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SLUGGISH INVESTMENT, CRISIS AND FIRM HETEROGENEITY

Sluggish Investment, Crisis and Firm Heterogeneity[*]

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Abstract

The stagnation of investments and its causes have attracted great attention in the recent economic debate. In this paper we show that the flattening of the capital formation rate at the firm level is not due to lower average propensity to invest. Rather, it is the result of growing heterogeneity of choices among firms. While a subset of firms is oriented towards increasing investments, another group substantially divest. The result is a polarization of conducts that tend to cancel each other out, resulting in a flattening of aggregate investment. We argue that this asymmetry in firm's decisions depends on two main factors. The first one is the diversity of corporate strategies, which firms have developed in the past. The second driver is managerial discretion, that play an important role in the adoption of specific investment / divestment trajectories when faced with a recession. The results of our empirical analysis provide strong supports for our hypotheses: after controlling for contextual and firm-specific structural, financial and demographic variables, corporate strategies and managerial discretion in the allocation of liquid assets explain large part of the heterogeneity in investment decisions during the recession. Policy implications are discussed.

Key words: Fixed investments; Capital formation; Corporate strategies; Resorce based view; Firms heterogeneity; Managerial discretion; Great Recession; Manufacturing; Italy

JEL Code: D22, D25, L22

1. Introduction

Since the last decade of the twentieth century, most advanced economies have recorded a marked stagnation in investments (Fay et al., 2017; Gutierrez and Philippon, 2016). Such trend has affected the processes of capital-embodied technological progress and plant upgrading, with negative consequences for productivity and efficiency (Sakellaris and Wilson, 2004; Cummins and Violante, 2002; Syverson, 2011). Moreover, the decline in investments appears to be dissociated from trends in other variables that, in the conventional view, are considered among the main antecedents of capital formation (Hayashi and Inoue, 1991; Levine, 1991; Blundell et al., 1992), such as profitability, liquidity, funding costs, and market values (Gutiérrez and Philippon, 2018; Diez et al.,2019). Especially in Europe, this decoupling has been particularly accentuated in the aftermath of the Great Recession, where a steady growth in manufacturing added value has been associated with flat capital investments (see Figure 1). What are the factors beneath such decupling between investments and value creation? Is this a general trend, or there exist differences among firms?

Figure 1 – Manufacturing value added and capital investments in selected EU countries, 2000-2015
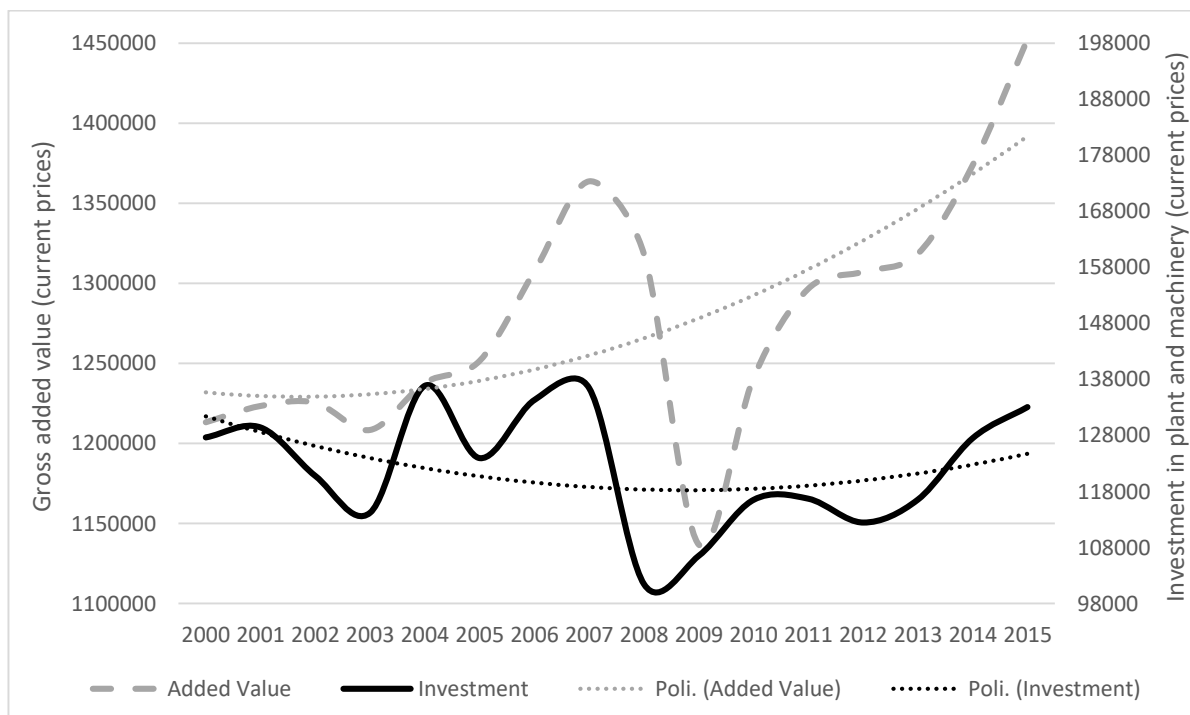
Source: Authhors' own elaborations based on Eurostat data (2020). Selected countries: Germany, Italy, France, United Kingdom, Spain;

These questions have attracted the attention of academics and policy makers. Yet, while the performance-investment decoupling is generally considered as an empirical fact – variously labelled as secular stagnation (Summers, 2015), investmentless growth (Gutiérrez and Philippon, 2016), investment weakness (Banerjee et al. 2015), investment slump (Bussiere et al., 2015), investment hollowing out (Alexander and Eberly, 2018) – there is still no consensus on its determinants. Some authors give emphasis to the role of frictions in capital markets, which slows down the process of capital formation (Gomes et al., 2001; Moyen, 2004; Hennessy and Whited, 2007). Others stresses the limits of analysis circumscribed to physical capital, when firms have extensively raised investments in intangible resources (Peters and Taylor, 2017; Orhangazi, 2018). Other factors associated with decreased competition, tightened governance, financialisation and increased short-termism have received equally relevant attention (Stockhammer, 2004; Gutierrez e Philippon, 2017; Orhangazi, 2008). These explanations, however, find only partial support in the data. Moreover, by focusing primarily on aggregate macro trends, they fail to provide full account of heterogeneous patterns of investments among firms.

In this paper we add to this literature by linking capital investments to the heterogeneity of firm conducts. In particular, we provide two main contributions. First, we document that the flattening of capital formation is not so much (or at least not only) due to a lower average propensity to invest, but rather to a marked and growing heterogeneity of choices among firms. The literature on firm heterogeneity (see among others, Bartelsman and Doms, 2000; Syverson, 2004) reports wide, persistent and (sometime) diverging differences in firm performance, even within narrowly defined industries (Landini et al., 2020). A similar pattern emerges with respect to capital investment choices. While a subset of firms is oriented towards increasing capital formation, another share of firms significantly divests. Thus, the aggregate flattening of investments turns out to follow from the combination of these different conducts, rather than being the consequence of a generalized tendency toward sluggish investment.

Based on this evidence, the second contribution of the paper is to provide an explanation for the observed heterogeneity of investment choices. To do so, we frame our analysis within a resource-based approach to the theory of the firms and exploit Penrose's (1959) concept of *productive opportunity*, which links firm behaviour to personal evaluation of business opportunities (Pitelis, 2005, 2007). On this basis, we argue that the asymmetry in firm's decisions to invest depends on two main factors. The first one is the **diversity of corporate strategies**. Indeed, a consolidated stream of research relates the variety of firm's choices observed in the present to the differentiation of strategic conducts adopted in the past (Miles

and Snow, 1978; Parnell et al., 2000; Collis and Montgomery, 2008). Strategic profiles impact on the accumulation of skills and resources, which in turn affects firm's performance (Ben-Menahem et al, 2013; Arrighetti et al., 2015). Furthermore, in contexts of high uncertainty, the heterogeneity of strategic conducts is strengthened by the different perception of the competitive environment (Coriat, 2001) as well as by the firm-specific reaction capabilities (Archibugi et al., 2013; Landini et al., 2020). On this ground, we suggest that the observed heterogeneity in the patterns of investments can be linked to the stream of resources that firms accumulate as a result of their corporate strategies. These resources impact on the firms' perception of the competitive environment and thus affects their investment decisions. Firms that base their corporate strategies on gaining advantages in the low cost of inputs (both capital and labour) have relatively little incentives to undertake expensive programs of technological upgrading and are thus expected to have low propensity to invest. On the contrary, firms relying on strategies oriented towards product upgrading, innovation and market extension, ground their competitiveness on the quality and efficiency of their productions and are thus pushed to adopt a proactive investment policy.

Alongside corporate strategies, the second driver of investment decisions that we consider is the **discretion of managers**. In fact, while it is certainly the case that past histories of resource accumulation direct firms along a specific pattern of capital formation, managers maintain some degree of freedom in deciding how to allocate financial resources. This is true especially in the presence of recessions, which create highly perturbed and hostile business environment (Cefis and Marsili, 2019, Bartoloni et al., 2020). In the latter, the high degree of uncertainty (Bloom, 2014) and volatility of market signals (Al-Suwailem, 2014) as well the fragmentation of buyer-supplier relationships (Baldwin 2009; Accetturo and Giunta, 2019), make more difficult for firms to sustain their usual competitive advantages and thus rise the relevance of idiosyncratic managerial decisions. In their seminal contribution, Lazonick and O'Sullivan (2000) frame such decisions in terms of two alternatives: to '*retain and reinvest*' corporate earnings inside the company to sustain growth and resource accumulation; or to '*downsize and distribute*', which implies the compression of economic activities and the transfer of liquid assets outside the company, mainly to feed owners' pay-outs. While this dichotomy has been the hallmark of the transition from the manufacturing-based Fordist organization, to the finance-based post-Fordist corporation, it tends to be exacerbated in the context of a recession. The high degree of uncertainty and opacity that surrounds business relationships, can push the allocation of liquid assets in opposite directions, with direct consequences for the heterogeneity of investments.

We test these hypotheses using a large dataset of Italian manufacturing firms with detailed information about internal characteristics and performance observed both before and after the Great Recession (i.e. 2004–2018). We measure investments by relaying on the by-now standard approach based on the identification of *investment spikes* (Grazzi et al., 2016; Disney et al., 2020). The fact the process of capital formation is characterized by lumpiness, i.e. prolonged periods of low or zero investments punctuated by large discrete changes, is well established in the literature (Doms and Dunne, 1998; Cooper and Haltiwanger, 1993, 2006; Caballero, 1999; Cooper et al., 1999; Nilsen and Schiantarelli, 2003). While most of these contributions link such lumpiness to structural factors such as non-convex capital adjustment costs (such as fixed costs) and indivisibility of investment projects, we focus on the role of firm-specific resources and capabilities. In particular, we relate investment spikes observed during the Great Recessions to firm's characteristics before the crisis as well as to proxies of firm's reactions during the first years of the downturn. Overall, the results of our empirical analysis provide strong supports for our hypotheses: after controlling for contextual and firm-specific structural, financial and demographic variables, corporate strategies and managerial discretion in the allocation of liquid assets explain large part of the heterogeneity in investment decisions during the recession. These results are robust to a wide range of alternative specifications, including the split of the sample for firms of different size and age as well as panel estimates exploiting temporal variation within firms.

The remaining part of the paper is organized as follows. The next section discusses the theoretical framework and it develops our research hypothese. Section 3 presents the data and the variables used in the empirical analysis, for which the results are discussed in Setcion 4. Finally, Section 5 concludes.

2. Theoretical framework

2.1 Diversity of corporate strategies

The tension between internal resources and external constraints as drivers of performance is at the core of the most recent research documenting the high heterogeneity of firm conducts (Syverson, 2011). A central element of the debate concerns the degrees of freedom and autonomy left to management in defining strategic choices. In some theoretical models, such as those derived from population ecology (Hannan and Freeman, 1977, 1984) and neo-institutionalism (DiMaggio and Powell, 1983), the emphasis is on the role of environmental,

normative, and inertial constrains and the space left for idyosincratic managerial decisions and heterogeneous behaviour is limited (Crossland and Hambrick, 2011). In others, such as the evolutionary approaches (Nelson and Winter, 1982) and the strategic choice models (Child, 1972) the contribution of management is strengthened. In particular, studies adopting the so-called resource-based view of the firm (Penrose, 1959; Richardson, 1972) highlight how firms combine tangible and intangible resources following specific patterns of accumulation (Pitelis and Teece, 2009; Teece, 2017; Tarù, 2017). Their competitiveness depends on the uniqueness of the skills and resources they develop over time (Kor et al. 2007), which affects also the diversity of their reactions to similar changes in contextual and environmental conditions (Pitelis, 2009).

Within the resource-based view two concepts are particularly relevant to study the diversity of investment decisions among firms. The first one concerns the link between resource heterogeneity and competitive advantage. Following Penrose (1959) firms are conveived as fundamentally heterogeneous both in the resources they dispose of and in their ability to combine them (i.e. capabilities). Such heterogeneity blends with imperfect factor mobility and constrained imitability / substitutability of resources to generate sustained competitive advantages (Peteraf, 1993). Moreover, and this is the second important concept, neither resources nor capabilities are merely given (or can generally be bought), but they have to be developed (Katkalo et al. 2010; Landini et al., 2020). To build them firms draw from their own experience and learning patterns, taking advantage of the resources they already control (Nelson and Winter, 1982; Wernefeld, 1984; Ben-Menahem et al., 2013).

The existence of fundamental (i.e. ex-ante) and cumulative heterogenetiy (i.e. learning patterns) has important implications for the design of corporate strategies and the planning of investment. When entrepreneurs and managers are set to design the competitive position of their company, they face a twofold task: first they have to analyze the resources already available within the organization, and then they have to identify further patterns of resources accumulation, which include also the planning of investments (Barney, 1986). The more such investments can leverage on strategic assets available in the firm, the more durable the consequent competitive advantage. Obviously, since resources and capabilities are ex-ante heterogenous, also the strategic plannings of investments can differ, leading to diverging patterns of accumulation across firms (Miles and Snow, 1978; Dess and Davis, 1984; Parnell et al., 2000; Alvarez and Busenitz, 2001; Miller, 2019).

The fact that corporate strategies, defined as a set of decisions by which firms align their managerial processes (including capabilities) with the environment (DeSarbo et al. 2004), can

be highly heterogeneous is documented by a wide range of studies. In the literature various frameworks have been proposed to classify them, going from the standard differentiation between cost-based and quality-based competition (Bartoloni et al., 2020) to distinctions based on the characteristics of the products that are sold in the market, such as their degree of specialization (Adner et al., 2016). Recently, with particular reference to Italy, Landini et al. (2020) have documented that the degree of strategic heterogeneity present in the economy can also vary over time, following changes of the competitive context such as, in their study, a comprehensive program of institutional reforms.

The influence exerted by the competitive context on firm's decisions is one further aspect that we need to consider in our resource-based explanation of investment behaviour. Here again it is useful to go back to Penrose (1959) who first introduced the concept of *productive opportunity*, namely the idea that firm behaviour depends on the personal evaluation of business opportunities. According to this view, the external environment, markets and demand are perceptions (images) in the manager's mind, which interact with the firm's internal resources and capabilities to motivate and shape the direction of expansion (Pitelis, 2005, 2007). In presence of highly uncertain competitive contexts, firm's decisions depend both on managers' interpretation of the environmental conditions and the related responses. While the former is affected by the cognitive abilities of managers (Helfat and Peteraf, 2015), the latter are conditioned by the available resource and capabilities. It follows that multiple layers of idyosincratic components emerge as factors that can foster a high degree of heterogeneity among firms (Kim and Lim, 1988; Subramanian, 1998; Walker et al., 2003).

To summarize, the resource-based view of the firm suggests that the pattern of resource accumulation which follows the adoption of a given corporate strategy exerts strong influence on investment decisions. By maintaining a standard distinction between cost-based and quality-based competition, we may expect that firms competing primarily on the former – i.e. saving on the costs of inputs (labor, capital, and intermediate goods) – will be eager to ground their competitive advantage on activities related to resource retrenchment and they will thus have little incentives to expand production or upgrade internal technology. As a consequence, their propensity to undertake new investments will be limited. On the contrary, firms grounding their competiveness on product quality, innovation and market extension will have higher incentives towards the frequent updating of their production equipment. Their interpretations of the competitive context are likely be conductive to the identification of new business opportunities and their propensity to invest will thus be sustained. In other words, we suggest that:

Hypothesis 1: The diversity of corporate strategies affects investment decisions during a recession: while firms competing primarily on costs will have low propensity to invest, firms competing on quality will have high propensity to do so.

2.2 Managerial discretion

However, in presence of exceptional events such as a recession managers' idyodincratic choices can be as important as corporate strategies in determining investment decisions. Support to this view can be derived from the integration of two theoretical approaches. The first one is the so-called theory of cognitive subjectivism of management (O'Driscoll and Rizzo, 1985), which suggests that managers read realtity and business opportunities through the lenses of their own subjectivity. Their interpretation of a changing context is deeply influenced by their individual experience of discovery, learning and creativity (Kor et al., 2007). The latter, together with personal knowledge of firm-specific internal resources and multiplicity of their use, pave the way towards a subjective view of economic opportunities. Far from being given and approachable by everyone, such opportunities are the outcome of a subjective path of entrepreneurial creativity and discovery aimed at imagining the combination of new products and internal skills that ensure adequate profit margins (Davidsson, 2015; Baker and Nelson, 2005; Gartner, 1985). It follows that within this framework, even when a symmetrical shock hit the economy, managers' interpretation of the changed context and the related responses can be markedly different and they depend on idyosincratic, i.e. subjective, factors.

Alongside managerial subjectivism, the second theoretical approach that is relevant in our analysis is the theory of environmental jolts. First introduced by Meyer (1982), this approach considers recessions as complex events that create highly perturbed and hostile business environment. Beside standard drops in demand, recessions often produce a steep rise of uncertainty (Bloom, 2014) as well as high exposition to tighter financial constraints (Duygan-Bump et al. 2015). As a consequence, firms are pushed to take decisions that are riskier and more difficult to prioritize (Latham and Braun 2011). Moreover, the frequent breaking-up of trade patterns implies that relationships along the value chain with consumers, suppliers, and competitors become more difficult to predict and manage (Baldwin 2009; Accetturo and Giunta 2018). All these factors contribute to alter the selective environment creating new opportunities and challenges. Accrued competitive advantages weaken and firms need to learn fast about the changed environmental conditions and adapt their behaviour accordingly. In this setting,

therefore, idyosincratic decisions becomes particularly relevant in determining the firm's path through the recession.

The combination of managerial cognitive subjectivism and the view of crisis as environmental jolts has direct implications for the study of investment decisions during recessions. While the approach based on environmental jolts implies that firm-specific managerial decisions play a key role in firm's responses to marcoeconomic shocks, the theory of managerial subjectivism suggests that such decisions can be far from homogeneous. Depending on the managers' subjective interpretation of the new competitive environment, firms can have opposite reaction as far as investments are concerned. In this sense, rather than a homogeneous trend towards divestment, recessions may trigger an increase in the variety of behavioural responses, leading to an increase in heterogeneity compared to the pre-crisis period.

Some intutitions about the potential directions of such responses can be derived by looking at the literature about managerial discretion (Hambrick and Finkelstein, 1987; Wangrow et al., 2015). The latter is usually defined as the *latitude* of the options available to management and is the joint product of a) the rigidity of the constraints imposed by the stakeholders on the decision makers and b) the variety of alternatives that can be pursued in a given competitive context (Hambrick and Abrahamson, 1995). During standard economic periods, the extent of managerial discretion depends on the characteristics of the sector in which firms operate and it tends to be higher (lower) in industries with differentiable (commodity) products, growing (stagnating) demand and unregulated (regulated) markets. Moreover, it is affected by the influence that the financial market exerts on the allocation of additional resources (cash flow) generated within the firm. In particular, Almeida et al. (2016), Jolls (1998) and Asker et al. (2014) have documented that the growing financialization of firms during the last decades has increased the payout rates, including buybacks, and, regardless of the presence of agency conflicts, incentivized the allocation of cash flow away from purposes related to the growth and accumulation of resources within the company. In other words, the so-called "retain-and-reinvest" option, which characterized the consolidation phase of manufacturing companies in advanced countries for a long period (Lazonick and O'Sullivan, 2000), has been replaced by "downsize-and-distribute" choices, generating differentiated performances among firms in terms of size growth and propensity to invest.

The dichotomy between the "retain-and-reinvest" and the "downsize-and-distribute" options can be further polarized in the aftermath of a recession. The latter, together with defensive interpretations of management and ownership, can foster an orientation to cut capital

spending and reduce the range of activities, on the one hand, and, on the other, to allocate cash flow to destinations outside the firm. Such downgrading approach aims at generating new competitive advantages essentially via cost reductions. However, the crisis can push companies in the opposite direction: to leverage on investments already made or to carry out productivity-improving activities that during the recession show temporarily low opportunity costs (Davis and Haltiwanger, 1990; Aghion and Saint- Paul, 1991; Legrand and Hagemann, 2017). In this case, the firm is orientated towards an upgrading of productions, which implies that the payout is contained and most financial resources are absorbed by the formation of capital and the strengthening of internal resources. In other words, the second hypothesis that we put forward is:

Hypothesis 2 - During a recession, managerial discretion differentiate the firms' propensity to invest: while downgrading firms will tend to reduce investments, upgrading firms will increase them.

3. Data and variables

3.1 The MET Syuvery: overview

To test the above mentioned hypotheses, we exploit data collected from two sources: the first wave of the MET Survey and the AIDA-BVD database. The MET Survey is conducted by an Italian private research centre (*Monitoraggio Economia e Territorio s.r.l.*) every two years using a stratified sample of nearly 25,000 Italian manufacturing firms (with partial sample overlap among the different waves).[1] In contrast to other Italian datasets, the sample contains information on firms of all size classes, even micro firms with less than ten employees. The survey contains firm-level information on the company's internal structure, including information on firm size, main investment strategies, and reference markets. The original sample follows a disproportionate Bayesian scheme and is representative at the size (4 dimensional classes), region of origin (20 regions), and industry (10 sectors disaggregated following the 3-digits ATECO 2002 classification) levels. The first wave was conducted during

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[1] The MET Survey share many features of the Capitalia Survey on Manufacturing Firms, another business survey carried out in Italy, which covers the periods ending in 1997, 2000, 2003, and 2006, respectively.

the summer of 2008, a few months before the bankruptcy of Lehman Brothers. Therefore, it contains detailed information on the pre-crisis characteristics of firms, specifically during 2006-2007. [2]

The AIDA-BVD database contains disaggregated balance sheet and profit and loss statement information for the period 2004–2018 for all Italian firms. Moreover, it contains information on the present status of the firms (active vs. non-active and merged vs. acquired). After selecting the firms that are active as of 2007, we match information from the AIDA-BVD datasets with responses to the MET Survey, obtaining a final sample of about 4000 firms. [3] The original sample representativeness in terms of firm size, region of origin, and industry of activity is preserved. [4]

Thus, we obtain an unbalanced panel with information in two time-horizons. First, we have firm-level information on both the internal structure and financial position for the period before the recession. Second, we have access to the disaggregated balance sheet of all firms for the period 2004-2018. These data allow us to study the patterns of investment during the Great Recession.

3.2 Investment spikes

The measurement of firm-level investment is a critical issue for a number of reasons. The first one concerns data availability. Ideally one would like to measure investments by observing the firm's flow of capital expenditures, which is however missing in most balance sheet and financial accounts. Moreover, as we know since the seminal work by Doms and Dunne (1998), the actual pattern of investments is far from the smooth optimizing process predicted by standard theory. Rather, capital investments are *lumpy*: years of repair and maintenance of equipment are followed by one or several years in which investments are large both with respect to the firm and the industry as a whole (Grazzi et al., 2016). Furthermore, capital expenditures are highly concentrated as large investments episodes account for a relatively large fraction of total investments (Gourio and Kashyap, 2007; Nilsen and Schiantarelli, 2003; Disney et al., 2020; Gradzewicz, 2020).

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[2] For more details about the sampling scheme, administrative methods, control procedures, and sample representativeness of the MET Survey see Brancati (2008) and Brancati et al. (2017).

[3] The reduction in the size of the original sample is due to the availability of disaggregated balance sheets in the AIDA-BVD database (see subsection 3.2).

[4] Tables reporting on the sample's representativeness are available from the authors upon request.

To account for these issues the empirical literature has introduced several methods aimed at identifying investments using time series of firm-level capital expenditures (Cooper et al., 1999; Power, 1998; Nilsen et al., 2009). The latter, in particular, exploit the concept of spikes, which are defined as "abnormal" investment events compared to the firm's average behavior. In this paper we follow the same approach, taking however into consideration that a) we can access only information about the firm-level capital stock and b) the period under analysis includes the years of the Great Recession, which are themselves rather exceptional.

In particular, using data for the period 2004-2018, we measure investments as changes in the capital stock ($\Delta K_{i,t}$) and identify a spike whenever $\Delta K_{i,t}$ exceeds α-times the firm-specific linear prediction of investment conditional on the size of the capital stock and the recession. Formally,

$$S_{i,t} = \begin{cases} 1, & if \ \Delta K_{i,t} > \alpha E[\Delta K_{i,t} | K_{i,t-1}, Crisis_t]; \\ 0, & otherwise \end{cases} \tag{1}$$

where α takes value 1.75[5], and $E[\Delta K_{i,t} | K_{i,t-1}, Crisis_t]$ is the estimated value of investment following a linear regression of $\Delta K_{i,t}$ against the log of tangible assets ($K_{i,t-1}$) and a dummy variable selecting the years 2008-2018 ($Crisis_t$).

Figure 2 reports the distribution of the estimated number of spikes (panel A) and the related change in capital stock (panel B) for the period 2008-2018. In line with previous studies, we find that most firms undertake investment spikes, but they are relatively rare events. In our sample 66% of the firms have at least one spike in a ten-years period, but only 15% have more than two (i.e. on average one spike every five years). Moreover, spikes account for significant changes in the capital stock. While firms with no spike understably undergo a reduction in the value of their capital stock between 2008 and 2018 (via depreciation), firms with just one spike increase such value by about 75%. For firms with two or more spikes such an increase is significantly larger, with the value of capital stock in 2018 being more than two times larger than the one in 2008. Overall, these results confirm the lumpiness of firm's investment behaviour as well as the ability of spikes to account for a large fraction of total investments.

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[5] Which is the same value considered, for instance, by Power (1999).

Figure 2 – Investment spikes and changes in capital stock

A. Investment spikes

B. Changes in capital stock
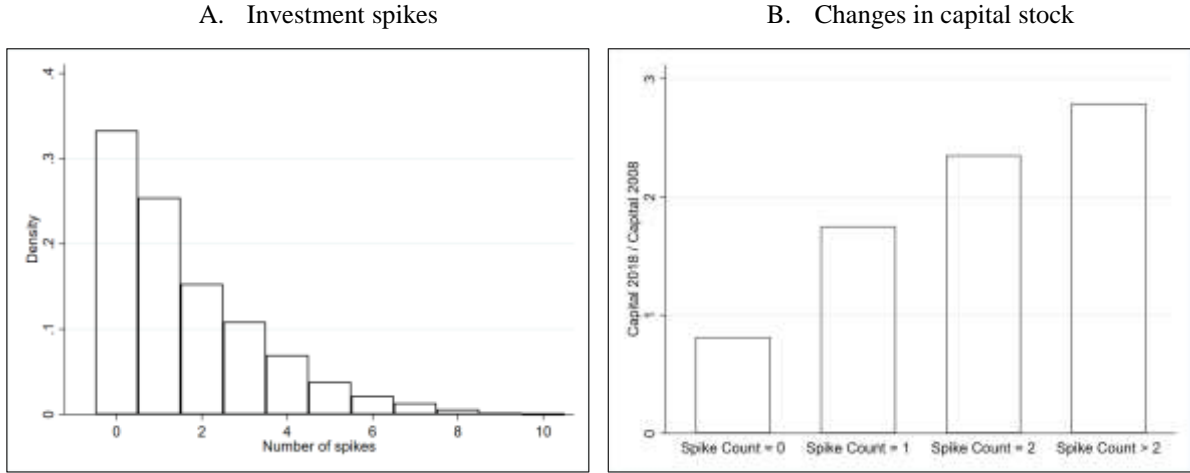
3.3 Corporate strategies and managerial discretion

With respect to the explanatory variables our main focus is on corporate strategies and managerial discretion. As for the former, not having access to detailed information about strategic planning and orientation, we must rely on proxy measures that capture how different strategies translate into observable firm-level characteristics. Following Landini et al. (2020) we focus on two main variables: capital intensity (*K/L*) measured as the value of physical assets per employee, and average wage (*W/L*) measured as the ratio between total labour costs and total number of employees. The former captures the firm's propensity to carry out investments in technology and capital goods, while the latter reflects the firm's tendency to hire skilled, and therefore costly, labour. Then, for each firm *i* and year *t* in the sample, we construct the following profiles:

$$COST_{i,t} = \begin{cases} 1, & if \ K/L_{i,t} < \underline{K/L_t} \ and \ W/L_{i,t} < \underline{W/L_t}; \\ 0, & otherwise \end{cases} \quad (2)$$

$$QUALITY_{i,t} = \begin{cases} 1, & if \ K/L_{i,t} > \underline{K/L_t} \ and \ W/L_{i,t} > \underline{W/L_t}; \\ 0, & otherwise \end{cases} \quad (3)$$

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where $\underline{K/L_t}$ and $\underline{W/L_t}$ is the industry mean (Ateco 2002 - corresponding to NACE rev.1.1 - 2 digits classification) of $K/L_{i,t}$ and $W/L_{i,t}$ respectively. In other words, $COST_{i,t}$ is a dummy variable selecting the firms that in a given year present lower-than-industry-mean capital intensity and lower-than-industry-mean average wage. These are firms that, compared to the most direct competitors, make relatively little investments in capital goods and hire relatively cheap labour. On this basis they are inclined to build cost advantages. $QUALITY_{i,t}$ is instead a dummy variable selecting the firms that in a given year present higher-than-industry-mean capital intensity and higher-than-industry-mean average wage. Compared to the most direct competitors, these firms make relatively large investments in technology and capital goods and hire relatively expensive and skilled labour, which implies that they face relatively large costs. To be viable these firms must focus on productions with large value added and therefore base their main competitive advantage on quality.

For managerial discretion we follow a similar approach. In this case the features that must discriminate among firms are related to firm's reactions in the aftermath of the crisis. For this reason, we focus on the period 2008-2011 and define two groups of variables. The first one is based on proxy measures of firm's choices concerning the upgrading vs. downgrading of productions. To build the latter we first calculate the firm's cost of materials ($MATERIALS_{i,t}$) as the difference between total revenues and value added. Then, we compute the change in the cost of materials and in labour costs between 2008 and 2011 ($\Delta MATERIALS_{i,t}$ and $\Delta W/L_{i,t}$, respectively). On this basis, we define the following groups:

$$DOWNGRADE_{i,t} = \begin{cases} 1, & if \ \Delta MATERIALS_{i,t} < 0 \ and \ \Delta W/L_{i,t} < 0 \ ; \\ 0, & otherwise \end{cases} \qquad (4)$$

$$UPGRADE_{i,t} = \begin{cases} 1, & if \ \Delta MATERIALS_{i,t} > 0 \ and \ \Delta W/L_{i,t} > 0 \ ; \\ 0, & otherwise \end{cases} \qquad (5)$$

In other words, $DOWNGRADE_i$ selects the firms that in the three years following the outbreak of the recession decreased both the cost of materials and the cost of labour (proxied by the average wage). On the contrary, $UPGRADE_i$ identifies the firms whose reaction was just the opposite, i.e. they increased both types of cost. Our working assumption is that a simultaneous

change in such costs signal a specific reaction to the crisis that either goes toward a reduction in the range of production activities or towards their qualitative upgrading.

To complement these measures, we consider an additional variable that we use as proxy for firm's decisions in the aftermath of the recession, which is based on the allocation of liquid assets. Following the dichotomy between the "retain-and-reinvest" and the "downsize-and-distribute" options we build an index capturing whether the resources generated by production activities are re-invested in the company or rather distributed to remunerate profit. In particular, such index is defined as the log of the ratio between the cash flow generated in the years 2008-2011 and the change in tangible assets during the same period (CF/gTA_i), where the latter (to avoid sign issues) is computed as the value in 2011 relative to the value in 2008. The higher (lower) this ratio the stronger (weaker) the firm's propensity to favor the remuneration of profit over invetments in internal resources and thus the stronger the attitude toward a "downsize-and-distribute" ("retain-and-reinvest") option.
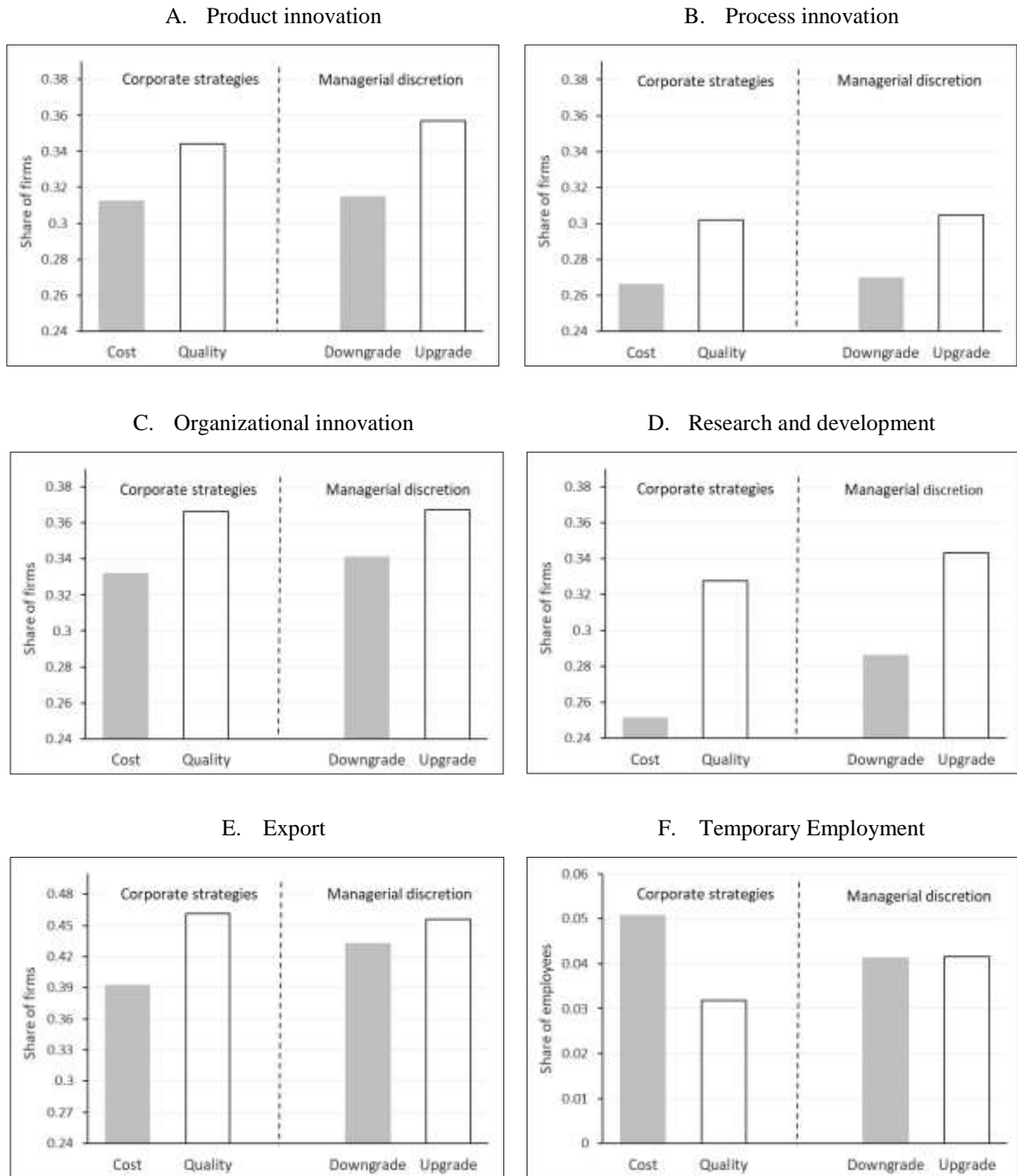
3.4. Comparison among firm profiles

As a first step in our empirical analysis, it is interesting to compare the features of firms belonging to different corporate strategy and managerial discretion profiles. We notice that firms are distributed rather evenly across such categories. In particular, the *COST* and the *QUALITY* groups account for nearly 30% of the firms each. The share of firms that respond to the crisis via an upgrading of productions (*UPGRADE*) is slightly larger reaching 34%, whereas the fraction of firms oriented towards downgrading (*DOWNGRADE*) is 31%. Interestingly, the intersection between these different groups is extremely weak. On this respect, Figure 3 reports the share of firms classified as *DOWNGRADE* and *UPGRADE* for each corporate strategy group. While *COST*-firms are equally likely to react via the downgrading or upgrading of productions, *QUALITY*-firms exhibit a slightly higher propensity to upgrade. In general, the picture that emerges is the one of a weak correlation between corporate strategy and managerial discretion profiles, which confirms the relative independence of these two dimensions.

Figure 3 – Corporate strategies and managerial discretion
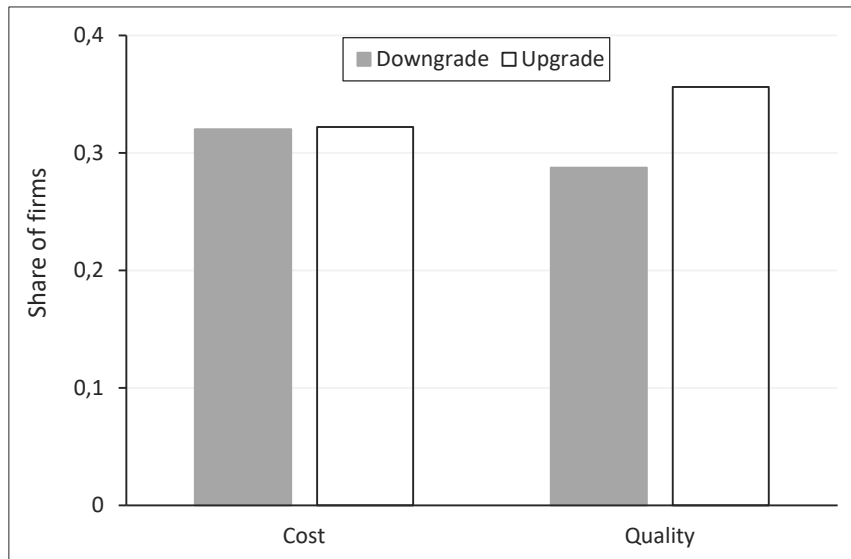
Some more intuitions about the characteristics of the firms in each group can be obtained from Figure 4, which reports mean differences among corporate strategy and managerial discretion profiles for a number of variables included in the MET Survey. On average, *QUALITY* and *UPGRADE*-firms tend to be more engaged with innovation activities compared to *COST* and *DOWNGRADE*-firms respectively. This is true both considering innovation outputs (panels A, B and C) and R&D expenditures (panel D). Moreover, *QUALITY*-firms are significantly more active in international markets via export than *COST*-firms, whereas such difference is smaller for *UPGRADE* and *DOWNGRADE*-firms (panel E). Finally, the internal organization of work is also dimension that largely discriminate firms across corporate strategy profiles, but not in terms of managerial discretion. In particular, while *QUALITY*-firms employ a significantly lower fraction of temporary workers compared to *COST*-firms, such fraction is just about the same in *UPGRADE* and *DOWNGRADE*-firms (panel F). Overall, these results suggest that our classifications, although parsimonious in the use of definitory variables, capture structural differences in the organization of internal resources as well as in the positioning of the markets. This reinforces our confidence in the usefulness of such metrics.

Figure 4 – Corporate strategies, managerial discretion and firm characteristics

A. Product innovation

B. Process innovation

C. Organizational innovation

D. Research and development

E. Export

F. Temporary Employment

3.5. Preliminary evidence

As argued above a growing concern that has recently emerged in the literature concerns the flattening of capital investments in advanced market economies. Our data confirms this trend. Figure 5 reports the evolution between 2008 and 2018 of the mean value of the log of capital

stock and the related standard deviation. While the former has remained substantially unchanged, the latter has remarkably increased. This suggests that during this period there was indeed a flattening of investment, which however went together with an underlying polarization of firm investment conducts: some companies have increased the allocation of resources to the renewal of their physical assets and others have divested or let their capital stock to depreciate. These trends provide further evidence supporting the need to study in greater details the drivers of such heterogeneous behaviour.

Figure 5 –Capital stock mean and standard deviation over time, 2008-2018
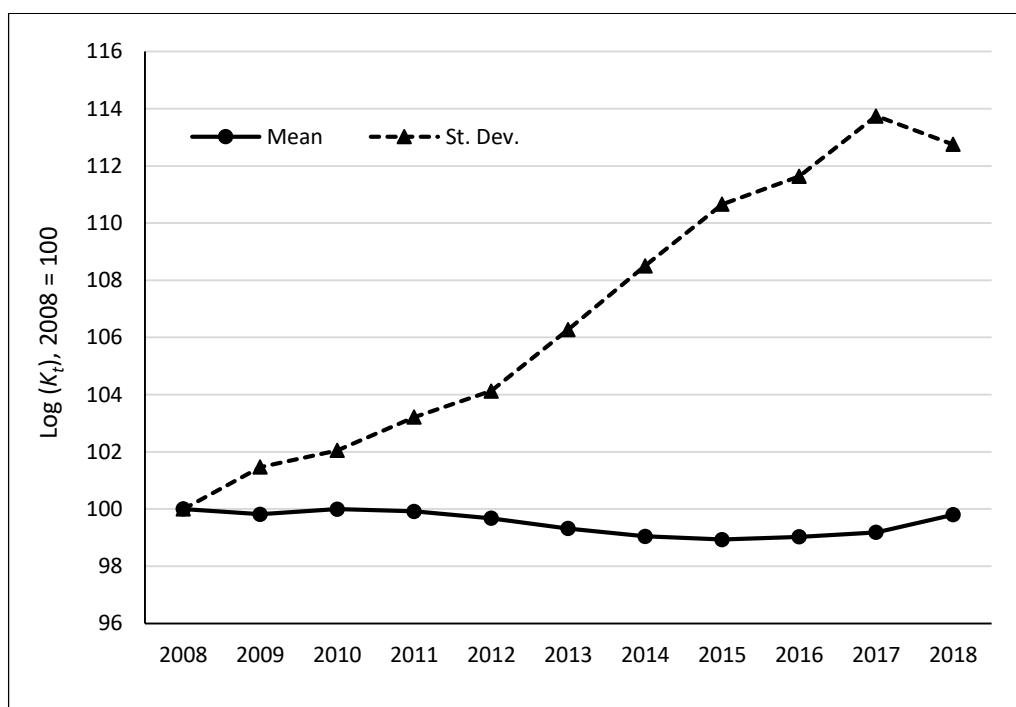
With respect to this last point, one may wonder whether the degree of diversity in investment decisions has undergone any transformation as a result of the recession. In fact, in the literature it is often argued that economic dowturns should have cleanising effect on the economy leading, if anything, to a reduction of firm heterogeneity. On the contrary, our theoretical framework predicts that recessions may spur diversified reaction on the firms' side, which implies that the result could be the opposite, i.e. rising heterogeneity. To check which one of these two views find more support in the data we run a simple empirical exercise using our spike metrics. After having selected two windows of four years before (2005-2008) and after the recession (2009-2012), we compare the change in the mean and coefficient of variation

of investment spikes for different categories of firm size. The results are reported in Figure 6. We notice that for all size categories the trend of the two statistics is the opposite. On the one hand the average number of investment spikes has reduced, on the other their dispersion has increased. These changes suggests that, in line with our theoretical framework, the crisis has actually triggered heterogeneous responses as far as investment are concerned. Our main argument is that such differences depend both on the corportae strategies that firms had adopted before the recession and on their management-led reactions to the crisis outbreak.

Figure 6 – Raising heterogeneity of firm investments during the recession
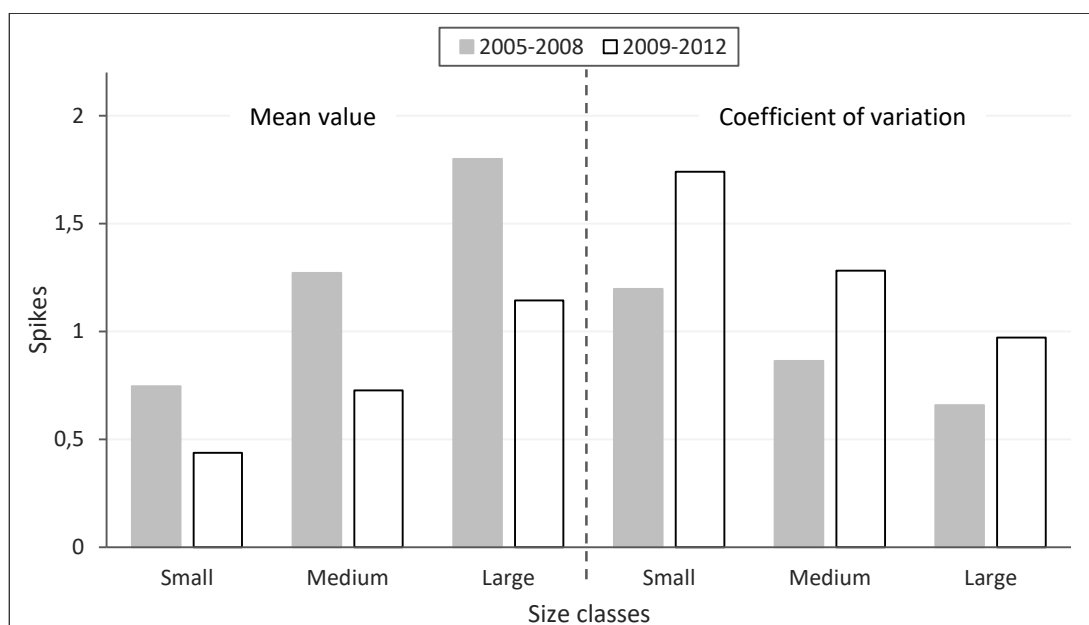
Some preliminary evidence that our argument can indeed be correct comes from Figure 7, which reports the distribution of spikes for the period 2008-2018 distinguishing among corporate strategy and managerial discretion profiles. We notice that the fraction of *QUALITY*-firms with two or more spikes is significantly larger than the one of *COST*-firms. Conversely, the latter are by far the most frequent group in the bins associated with either one or no spike. A similar outline characterizes the comparison between *DOWNGRADE*- and *UPGRADE*-firms, with the latter being the group most frequent in bins with a large number of spikes. These differences suggest that *QUALITY* and *UPGRADE* include firms likely to play a key role in sustaining capital investments during the recession, while *COST*- and *DOWNGRADE*-firms have for the most part divested. Although it is too early to derive some definite conclusion,

such evidence provide support for our research hypotheses. In the next section we will rely on a multivariate analysis to put such hypotheses under stricter and more rigorous empirical scrutiny.

Figure 7 – Corporate strategies, managerial discretion and investment spikes

A) Corporate strategies   B) Managerial discretion
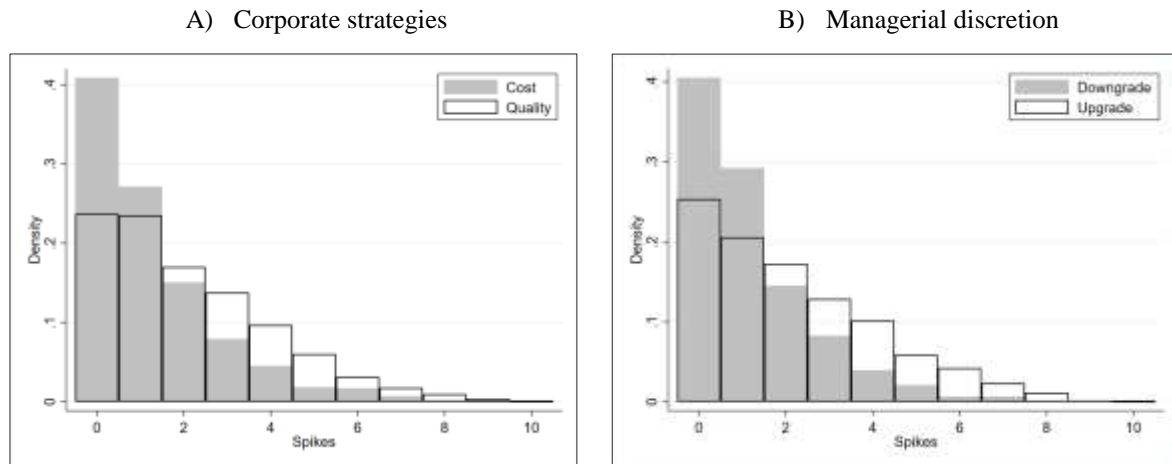
4. Econometric analysis

4.1 Baseline model

Our econometric analysis aims at evaluating the effects of corporate strategy and managerial discretion on firm investments. We start with a baseline specification where we regress the number of investment spikes between 2008 and 2018 against a set of independent variables evaluated at 2008 (i.e. the outbreak of the Great Recession), which includes our corporate strategy and managerial discretion profiles (for the latter type of profile we consider the period 2008-2011, see above). Due to the discrete nature of the dependent variables, we rely on an orderd logit model based on maximum likelihood estimator. Among the set of regressors we include variables that are likely to affect the firm's propensity to invest, which include: size measured as the log of total employees ($SIZE_{i,t}$), age computed as the log of years since the firm's foundation ($AGE_{i,t}$), total factor productivy estimated following Levinsohn and Petrin's (2003) approach ($TFP_{i,t}$), profitability proxied by the return on equity index ($ROE_{i,t}$), and the degree of financial exposure captured by the debt-to-equity ratio ($DEBT/EQUITY_{i,t}$). In all the estimated models we also include dummy variables to control for industry (Ateco 2002 - corresponding to NACE rev.1.1 - 2 digits classification) and region fixed-effects. Table 1 reports descriptive statistics for all our main regressors and Table 2 their correlation matrix.

Table 1 – Descriptive statistics

Variables	Description	Mean	St. Dev.
QUALITY	Firms with higher-than-industry-mean capital intensity and higher-than-industry-mean average wage	0.319	0.466
COST	Firms with lower-than-industry-mean capital intensity and lower-than-industry-mean average wage	0.283	0.450
UPGRADE	Firms that in the period 208-2011 increased both the cost of materials and the cost of labour	0.369	0.482
DOWNGRADE	Firms that in the period 208-2011 decreased both the cost of materials and the cost of labour	0.282	0.450
CF/gTA	Log of the ratio between cash flow in period 2008-2011 and 2011/2008 relative tangible assets value	7.532	1.520
SIZE	Log of total numer of employees	3.452	1.143
AGE	Log of years since the firm's foundation	3.177	0.638
TFP	Total factor productivity	9.702	0.827
ROE	Return on equity	7.747	20.424
DEBT/EQUITY	Debt-to-equity ratio	1.623	3.553

Table 2 – Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) QUALITY	1.000								
(2) COST	-0.430*	1.000							
(3) UPGRADE	0.011	-0.023	1.000						
(4) DOWNGRADE	-0.044*	0.018	-0.479*	1.000					
(5) CF/gTA	0.321*	-0.316*	0.113*	-0.086*	1.000				
(6) SIZE	0.048*	-0.042*	0.013	0.067*	0.583*	1.000			
(7) AGE	0.162*	-0.125*	-0.008	0.052*	0.192*	0.234*	1.000		
(8) TFP	0.272*	-0.282*	0.042*	-0.004	0.810*	0.748*	0.222*	1.000	
(9) ROE	-0.057*	0.052*	0.043*	-0.092*	0.133*	-0.064*	-0.085*	0.160*	1.000
(10) DEBT/EQUITY	-0.074*	0.084*	-0.005	0.016	-0.135*	-0.094*	-0.129*	-0.132*	-0.120*

Notes: Significance level: * $p < 0.05$.

Table 3 – Corporate strategies, managerial discretion and investment spikes: ordered logit

Variables	(1)	(2)	(3)
QUALITY	0.175**	0.163**	0.177**
	(0.075)	(0.075)	(0.078)
COST	-0.198**	-0.184**	-0.199**
	(0.077)	(0.077)	(0.079)
UPGRADE		0.606***	0.634***
		(0.074)	(0.075)
DOWNGRADE		-0.475***	-0.478***
		(0.076)	(0.078)
CF/gTA			-0.088**
			(0.036)
SIZE	0.204***	0.233***	0.223***
	(0.048)	(0.049)	(0.052)
AGE	-0.040	-0.025	-0.024
	(0.052)	(0.052)	(0.054)
TFP	1.042***	1.035***	1.168***
	(0.074)	(0.075)	(0.100)
ROE	0.000	-0.002	-0.003*
	(0.002)	(0.002)	(0.002)
DEBT/EQUITY	0.022**	0.020**	0.019*
	(0.009)	(0.010)	(0.010)
Industry FE	Yes	Yes	Yes
Region FE	Yes	Yes	Yes
Pseudo R^2	0.093	0.107	0.106
Observations	3,924	3,907	3,742

Notes: Ordered logit estimates. Robust standard errors in parentheses. Dependent variables is the number of investment spikes. For definition of the explanatory variables see Table 1. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

The results of our baseline specification are shown in Table 3. In column (1) we include only corporate strategy profiles together with standard firm-level predictors of investments and a full set of industry and region dummies. In column (2) we add the managerial discretion profiles. Finally, in colum (3) we report the results of a full model specification where also the index measuring the allocation of liquid assets between internal resources and profit remuneration is included. Overall, the results provide strong support for our theoretical hypotheses. Being a *QUALITY*-firm is associated with a significantly higher probability of undertaking investments during the recession compared to the omitted category, whereas for *COST*-firms such probability reduces. A similar difference emerges for *UPGRADE*- and *DOWNGRADE*-firms: while the former are more likely to experience investment spikes, the latter are less likely to do so. Consistently with such results, we also find that a stronger orientation towards profit remuneration (i.e. high *CF/gTA*) is correlated with lower chances to spike.

With respect to the other control variables, we find results that are in line with the previous literature. Larger and more productive firm are more likely to undertake investment in capital assets. At the same time, neither age nor profitability turns out to be significant predictors of investments. This result confirms previous evidence on the weakness of profit as a driver of capital accumulation, which has interesting implications especially in terms of taxation policy (Bottazzi et al., 2010). In particular, it takes away plausibility to the arguments suggesting that taxing profit would harm the economy by discouragning investments. Finally, we find that higher financial exposition measured by the debt-to-equity ratio is associated with more spikes, which can be reasonably explained by the fact that companies that grow and use internal cash flow for investments have favorable access to the credit market.

Table 4 – Corporate strategies, managerial discretion and investment spikes: marginal effects

Outcome	Quality (1)	Cost (2)	Upgrade (3)	Downgrade (4)	CF/gTA (5)
Spike = 0	-0.032**	0.036**	-0.116***	0.087***	0.016**
	(0.014)	(0.015)	(0.014)	(0.014)	(0.006)
Spike = 2	0.011**	-0.012**	0.039***	-0.029***	-0.005**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.002)
Spike = 4	0.010**	-0.011**	0.034***	-0.026***	-0.005**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.002)
Spike = 6	0.003**	-0.003**	0.010***	-0.007***	-0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Note: Marginal effects for key explanatory variables derived from logit estimates. Robust standard errors in parentheses. Dependent variables is the number of investment spikes. For definition of the explanatory variables see Table 1. Only selected outcomes are reported. Outcome > 6 have incidence smaller than 2% and are not reported. Significance level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 4 reports marginal effects for the variables of interest and a defined number of spikes. When all the other predictors are kept at their mean, being a *QUALITY-* and *UPGRADE-* firm reduces the probability of not undertaking any investment spike between 2008 and 2018 by 3.2% and 11.6% respectively. To be a *COST-*firm increases such probability by 3.6%, and for *DOWNGRADE-*firm the increase is about 8.7%. When we consider two or more spikes the sign of the coefficients reverses. *QUALITY-*firms are 1% more likely to have two or four spikes and for *UPGRADE-*firms the magnitude of the effect is even higher: 4% and 3% respectively. On the contrary, both *COST-* and *DOWNGRADE-*firms exhibit lower chances to undertake multiple investments: the former are 1% less likely to undertake two or four spikes and for

DOWNGRADE-firms such probability goes down to between 2% and 3%. For a number of spikes equal to six, being a relatively rare envent, the magnitude of the estimated coefficients significantly reduces for all firm groups. However, the sign of the coefficients is coherent with the previous evidence. Also for the index capturing the firm's orientation towards profit remuneration we find highly consistent result. While a marginal increase in such index increases the chances of not undertaking any spike by 1.6%, it reduces the probability of having two or more spikes between 0.5% and 0.1%.

The results of our baseline specification suggest that, in line with our theoretical framework, both corporate strategies and managerial discretion are important predictors of investment behavior. Firms that are used to ground their competitive advantage on quality exhibit a stronger orientation towards investment compared to firms that compete primarily by containing costs. Similarly, firms that respond to the recession by prioritizing the accumulation of internal resources over the remuneration of profit margins exhibit higher propensity towards sustaining capital expenditures compared to firms that give priority to short-term payoffs instead (Seo et al., 2020). The effects associated with these firm-specific attitudes hold after controlling for a relatively large number of variables, which include firm-level characteristics and contextual controls. As a result, such attidutes can account for large part of the heterogeneity in investment behaviour observed during the recession.

4.2 Robustness checks

In this section we report the results of some additional empirical exercises that help strengthening the robustness of our findings. First, we check whether coefficients are affected by the chosen estimation method. In columns (1) to (3) of Table 5 we report estimates obtained using the same set of variables discussed above but employing an ordered probit model. The main results are confirmed: *QUALITY-* and *UPGRADE*-firms are more likely to invest, whereas *COST-* and *DOWNGRADE* firms are less likely to do so.

The second robustness check that we carry out is based on the splitting of the sample depending on firm size. In particular, given our definition of corporate strategy and managerial discretion profiles one may wonder whether their effect on investment is limited only to large firms, which are usually endowed with larger resource bases and more skilled management. For this reason in column (4) of Table 4 we estimate our baseline specification considering only firms with less than 25 employees. All our focus variables remain highly significant and

their effect is consistent with the theoretical predictions. The only exception is for *COST*-firms, whose coefficient is not statistically significant. Part of this result can be explained by the fact that most small firms belong to this category and there might not enough variability in such category to explain their investment behaviour.

Table 5 – Drivers of investment spikes: robustness checks

| VARIABLES | Dependent variable: number of investment spikes | | | | | |
	OP (1)	OP (2)	OP (3)	Small (4)	Young (5)	Old (6)
Quality	0.111***	0.106**	0.118***	0.287**	0.171	0.183*
	(0.043)	(0.043)	(0.044)	(0.130)	(0.128)	(0.102)
Cost	-0.111**	-0.102**	-0.113**	-0.164	-0.141	-0.271**
	(0.044)	(0.045)	(0.046)	(0.118)	(0.113)	(0.117)
Upgrade		0.355***	0.370***	0.582***	0.740***	0.559***
		(0.042)	(0.043)	(0.113)	(0.112)	(0.105)
Downgrade		-0.283***	-0.289***	-0.396***	-0.408***	-0.553***
		(0.044)	(0.045)	(0.125)	(0.121)	(0.104)
Profit PO			-0.054***	-0.136***	-0.133**	-0.065
			(0.021)	(0.050)	(0.055)	(0.049)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.095	0.109	0.108	0.079	0.110	0.108
Observations	3,742	3,924	3,907	1,689	1,734	2,008

Notes: Columns 1-3 report results from ordered probit estimates. Column 4 reports results from ordered logit estimates on a subsample of small firms (lass than 25 employees). Column 5 reports results from ordered logit estimates on a subsample of young firms (firm's age is smaller than the industry mean age). Column 6 reports results from ordered logit estimates on a subsample of old firms (firm's age is larger than the industry mean age). Robust standard errors in parentheses. Dependent variables is the number of investment spikes. For definition of the explanatory variables see Table 1. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

One final exercise that we perform looks into the role of firm's age. As argued above one of the key difference between corporate strategies and managerial discretion is that the former depends on the firms' historical evolution, while the latter captures their reaction to the shock. In this sense, one may expect that the effect of corporate strategies can become weaker for relatively young firms, as the latter lack the time to accumulate resources that tight them to a specific strategic profile. To check whether this is indeed the case, in columns (5) and (6) of Table 4 we run our baseline model splitting the sample depending on whether firms have higher vs. lower-than-industry-mean age. The results confirm our prior. While managerial discretion profiles remain significant and with the expected sign independently of firm age, corporate

strategy profiles loose power in explaining investment behaviours for young firms. If anything, this result provides further support to the ability of our metrics to capture firms' attitudes that are strongly related to specific learning patterns firms have gone thorugh during their evolution.

4.3 Panel estimates

An additional test of our hypotheses is obtained through a set of multivariate panel estimates. Compared the baseline cross-section, the panel specification allows us to exploit temporal variation within firms thus providing more robust evidence. In particular, we regress the dichotomous spike variable against the same set of covariates discussed above. Given the nature of the dependent variable, estimates are obtained using a probit model with random effects. To maintain the temporal order characterizing strategic and investment decisions, in all models corporate strategy profiles are included with one year lag.

Table 6 – Drivers of investment spikes: panel estimates

VARIABLES	(1)	(2)	(3)
Quality (lagged)	0.071**	0.072**	0.104***
	(0.03)	(0.032)	(0.03)
Cost (lagged)	-0.027	-0.008	-0.045
	(0.034)	(0.035)	(0.039)
Upgrade		0.140***	0.195***
		(0.028)	(0.029)
Downgrade		-0.169***	-0.226***
		(0.031)	(0.034)
Profit PO			-0.342***
			(0.018)
Firm-level controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Region FE	Yes	Yes	Yes
Rho	0.183***	0.181***	0.254***
Observations	21,472	23,156	22,935
N. of firms	5,079	5,186	5,177

The results of this exercise for the main variables of interest are reported in Table 6. In line with the previous evidence, the coefficient associated with *QUALITY*- and *UPGRADE*-firms is positive and significant, which suggest that these firms are indeed more likely to experience an investment spike compared to their benchmark and omitted categories. On the

contrary, *DOWNGRADE*-firms exhibit a negative and significant coefficient, providing further evidence that their propensity to invest is relatively low. Additional evidence supporting the importance of managerial discretion comes from the index capturing the firm's orientation towards profit remuneration, which is again negative and significant. Finally, in this specification we find no significant effect for the *COST* profile.

5. Conclusion

In this paper we document that the flattening of capital formation rate at the firm level is not due to a lower average propensity to invest, but rather to a marked and growing heterogeneity of choices among firms. The evidence gathered shows a clear differentiation in the conduct of firms that react differently to the change of the context in which they operate, especially during a recession: while a subset of firms is oriented towards increasing investments, another group of firms choose to divest. The result is a polarization of the conducts that tend to cancel each other out, resulting in a flattening of the aggregate investments over time. Therefore, the weakness of capital formation derives from the contrast of different orientations and not from a general attenuation of the propensity to invest.

A marked difference in the propensity to invest is evident already during the early stages of the recession. Contrary to what is claimed in some contributions (Hall et al., 1995; Caballero and Hammour, 1996; Gomes et al., 2001), a recession does not significantly reduce the heterogeneity among firms. We argue that this asymmetry in investment decisions depends on two main factors. The first one is the diversity of corporate strategies, which firms have developed in the past and which have an impact on the conduct of the present. Strategic profiles impact on the accumulation of skills and resources, which in turn affects firm's performance. In addition, knowledge, experience and strategic objectives developed in the past contribute to differentiate the perception of the available opportunities, determining a significant impact on investment decisions. Firms that base their corporate strategies on gaining advantages in the low cost of inputs (both capital and labour) have relatively little incentives to undertake expensive programs of technological upgrading and are thus expected to have low propensity to invest. On the contrary, firms relying on strategies oriented towards product upgrading, innovation and market extension, ground their competitiveness on the quality and efficiency of their productions and are pushed to adopt a proactive investment policy in order to enhance and consolidate investments made in the past and exploit new opportunities.

Secondly, in addition to corporate strategies, we argue that managerial discretion plays an important role in the adoption of specific investment trajectories. In fact, while industry

characteristics and structures affect capital formation, managers maintain some degree of freedom in deciding how to allocate financial resources. Economic uncertainty and the recession accentuate managerial discretion making decisions regarding capital formation less objective and more difficult to compare. In particular, we argue that while a subset of firms has chosen to 'retain and reinvest' financial earnings inside the company to sustain growth and resource accumulation, another group has chosen to 'downsize and distribute' the internal cashflow, with resulting compression of economic activities and the transfer of liquid assets outside the company. In other words, the recession has emphasized the proactive orientation and propensity to invest of some companies while promoting the defensive choices and reluctance to invest of others.

Overall, the results of our empirical analysis provide strong supports for our hypotheses. By combing different estimation methods, and controlling for a wide set of co-variates, we show that corporate strategies and managerial discretion in the allocation of liquid assets explain large part of the heterogeneity in investment decisions during the recession.

The policy implications associated with these findings appear to be worthy of further analysis. Whether, on the one hand, it appears appropriate to develop measures aimed at supporting the growth of fixed capital, on the other, the presence of a strong heterogeneity in behavior casts doubt on the appropriateness of an undifferentiated industrial policy and urges the introduction of 'selective' measures. Recognizing the irreducible variety of firms means being aware that different firms react differently to similar incentives. From this conclusion, it emerges the need to go beyond a macroeconomic approach to the evaluation of investment processes, which is inevitably anchored to the average behavior of firms and not to their heterogeneity. Hence the need to rethink, not only the quantitative scale, but also the range of measures to support investment. Facilitating access to credit can increase the propensity to invest, but it is much more likely that measures intended to increase final demand, to reduce uncertainty, to strengthen firm's intangible resources and human capital and to incentivize managerial choices aimed at fostering growth (rather than divestment) are much more effective.

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