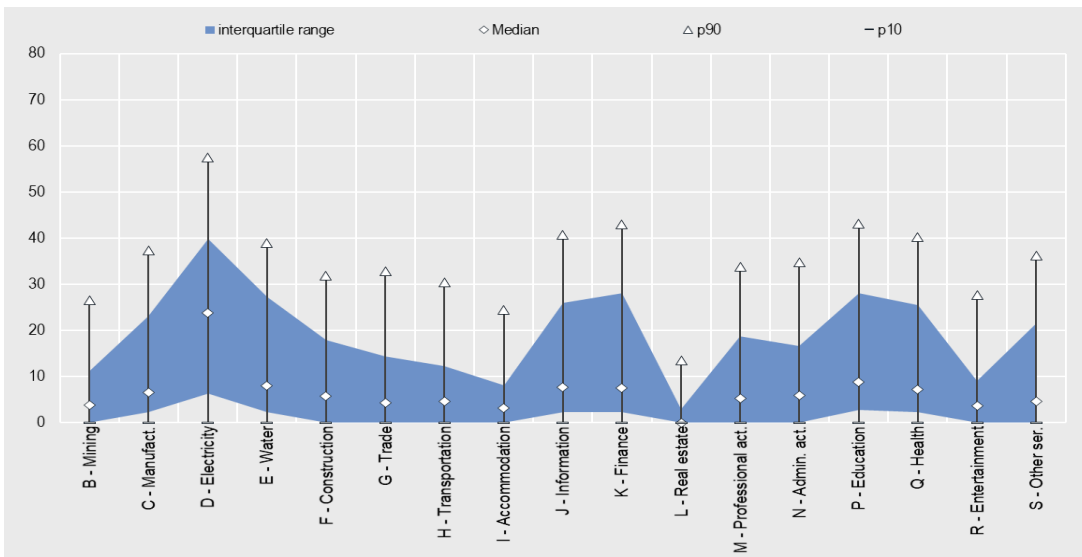
As mentioned before, the second step of our analysis consists in applying a clustering algorithm that allows companies to be classified on the basis of their level of strategic dynamism, organizational and personnel capabilities. In particular, a clustering strategy was implemented represented by: 1) identification of the data matrix and standardisation of the variables; 2) choice of classification criteria to be applied to the data (agglomerative/splitting); 3) evaluation of the result obtained, consolidation of the partitions and interpretation of the taxonomy obtained. On point 1 we have already said in the previous lines. Point 2 was preceded by an exploratory phase, carried out by means of a series of k-means, with a number of groups ranging from 9 to 2, each of which optimised with a series of random starts (in the ratio of 100). The optimal partition was made up of several groups (4/5), which were preliminarily evaluated to study the existence of data partitions of the aforementioned elements in specific multidimensional “equivalence classes”. In this way, five homogeneous classes of strategic dynamism (“Low”, “Medium-low”, “Medium”, “Medium-high”, “High”) and four homogeneous classes of organizational and personnel capabilities (“Low”, “Medium-low”, “Medium-high”, “High”) are identified. The main characteristics of the strategic dynamism – which is the most relevant variable for our purposes – are reported in Table 5. In other terms, the robustness of the clustering taxonomy was checked (that is, the capacity to maintain output coherence over a range of settings).

Figure 3: Distribution of values of strategic dynamism, organizational and personnel capabilities, by sector (standardised values)

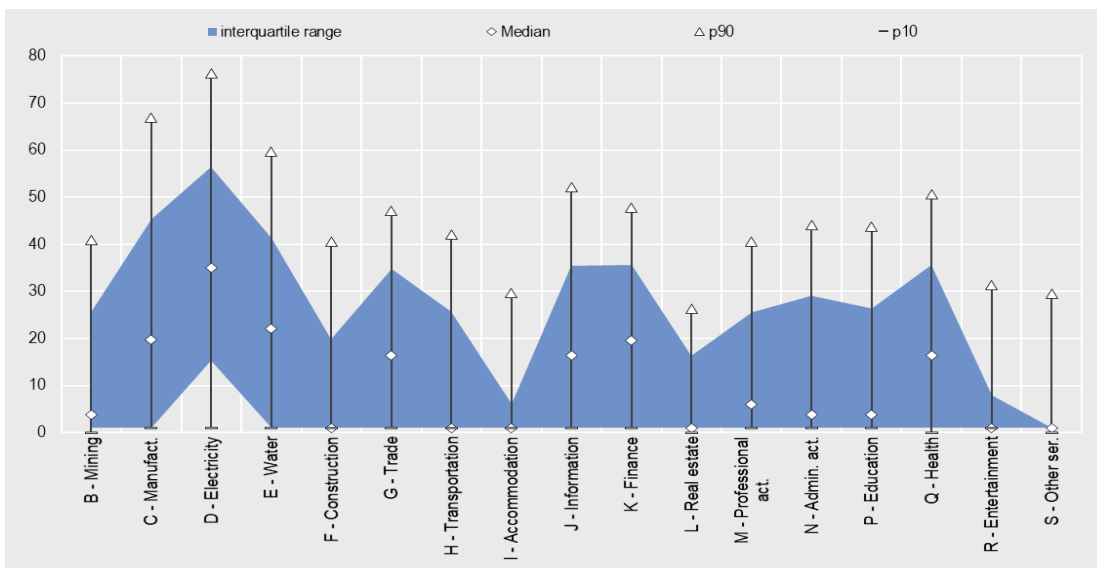
a) Strategic dynamism



b) *Personnel capabilities*



c) *Organizational capabilities*



Source: Authors' calculation on Istat data

Finally, another robustness check was introduced in order to evaluate the output coherence between distinct clustering procedures. A fuzzy clustering was performed only for the strategic dynamism, in order to: 1) evaluate the presence of “real” groups in the data, that is if the data really contains any clusters or natural groupings; 2) provide a more affordable definition of strategic dynamism “frontier” and the distance between leaders and followers throughout the membership grades assigned to each of the data points (that indicate the degree to which data points belong to each cluster). So the final strategic dynamism partition in 5 multidimensional equivalence classes is obtained.

Different classes of strategic dynamism correspond to equally heterogeneous productivity and size of the companies. In general terms, the increase in strategic dynamism aligns with an increase in per capita added value, production, and the number of employees per company. It should also be noted that the value of organizational and personnel capabilities rises as the degree of strategic dynamism among the various classes does so. This correlation supports the working hypotheses outlined in

Section 2.3, indicating a connection between strategic dynamism and the other two elements. Further examination of this relationship will be conducted in the subsequent section.

The overall picture that emerges highlights a considerable heterogeneity of the variables at the company level and a marked difference between the minimum and maximum values (see Table 1). At the two ends of the distribution, we have subsets of companies that are markedly different both in terms of strategic dynamism and in terms of organizational and personnel capabilities. The subset grouping companies with the highest values across the three indicators analysed comprises a relatively modest number of companies (10.1%), but accounts for a significant share of employment (21.1%) and added value (28.5%) overall. The opposite is observed for the subset with the lowest values of the variables examined. In this case, the number of companies is relatively high (18.2% of the total) but their contribution to the total value added (7.0%) and to employment (10.0%) is very limited. The labor productivity of these latter companies is about half that of the companies in the highest dynamism class. Even more pronounced is the difference between the two groups of companies regarding the average provision of organizational and personnel capabilities: in the class with the highest strategic dynamism, the indicator related to personnel capabilities and that related to the organizational capabilities are respectively 3.5 and 3.8 times higher than the average values of the lowest class.

Table 1: Characteristics of the classes of strategic dynamism

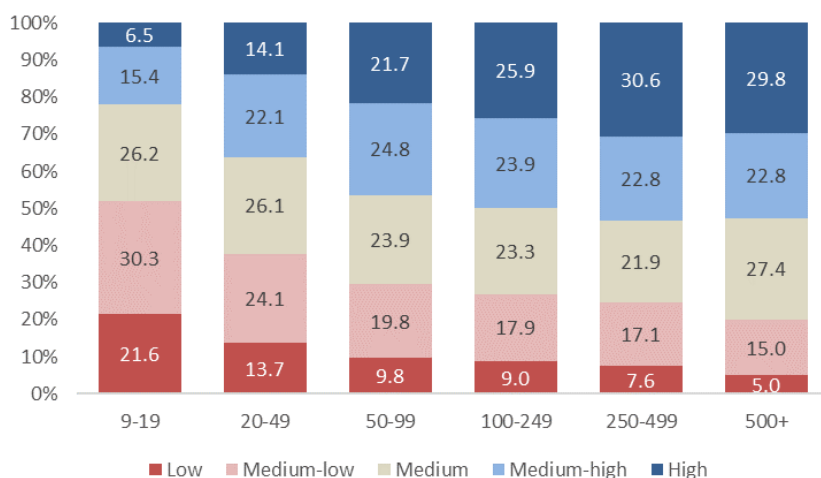
Classes of strategic dynamism	Enterprises		Workers			Value added		Productivity (value added/ workers; €)	Strategic Dynamism (average)	Personnel capabilities (average)	Organisational capabilities (average)
	N°	%	N°	%	Average	Amount (Million €)	%				
Low	37482	18.2	897859	10.0	24.0	38772.9	7.0	43183.8	12.7	7.0	11.2
Medium-low	56311	27.4	1794995	19.9	31.9	83141.2	15.0	46318.4	24.1	11.7	17.8
Medium	53154	25.9	2209535	24.5	41.6	121585.0	21.9	55027.4	36.5	17.0	24.8
Medium-high	37069	18.0	2200148	24.4	59.4	153819.3	27.7	69913.2	51.1	20.1	32.1
High (Frontier)	21392	10.4	1901998	21.1	88.9	158714.5	28.5	83460.4	69.6	25.0	42.7
Total	205408	100.0	9004535	100.0	43.8	556060.1	100.0	61753.3	34.8	15.1	23.6

Source: Authors' calculation on Istat data

An additional point to emphasize is that the group of companies with the highest strategic dynamism is not composed solely of medium or large-sized entities: although the incidence of the most dynamic classes of enterprises increases with company size (as clearly visible in Figure 4), over 20% of small companies belong to the two classes characterized by greatest level of dynamism (High and Medium-high). This evidence seems consistent with other findings in the literature, which suggest that even small companies can be associated with complex strategic orientations and a high organizational capacity (mainly directed towards other companies along the supply chain)¹. Further weakening the reliance on size in interpreting business behaviour is the observation that one in five large companies falls into the lowest dynamism categories. The link between strategic dynamism and company size is far from straightforward, and the margins for autonomous strategic decision-making within the various size classes appear to be high.

¹ See, among others, Costa et al. (2022 and 2023).

Figure 4: Classes of strategic dynamism, by size classes (firms with no less than 10 workers; %)



Source: Authors' calculation on Istat data

4.3 The link between organizational and personnel capabilities, strategic dynamism and firm performance

The third and last step of our analysis aims at empirically verifying the two working hypotheses formulated in Section 2, i.e. that a higher degree of strategic dynamism fosters better performance, and at the same time that strategic dynamism is fostered by the achievement of "adequate" levels of organizational and personnel capabilities.

On an empirical level this implies estimating the relationship between firm performance and strategic dynamism, while also measuring the link between this latter and the other two elements. In particular, we are interested in assessing whether – and possibly to what extent – the strategic dynamism is able to support the firm ability to position itself on a long-term growth path; to do so, we focus on the relationship between dynamism and the growth of firm's labour productivity (in terms of value added per worker), and we estimate it firstly through an OLS model and successively by applying IV OLS, in order to correct for possible endogeneity and reverse causality biases. Finally, as we mentioned before, in such a fragmented business system as the Italian one, characterised by an overwhelming presence of small-sized firms and a pronounced heterogeneity both in structural and performance terms, it is appropriate not to limit the analysis to the results of the entire system, but to evaluate how those results change in relation to different size classes of firms. To do so, we apply the IV OLS model not only to the overall sample, but also to some subset of it, regarding different size classes (9-19 workers, 20-99, 100-185 and 186 workers and more).²

On such bases, therefore, we first estimate an OLS model in which the measures of firm performance are related to strategic dynamism; subsequently we estimate an OLS model with instrumental variables which allows us to measure the contribution provided by organizational and personnel

² The cut-off of 186 workers has been identified by following data-driven methodology, in particular applying a cluster analysis on the logarithm of firm workers, in order to obtain: a) sample splits significant in representing the variability of persons employed; b) a subsample size consistent with the methodology applied (e.g. able to avoid singleton cases in the IV regressions).

capabilities to the achievement of a high degree of strategic dynamism and, *through this*, to the improvement of firm performance. This latter estimate is carried out with reference to the 2015-2020 period. We are aware of the cyclical peculiarities of 2020, but we chose to include this year in our time span because we are interested in assessing the structural dimension of the link between firm performance and strategic dynamism, not just its presence in particular phases of economic cycle.

The first estimate is indicated in Equation [1]:

$$y = \alpha D + \mathbf{X}\beta + u \quad [1]$$

Where D is a dummy variable indicating whether the firm has a high degree of strategic dynamism (it is on the “frontier” of the dynamism), \mathbf{X} is a matrix of firm-level structural controls (i.e. dummies relating to firm size class, sector, territory, belonging to a group, presence of financial constraints, and the level of personnel costs).

Moreover, as anticipated, to take into account also the role of organizational and personnel capabilities in affecting strategic dynamism and its effect on firm performance, we also estimate an IV OLS model, in which performance is represented by the growth of firm labour productivity, while the variable of interest – strategic dynamism – is instrumented through its antecedents: organizational and personnel capabilities. In other terms, we consider these two variables as factors affecting firm performance only through their contribution to the firm’s strategic dynamism. In our model this is represented by the differential effects of organizational and personnel capabilities with respect to the benchmark (low-endowed firms) on the probability to reach the frontier of strategic dynamism.

The new model to be estimated is, in matrix notation:

$$y = \mathbf{X}\beta + u \quad [2]$$

The matrix of regressors \mathbf{X} is $n \times \mathbf{K}$, where n is the number of observations. Some of the regressors are endogenous, so that $E(X_i u_i) \neq 0$. We partition the set of regressors into $[X_1 X_2]$, with the K_1 regressors X_1 assumed under the null hypothesis to be endogenous and the $K_2 \equiv (K - K_1)$ remaining regressors X_2 assumed exogenous.

As it is well-known, the order condition for identification of the equation [2] is that there must be at least as many excluded instruments as there are endogenous regressors, as Z_2 is common to both lists. In our case this is verified.

The dependent variable is the firm performance, measured by the growth of labour productivity, in logarithm form, in the period 2015-2020. The regressors that are assumed exogenous are sectorial and size dummies, and other firm-level controls (the same as in Equation [1]). The instruments, that are assumed exogenous (so that they do not appear as regressors in the main equation), are as follows:

- a. the three (out of four) dummies relating to the classes of personnel capabilities, with the fourth (and lowest) class taken as a benchmark;
- b. the three (out of four) dummies relating to the classes of organizational capabilities, with the fourth (and lowest) class taken as a benchmark

In doing so we have six exogenous instrumental variables which are not supposed to be correlated with the error in the productivity equation. To carry out our IV procedure, we follow the steps described in Appendix A.

The results of the OLS and IV estimates are reported in Table 6.³ Firstly, regarding the estimates from the OLS model, it is observed that high levels of strategic dynamism are indeed linked to enhanced performance levels, leading to a productivity growth increase of over 3%. However, this effect varies when the impact of organizational and personnel capabilities is adequately considered. In this context, the results from the IV estimates indicate that for the overall sample, a significant and positive impact of strategic dynamism on firm performance during the 2015-2020 period is evident: being at the frontier of strategic dynamism is associated with a productivity growth increase of approximately 29% in logarithmic terms (or 33.4% in absolute terms). Furthermore, the positive contribution of organizational and personnel capabilities to firm performance, facilitated through their influence on strategic dynamism, complements these findings. Specifically, when using the lowest classes as a reference, a significant and positive correlation emerges between strategic dynamism and the endowments of organizational and personnel capabilities: as these endowments increase, so does the likelihood of being at the frontier of strategic dynamism. This probability ranges from 2.2 to 11.5 percentage points across the three considered classes of personnel capabilities. Meanwhile, for organizational capabilities, it increases by 3.8 to 13.8 points for medium-high and high-level classes, though no significant differential effects are discernible between low and medium-low level classes. This relationship further underlines that attaining high levels of organizational and personnel capabilities generally yields a positive and escalating impact on firm performance: the productivity differential, compared to the least endowed companies, grows from approximately 0.8% to nearly four times higher in the case of personnel capabilities, and from 1.3 to 4.3 times higher for organizational capabilities.

Moreover, these results still hold for virtually every firm size class. In particular, the effect is greatest among the smallest enterprises (10-49 workers), for which being on the frontier of strategic dynamism increases firm productivity growth by 40% with respect to other, less dynamic units. This impact is noteworthy also among medium-large (100-185 workers) and large firms (186+ workers), where it ensures a 34% and 28% higher increase in productivity growth, respectively. Finally, the effect is more limited, but still substantial, for medium-small enterprises (20-99 workers), where the gain in terms of productivity dynamics is nearly one fifth. As far as organizational and personnel capabilities are concerned, their contributions to firm performance are positive as well. Also their distribution among the size classes tends to mirror the result related to the full sample, with an exception: the effect of personnel capabilities is higher for the medium-large units than it is for the small ones, especially in correspondence of Medium-low and High level of personnel capabilities

³ The same estimate has been carried out also on other, less long-term-related measures of firm performance, such as the dynamic of turnover, export and return on sales. The positive and significant relationship with the degree of strategic dynamism is confirmed. Results are available upon request.

Table 2: Instrumental Variable regressions: effects of high strategic dynamism on firm performance (a)

		Dep. var.: % change in labour productivity in 2015-2020										
		OLS	IV OLS									
			All sample		9-19 workers		20-99 workers		100-185 workers		186+ workers	
			2nd stage	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage	1st stage
The firm belongs to the frontier of strategic dynamism		0.0312** (0.0132)	0.288*** (0.0749)		0.401** (0.185)		0.215*** (0.0394)		0.338*** (0.106)		0.281** (0.116)	
Endowment of Human Capital	Medium-low	no		0.0227*** (0.00436)		0.0224*** (0.00650)		0.0205*** (0.00396)		0.0346** (0.0148)		0.0392** (0.0167)
	Medium-high	no		0.0671*** (0.00548)		0.0601*** (0.00933)		0.0731*** (0.00433)		0.0648*** (0.0141)		0.0657*** (0.0160)
	High	no		0.115*** (0.00950)		0.0904*** (0.0218)		0.119*** (0.00740)		0.147*** (0.0182)		0.121*** (0.0177)
Level of Organizational Resources	Medium-low	no		0.00404 (0.00345)		0.00510 (0.00469)		0.00385 (0.00349)		0.00728 (0.0145)		-0.0158 (0.0165)
	Medium-high	no		0.0379*** (0.00533)		0.0390*** (0.00855)		0.0404*** (0.00402)		0.0247* (0.0141)		0.0339** (0.0164)
	High	no		0.138*** (0.00764)		0.0992*** (0.0154)		0.151*** (0.00604)		0.122*** (0.0179)		0.135*** (0.0188)
<i>Controls</i>												
Size	yes		yes		yes		yes		yes		yes	
Territory	yes		yes		yes		yes		yes		yes	
Sector	yes		yes		yes		yes		yes		yes	
Internationalized status	yes		yes		yes		yes		yes		yes	
Group membership	yes		yes		yes		yes		yes		yes	
Observations		91,207	91,207	91,207	29,777	29,777	51,817	51,817	5,119	5,119	4494	4494
R-squared		0.069	0.103		0.117		0.076		0.022		0.024	
<i>[p-value]</i>												
Endogeneity test of endogenous regressors			0.0003		0.044		0.000		0.0034		0.009	
F-test of excluded instruments			0.000		0.000		0.000		0.000		0.000	
Underidentification test (Kleibergen-Paap rk LM statistic)			0.000		0.000		0.000		0.000		0.000	
Weak identification test (Cragg-Donald Wald F statistic)			0.000		0.000		0.000		0.000		0.000	
Hansen J statistics			0.446		0.668		0.278		0.4283		0.2251	

(a) The cut-off of 186 workers stems from a cluster analysis carried out on the logarithm of firm workers, in order to obtain: *a*) sample splits significant in representing the variability of persons employment; *b*) a subsample size consistent with the methodology applied (e.g. able to avoid singleton cases in the IV regressions).

* $P < 0.1$; ** $P < 0.05$; *** $P < 0.01$. Robust standard errors. Benchmark: Large, North-western, high-dynamism firms.

Source: Authors' calculation on Istat data.

5. Conclusions

Recent research and debates have shown that in environments characterized by high uncertainty, it is not the adopted strategy itself that contributes to improving performance, but rather the ability to accumulate and combine resources that enable the company to achieve extensive mobility (both geographically and in terms of the product mix) within the competitive context in which it operates. This ability can be traced back to the concept of strategic dynamism. In our view, strategic dynamism is characterized by the diversity and intensity of voluntary actions undertaken by individual companies, which influence the volume and makeup of product offerings and the geographic expansion of markets. It embodies a firm's dynamic inclination to operate in multiple strategic areas simultaneously, actively pursuing business opportunities wherever they may arise, and swiftly exiting market segments that cease to be profitable.

The frequent engagement with strategic changes can result in significant managerial burdens, that require firms possess sufficient internal resources to surmount these obstacles. We posit that the pursuing of strategic dynamism is more likely in firms equipped with more valuable organizational and personnel capabilities. The former includes intangible assets (e.g., enterprise resource planning software) utilized in allocating, coordinating, and overseeing production tasks, playing a crucial role in streamlining firm-level decision-making processes. On the other hand, personnel capabilities pertain to the set of routines and working methods used by managers to motivate employees, which guarantee the availability of high-quality private information and knowledge within the organization.

Building on these premises, we tested two hypotheses. The first examines the existence of a positive correlation between strategic dynamism and firm performance. The second hypothesis focuses on the influence exerted by the firm's inclination towards the use of organizational and personnel capabilities on strategic dynamism. Hypothesis testing was carried out through the development of specific indicators capable of approximating the key variables of the analysis. MCA (Multiple Correspondence Analysis) and clustering procedures allowed the identification of the variables that make up and characterize the level of strategic dynamism on one hand, and on the other, the accumulation of organizational and personnel capabilities, which are used in the subsequent econometric analysis.

From the study, some interesting results emerge. Firstly, as expected, strategic dynamism is positively associated with the economic performance of the firms; Secondly, endowment of organizational and personnel capabilities impact strategic dynamism: firms showing higher strategic dynamism possess higher organizational and personnel capabilities. Thirdly, the gap between firms with high strategic dynamism and those with low strategic dynamism is significant, showing a markedly higher labour productivity of the former compared to the latter. In other words, by evaluating the dynamics of productivity, the conclusion is that it is the high (low) level of strategic dynamism that positively (negatively) influences the firm's performance and this occurs to a greater extent than the impact exerted by structural variables such as size and sector. Fourthly, even relatively modest variations in organizational and personnel capabilities generate a significant impact on strategic dynamism and on firm performance. Incremental improvements, such as moving from one class of organizational and personnel capabilities to the next, result in a substantial improvement in performance. With only one exception related to moving from the lowest class of organizational resources to the immediately higher one, the evidence collected indicates that investment spikes are not necessary to generate appreciable results in terms of productivity growth. Based on these considerations, strengthening strategic dynamism does not require a radical restructuring of the priorities and structure of the firm with consequent organizational shocks: a policy of gradual increase of organizational and personnel capabilities is capable of determining positive effects on performance. It follows that scale up through

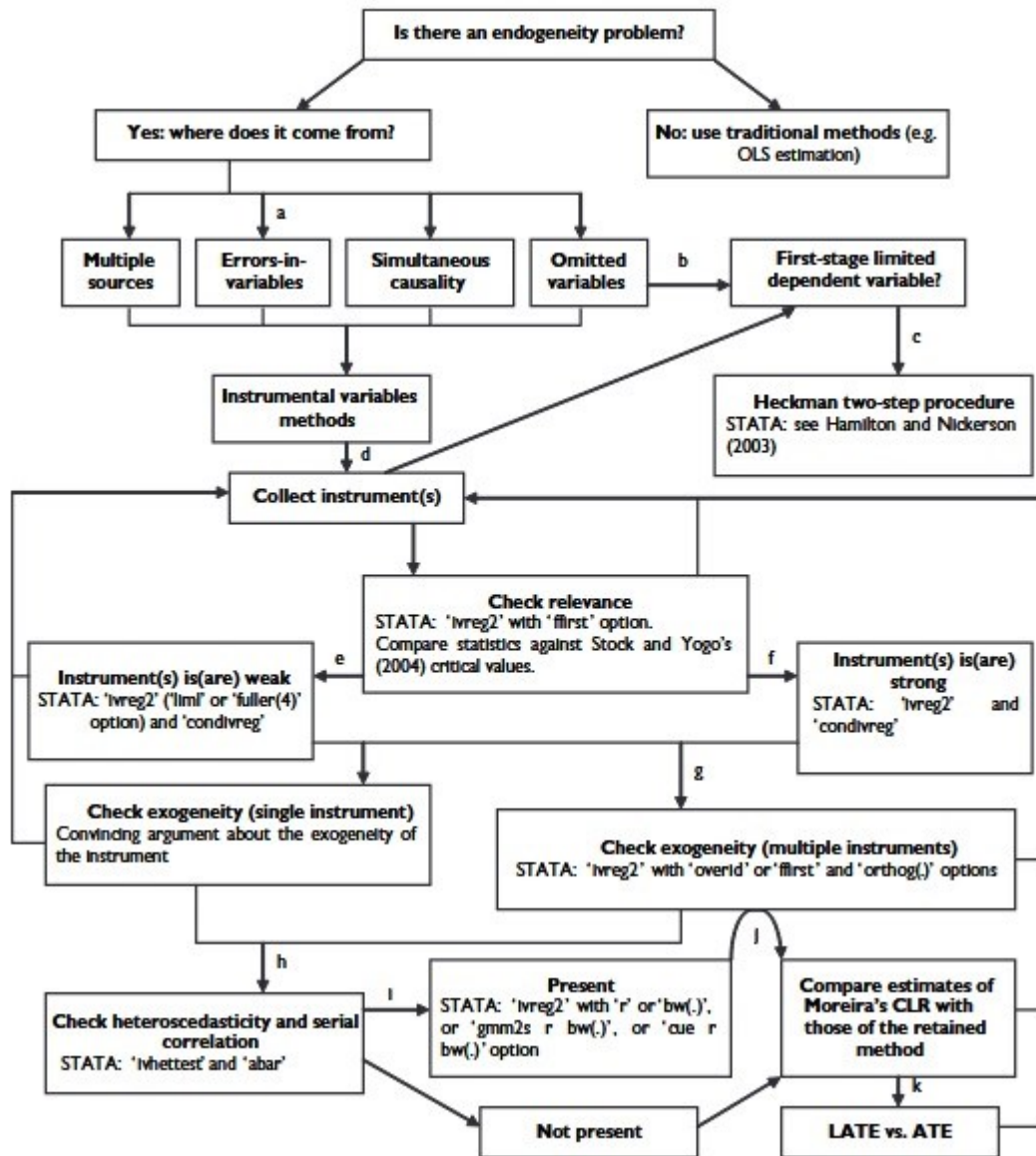
a gradual approach turns out to be a viable orientation for a wide range of firms. Fifthly, the impact of strategic dynamism on performance is particularly significant with reference to small firms, and especially to the very small ones: as size increases, in fact, the marginal return of expanding strategic dynamism continues to be positive, but decreases significantly. Therefore, the adoption of practices and policies that strengthen strategic dynamism appears to benefit small firms since in the latter the incentive and the expected benefit tends to be higher compared to large firms. From the perspective of strategic dynamism, there are therefore no hints of the presence of a significant liability of smallness, which instead often hinders the growth and upgrading of smaller firms.

Appendix A

We follow several steps in order to carry out the IV estimation of Equation [2] (see roadmap in Figure A1). Our first step is checking for potential endogeneity related to several issues. The OLS regression breaks down in the circumstance of correlation between x and u (estimation inconsistency). The correlation between x and u (or the failure of the zero conditional mean assumption $E[u|x] = 0$) can be caused by any of several factors, as represented in Figure 3. Although IV methods were first developed to cope with the problem of endogeneity in a simultaneous system, they can also address cases where correlation of regressors and error may arise for other reasons. In this case a problem of simultaneous and reverse causality may rise and, given the nature of data available (partially based on cross sectional data) we must resort to other methods, such as IV, in order to retrieve consistent estimation of the parameters of interest. The test is essentially one of whether IV methods are required to estimate the equation. If OLS estimates are consistent, they should be preferred. In this context, the test is equivalent to a Hausman test comparing IV and OLS estimates. So we perform the Hausman test⁴, that provides support for using 2SLS, indicating the rejection of the consistency of OLS.

⁴ The null hypothesis is that the OLS estimator is consistent. If accepted, we probably would prefer to use OLS instead of 2SLS.

Figure A1: Roadmap in IV estimation



As the the order condition is satisfied, we can check for underidentification problems (Kleibergen-Paap rk LM statistic). The matrix has rank= K_1 , so that the model is correctly identified. The next step is checking for the relevance of the selected instruments. The Angrist-Pischke (AP) first-stage chi-squared and F statistics are tests of underidentification and weak identification, respectively, of individual endogenous regressors. But in the special case of a single endogenous regressor, the AP statistic reported is identical to the Cragg-Donald Wald statistic (if i.i.d.) or the Kleibergen-Paaprk Wald statistic (if robust, cluster-robust, AC or HAC statistics have been requested). The F test of excluded instruments verifies the joint significance of all of the instruments. In our case they are jointly significantly different from zero. Being the special case of a single endogenous regressor, the same statistics tell us useful information about the strength (or weakness) of the instruments. “Weak identification” arises when the excluded instruments are correlated with the endogenous regressors, but only weakly. Estimators can perform poorly when instruments are weak. In the worst case, the bias of the IV estimator is the same as that of OLS, IV becomes inconsistent, and instrumenting only aggravates the problem (“The cure can be worse than the disease”, Bound et al., 1993; Jasa, 1995). Staiger and Stock (Econometrica, 1997) formalized the definition of weak instruments. Many researchers conclude from their work that if the first-stage F statistic exceeds 10, their instruments are sufficiently strong. This criterion does not necessarily establish the absence of a weak instruments

problem. But Stock–Yogo tabulations (that further explore the issue and provide useful rules of thumb for evaluating the weakness of instruments, see Stock and Yogo, 2005), based on the Cragg–Donald statistic, are only valid for and i.i.d. errors: “We are not aware of any studies on testing for weak instruments in the presence of non-i.i.d. errors. In our view, however, the use of the rk Wald statistic, as the robust analog of the Cragg–Donald statistic, is a sensible choice and clearly superior to the use of the latter in the presence of heteroskedasticity, autocorrelation, or clustering. We suggest, however, that when using the rk statistic to test for weak identification, users either apply with caution the critical values compiled by Stock and Yogo (2005) for the i.i.d. case or refer to the older ‘rule of thumb’ of Staiger and Stock (1997), which says that the F statistic should be at least 10 for weak identification not to be considered a problem” (Baum, Schaffer and Stillman, p. 490). Furthermore, two statistics (Anderson-Rubin, 1949 and Stock-Wright, 2000) that provide weak-instrument robust inference for testing the significance of the endogenous regressors in the structural equation are provided. Both tests are robust to the presence of weak instruments. The null hypothesis tested in both cases is that the coefficients of the endogenous regressors in the structural equation are jointly equal to zero, and, in addition, that the overidentifying restrictions are valid. The tests are equivalent to estimating the reduced form of the equation (with the full set of instruments as regressors) and testing that the coefficients of the excluded instruments are jointly equal to zero. In all cases, the null hypothesis is rejected.

If and only if an equation is overidentified, we may test whether the excluded instruments are appropriately independent of the error process. That test should always be performed when it is possible to do so, as it allows us to evaluate the validity of the instruments. The specification of an instrumental variables model asserts that the excluded instruments affect the dependent variable only indirectly, through their correlations with the included endogenous variables. Requirements for Z to be a valid instrument for X are:

- Relevance – Z needs to highly correlated with X
- Exogenous – Z is correlated with Y solely through its correlation with X; so Z is uncorrelated with the error in the outcome equation

The main idea behind IV is that when Z changes, it should also alter X, but not the troublesome part of X that is correlated with the error. To get the effect of X on Y we are only using part of the variation in X, the part that's driven by variation in Z.

If an excluded instrument exerts both direct and indirect influences on the dependent variable, the exclusion restriction should be rejected. This can be readily tested by including the variable as a regressor.

To test the first assumption – that the excluded instruments are sufficiently correlated with the included endogenous regressors – we should consider the goodness-of-fit of the “first stage” regressions relating each endogenous regressor to the entire set of instruments. If there is a single endogenous regressor, these issues are simplified, as the instruments either explain a reasonable fraction of that regressor’s variability or not.

To test the second assumption we can perform the Sargan-Hansen test of overidentifying restrictions should be performed routinely in any overidentified model estimated with instrumental variables techniques. Instrumental variables techniques are powerful, but if a strong rejection of the null hypothesis of the Sargan–Hansen test is encountered, you should strongly doubt the validity of the estimates. It may be difficult to find variables that can serve as valid instruments. Many variables that have an effect on included endogenous variables also have a direct effect on the dependent variable. The higher the p-value of the Sargan–Hansen statistic the better. However according to Roodman (2006), it is recommended that Sargan–Hansen p-value should be greater than 0,25. This does not invalidate other results that rejects the null hypothesis. In our case, all the regressions satisfied the test of overidentifying restrictions, with a p-value 0,2587 and 0,5106.

References

- [1] Abdi H., Lynne J.W. (2010). "Principal Component Analysis." John Wiley and Sons, Inc. WIREs Comp Stat 2: 433–59. <http://staff.ustc.edu.cn/~zwp/teach/MVA/abdi-awPCA2010.pdf>.
- [2] Amit, R. and P. J. Schoemaker (1993), "Strategic assets and organizational rent". *Strategic Management Journal*, 14(1), 33–46.
- [3] Ashby, W.R. (1970), "Self-regulation and requisite variety", in Ashby, W.R. (Ed.), *Introduction to Cybernetics*, reprinted in Emery, F.E. (Ed.) (1970), *Systems Thinking*, Penguin Books, Harmondsworth, Wiley, New York, NY, pp. 105-24.
- [4] Baum, J. A., & Korn, H. J. (1996). Competitive dynamics of interfirm rivalry. *Academy of Management Journal*, 39(2), 255-291.
- [5] Blundell, R., & Dias, M.C. (2009). Alternative Approaches to Evaluation in Empirical Microeconomics. *The Journal of Human Resources*, 44(3), 565–640.
- [6] Boeker, W. (1997), "Strategic change: the influence of managerial characteristics and organizational growth", *Academy of Management Journal*, Vol. 40, pp. 152-70.
- [7] Bowman, E. H., D. Hurry. 1993. Strategy through the option lens: An integrated view of resource investments and the incremental- choice process. *Acad. Management Rev.* 18 760-782.
- [8] Brown, S. L., & Eisenhardt, K. M. (1997). The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42, 1-34
- [9] Brozovic, D. (2018). Strategic flexibility: A review of the literature. *International Journal of Management Reviews*, 20(1), 3-31.
- [10] Chatterjee A, Hambrick DC. 2007. It's all about me: narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly* 52(3): 351–386.
- [11] Chen, M. J., & Miller, D. (2012). Competitive dynamics: Themes, trends, and a prospective research platform. *Academy of management annals*, 6(1), 135-210.
- [12] Coppi R., Bolasco S. (eds.) (1989), *Multiway Data Analysis*, North Holland, Amsterdam.
- [13] Correia S.m (2015), *Singletons, Cluster-Robust Standard Errors and Fixed Effects: A Bad Mix**, Duke University.
- [14] Costa, S., De Santis, S. & Monducci, R., Reacting to the covid-19 crisis: state, strategies and perspectives of Italian firms. *Rivista di Statistica Ufficiale*, 1, 73-107.
- [15] Costa, S., De Santis, S., Dosi, G., Monducci, R., Sbardella, A., & Virgillito, M.E. (2023). From organizational capabilities to corporate performances: at the roots of productivity slowdown, *Industrial and Corporate Change*; dtad030, <https://doi.org/10.1093/icc/dtad030>.
- [16] Crossland, C., Zyung, J., Hiller, N. J., & Hambrick, D. C. (2014). CEO career variety: Effects on firm-level strategic and social novelty. *Academy of Management Journal*, 57(3), 652-674.

- [17] Di Stefano, G., Peteraf, M., & Verona, G. 2014. The organizational drivetrain: A road to integration of dynamic capabilities research. *Academy of Management Perspectives*, 28(4): 307–327.
- [18] Dosi, G., Nelson, R.R., & Winter, S.G. (2000) (eds.). *The Nature and Dynamics of Organizational Capabilities*. Oxford university press.
- [19] Doz, Y.L., 2020. Fostering strategic agility: How individual executives and human resource practices contribute. *Human Resour. Manage. Rev.* 30 (1), 100693.
- [20] Finkelstein, S., & Hambrick, D. C. (1990). Top-management-team tenure and organizational outcomes: The moderating role of managerial discretion. *Administrative science quarterly*, 484-503.
- [21] Goll, I., Brown Johnson, N., & Rasheed, A. A. (2007). Knowledge capability, strategic change, and firm performance: the moderating role of the environment. *Management Decision*, 45(2), 161-179.
- [22] Grimm, C. M., & Smith, K. G. (1991). Research notes and communications management and organizational change: A note on the railroad industry. *Strategic Management Journal*, 12(7), 557-562.
- [23] Hambrick, D.C. and Mason, P.A. (1984), “Upper echelons: the organization as a reflection of its top managers”, *Academy of Management Review*, Vol. 9, pp. 193-206.
- [24] Hannan, M. T., & Freeman, J. (1984). Structural inertia and organizational change. *American Sociological Review*, 49, 149-164
- [25] Haveman, H. A. (1992). Between a rock and a hard place: Organizational change and performance under conditions of fundamental environmental transformation. *Administrative science quarterly*, 48-75.
- [26] Helfat, C.E. & M.A. Peteraf (2003), The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24(10), 997–1010.
- [27] Klarner, P., & Raisch, S. (2013). Move to the beat—Rhythms of change and firm performance. *Academy of Management Journal*, 56(1), 160-184.
- [28] Hodgson, G. M. 1998. Evolutionary and competence-based theories of the firm, *Journal of Economic Studies*, 25(1), 25–56.
- [29] Kosonen, M., Doz, Y.L., 2010. Embedding strategic agility: A leadership agenda for accelerating business model renewal. *Long Range Plan.* 43 (2–3), 370–382.
- [30] Korherr, P., & Kanbach, D. (2023). Human-related capabilities in big data analytics: a taxonomy of human factors with impact on firm performance. *Review of Managerial Science*, 17(6), 1943-1970.
- [31] Kraatz, M. S., & Zajac, E. J. (2001). How organizational resources affect strategic change and performance in turbulent environments: Theory and evidence. *Organization science*, 12(5), 632-657.
- [32] Laaksonen, O., & Peltoniemi, M. (2018). The essence of dynamic capabilities and their measurement. *International Journal of Management Reviews*, 20(2), 184-205.
- [33] Lant, T. K., & Mezias, S. J. (1992). An organizational learning model of convergence and reorientation. *Organization science*, 3(1), 47-71.
- [34] Lant, T. K., Milliken, F. J., & Batra, B. (1992). The role of managerial learning and interpretation in strategic persistence and reorientation: An empirical exploration. *Strategic management journal*, 13(8), 585-608.

- [35] Larrañeta, B., Zahra, S. A., & Galán González, J. L. (2014). Strategic repertoire variety and new venture growth: The moderating effects of origin and industry dynamism. *Strategic Management Journal*, 35(5), 761-772.
- [36] Levine, S., & White, P. E. (1961). Exchange as a conceptual framework for the study of interorganizational relationships. *Administrative Science Quarterly*, 5, 583-601.
- [37] Lumpkin, G. T., & Dess, G. G. (2006). The effect of ‘simplicity’ on the strategy–performance relationship: A note. *Journal of Management Studies*, 43(7), 1583-1604.
- [38] McCarthy, I. P. (2004). Manufacturing strategy: understanding the fitness landscape. *International Journal of Operations & Production Management*.
- [39] McKee, D. O., Varadarajan, P. R., & Pride, W. M. (1989). Strategic adaptability and firm performance: a market-contingent perspective. *Journal of marketing*, 53(3), 21-35.
- [40] Meyer, A. D., Goes, J. B., & Brooks, G. R. (1993). Organizations reacting to hyperturbulence. *Organizational change and redesign*, 66-111.
- [41] Miles, R.E. and Snow, C.C. (1978) *Organizational strategy, structure and process*, New York, McGrawHill.
- [42] Miller, D., & Friesen, P. H. (1984). A longitudinal study of the corporate life cycle. *Management science*, 30(10), 1161-1183.
- [43] Mom, T.J.M., Van Den Bosch, F.A.J. and Volberda, H.W. (2007), “Investigating managers’ exploration and exploitation activities: the influence of top-down, bottom-up, and horizontal knowledge inflows”, *Journal of Management Studies*, Vol. 44 No. 6, pp. 911-931.
- [44] Müller, J., & Kunisch, S. (2018). Central perspectives and debates in strategic change research. *International Journal of Management Reviews*, 20(2), 457-482.
- [45] Nahapiet, J. and Ghoshal, S. (1998), “Social capital, intellectual capital, and the organizational advantage”, *Academy of Management Review*, Vol. 23 No. 2, pp. 242-66.
- [46] Naranjo-Gil, D. (2015). The role of top management teams in hospitals facing strategic change: effects on performance. *International Journal of Healthcare Management*, 8(1), 34-41.
- [47] Nelson, R. R., S. G. Winter. 1982. *An Evolutionary Theory of Economic Change*. Belknap, Cambridge, MA.
- [48] Penrose, E. T. 1959. *The Theory of the Growth of the Firm*. Wiley, New York.
- [49] Peteraf, M., Di Stefano, G., & Verona, G. 2013. The elephant in the room of dynamic capabilities: Bringing two diverging conversations together. *Strategic Management Journal*, 34(12): 1389–1410.
- [50] Pettigrew, A. M., Woodman, R. W., & Cameron, K. S. (2001). Studying organizational change and development: Challenges for future research. *Academy of Management Journal*, 44, 697-71.
- [51] Pisano, G. P. (2015). A normative theory of dynamic capabilities: connecting strategy, know-how, and competition. *Harvard Business School Technology & Operations Mgt. Unit Working Paper*, (16-036).
- [52] Priem, R. L., & Butler, J. E. (2001). Is the resource-based “view” a useful perspective for strategic management research?. *Academy of management review*, 26(1), 22-40.
- [53] Quinn, J.B. (1980). *Strategies for change*. Homewood, IL: Irwin

- [54] Rindova, V. P., & Kotha, S. (2001). Continuous “morphing”: Competing through dynamic capabilities, form, and function. *Academy of management journal*, 44(6), 1263-1280.
- [55] Romanelli, E., & Tushman, M. L. (1994). Organizational transformation as punctuated equilibrium: An empirical test. *Academy of Management journal*, 37(5), 1141-1166.
- [56] Saporta G. (1990), *Simultaneous Analysis of Qualitative and Quantitative Data*, Società Italiana di Statistica Atti della XXXV riunione scientifica, 18-21 aprile 1990 - Volume I, CEDAM Padova.
- [57] Schilke, O., Hu, S., & Helfat, C. E. (2018). Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research. *Academy of management annals*, 12(1), 390-439.
- [58] Singh, J. V., House, R. J., & Tucker, D. J. (1986). Organizational change and organizational mortality. *Administrative science quarterly*, 587-611.
- [59] Smith, K.G., Collins, C.J. and Clark, K.D. (2005), “Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms”, *Academy of Management Journal*, Vol. 48 No. 2, pp. 346-57.
- [60] Tang, J., Crossan, M., & Rowe, W. G. (2011). Dominant CEO, deviant strategy, and extreme performance: The moderating role of a powerful board. *Journal of Management Studies*, 48(7), 1479-1503.
- [61] Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal*, 18(7), 509-533.
- [62] Teece, David and Gary P. Pisano (1994). "The Dynamic Capabilities of Firms: An Introduction." *Industrial and Corporate Change* 3.3 537-556
- [63] Thompson, J. D. (1967). *Organizations in action*. New York: McGraw-Hill
- [64] Vermeulen, F., & Barkema, H. (2001). Learning through acquisitions. *Academy of Management journal*, 44(3), 457-476.
- [65] Webb, D., & Pettigrew, A. (1999). The temporal development of strategy: Patterns in the UK insurance industry. *Organization Science*, 10(5), 601-621.
- [66] Webb, J. and P. Dowson. 1991. "Measure for Measure: strategic change in an Electronic Instruments Corporation." *Journal of management studies* 28: 191-206.
- [67] Weber, Y., & Tarba, S. Y. (2014). Strategic agility: A state of the art introduction to the special section on strategic agility. *California management review*, 56(3), 5-12.
- [68] Wei, Z., Yi, Y. and Yuan, C. (2011), “Bottom-up learning, organizational formalization, and ambidextrous innovation”, *Journal of Organizational Change Management*, Vol. 24 No. 3, pp. 314-329
- [69] Wiersema, M. F., & Bantel, K. A. (1992). Top management team demography and corporate strategic change. *Academy of Management journal*, 35(1), 91-121.
- [70] Wischnevsky, D.J. (2004), “Change as the winds change: the impact of organizational transformation on firm survival”, *Organizational Analysis*, Vol. 12 No. 4, pp. 361-7
- [71] Wooldridge, J. (2002). *Econometric analysis of cross section and panel data*. Cambridge: MIT Press.

- [72] Wu, J., Richard, O. C., Zhang, X., & Macaulay, C. (2019). Top management team surface-level diversity, strategic change, and long-term firm performance: A mediated model investigation. *Journal of Leadership & Organizational Studies*, 26(3), 304-318.
- [73] Yi, Y., Gu, M., & Wei, Z. (2017). Bottom-up learning, strategic flexibility and strategic change. *Journal of Organizational Change Management*, 30(2), 161-183.
- [74] Zajac, E. J., & Kraatz, M. S. (1993). A diatremic forces model of strategic change: Assessing the antecedents and consequences of restructuring in the higher education industry. *Strategic Management Journal*, 14,
- [75] Zajac, E. J., & Shortell, S. M. (1989). Changing generic strategies: Likelihood, direction, and performance implications. *Strategic management journal*, 10(5), 413-430.
- [76] Zhang, Y., & Rajagopalan, N. (2010). Once an outsider, always an outsider? CEO origin, strategic change, and firm performance. *Strategic Management Journal*, 31(3), 334-346.