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Sara Amoroso
German Institute for Economic Research DIW Berlin

Benedikt Herrmann
Joint Research Centre, European Commission

Alexander S. Kritikos
German Institute for Economic Research DIW Berlin, University of Potsdam, IZA and IAB

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

The Role of Regulation and Regional Government Quality for High Growth Firms: The Good, the Bad, and the Ugly*

High growth firms (HGFs) are important for job creation and considered to be precursors of economic growth. We investigate how product- and labor-market regulations, as well as the quality of regional governments that implement these regulations, affect HGF development across European regions. Using data from Eurostat, OECD, WEF, and Gothenburg University, we show that both regulatory stringency and the quality of the regional government influence the regional shares of HGFs. Additionally, we find that the effect of labor- and product-market regulations ultimately depends on the quality of regional governments. The institutional quality has a moderating role in dening the effect of regulations on the regional shares of HGFs. Our findings contribute to the debate on the effects of regulations by showing that regulations are not, per se, "good, bad, and ugly", rather their impact depends on the efficiency of regional governments. Our paper offers important building blocks to develop tailored policy measures that may influence the development of HGFs in a region.

JEL Classification: H11, L25, L50, R11, R50

Keywords: high growth firms, regulation, quality of governments, regional development

Corresponding author:
Sara Amoroso
German Institute for Economic Research DIW Berlin
Mohrenstr. 58
10117 Berlin
Germany

E-mail: samoroso@diw.de

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1 Introduction

High growth firms (HGFs)[1] are receiving considerable attention from policymakers because of their potential to contribute to productivity growth[2] and job creation (Henrekson and Johansson, 2008; Coad et al., 2014). In Europe, these firms alone are responsible for more than 50% of employment growth, even though only one in ten companies with more than 10 employees is, on average, a HGF (Flachenecker et al., 2020),[3] showing that the small number of HGFs are economically relevant as job creators, contribute significantly to economic development, and have been more resilient to the COVID-19 crisis in terms of avoiding negative employment effects (Teruel et al., 2022).

HGFs are unequally distributed. The OECD and the European Commission report evidence of stark differences in the shares of HGFs across countries (Commission, 2016; Schreyer, 2000). For example, in 2018, the share of high-growth firms among all active enterprises with at least 10 employees was more than six times greater in the Netherlands than in Romania.[4]

A growing literature on HGFs investigates both micro- and macro-level factors explaining the specific characteristics of this type of firm and their distribution across countries. Among macroeconomic factors, since the 1970s, the role of regulation for the economic performance of countries has been central in political economy literature. One channel through which regulation can impact growth and employment is via its effect on firm dynamics. Accordingly, there is considerable literature on the impact of regulations on entry (Djankov et al., 2002; Ciccone and Papaioannou, 2007; Ardagna and Lusardi, 2010). Yet, only a few studies address the impact of regulation on high growth firms (Bravo-Biosca et al., 2016; Flachenecker et al., 2020), and these only examine cross-country differences, leaving the heterogeneity in the distribution of HGFs across regions largely unexplored.

However, regional heterogeneity matters when exploring the link between regulations and HGFs in Europe. The Committee of Regions (CoR) states that the majority of EU Legislation is implemented by regional and local authorities as they "have valuable first-hand experience of applying EU legislation, in close contact with local businesses,

[1] HGFs are companies with a minimum of 10 employees that are able to sustain a growth of employment or turnover of 20% for 3 consecutive years.

[2] Haltiwanger et al. (2013) provide evidence that HGFs contributed significantly to productivity and job growth in the 1990s and 2000s. Decker et al. (2016) argue that the reported decrease in the rates of high-growth firms was one of the main contributing factors to the slowdown in US productivity since 2010.

[3] We should emphasize that these figures refer only to the proportion of firms with at least 10 employees, which represents 10% of the total population of firms. See Section 3 for more details.

[4] https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20201201-1

social partners, civil society and citizens."[5] In this regard, the quality of the regional governance may play an important role alongside the level of regulation. Acemoglu et al. (2001) are among the first to highlight the role of institutional quality in explaining the differences in growth rates across countries. Further, several papers have empirically identified the causal effects of a better administration on higher income per capita, returns to public policy, and local development (Hall and Jones, 1999; Acemoglu et al., 2001; Jalilian et al., 2007; Crescenzi et al., 2016, 2022).

Despite the key role of regional government quality, no previous study looks at how the heterogeneity in the quality of regional governments affects the relationship between regulations and HGFs. Therefore, the main aim of this paper is to examine the mechanisms through which the heterogeneity of government quality affects the interplay between regulations and HGFs. In this context, we hypothesize that regulations might be conducive of prosperity, increasing the regional share of HGFs, when implemented by high quality regional governments.

To investigate our research question, we match several open source data sets at the NUTS-2 and 1-digit NACE levels from various sources including Eurostat, Gothenburg University, the OECD, and the World Economic Forum. We use the European Quality of Government index to measure the quality of regional governments. This indicator summarizes citizens' and businesses' experiences with public services in their regions while remaining agnostic on whether these services are provided by local or regional self-governments, or by local and regional branches of national governments. To estimate the direct and moderating role of government quality in the relationship between regulations and the share of HGFs, we use a series of linear regression models. In particular, to observe how the impact of regulation varies with the quality of government, we use interaction effects between regulations and quality of government alongside separate regressions for regions with different levels of government quality and for regions that improved or worsened their quality of government. This approach allows us to reveal under what conditions a change in regulatory stringency may impact the shares of HGFs at the regional level.

Our paper contributes to the literature on regulation and institutional quality. First, it provides empirical evidence on the direct impact of labor- and product-market regulations and of the government quality on the regional shares of HGFs in Europe. Second, and more importantly, it investigates the interaction between national regulations and regional government quality, exploring the heterogeneity in the regulatory impact on

[5]See page 3 of a CoR publication from 2010 https://cor.europa.eu/en/our-work/Documents/Our-work/lisbon-treaty.pdf and page 9 of a CoR publication from 2019 doi:10.2863/20039

HGFs. We find that the heterogenous effect of labor- and product-market regulations on the regional share of HGFs is moderated by the quality of regional government; thus, it is the institutional quality that is the decisive factor turning regulations good, bad, or ugly in their impact on the regional development of HGFs.

Section 2 summarizes the literature related to institutions and economic growth as well as HGFs. Section 3 describes the data sets. The estimation strategy and results are reported in Section 4. Finally, Section 5 discusses the results and concludes.

2 Review of the literature

2.1 Institutions and economic growth

Institutions are a major determinant of wealth and long-term growth (Djankov et al., 2002). Institutions can be defined as "the rules of the game of a society or more formally [...], the humanly devised constraints that structure human interaction. They are composed of formal rules (statute law, common law, regulations), informal constraints (conventions, norms of behavior, and self-imposed rules of behavior); and the enforcement characteristics of both." (North, 2016, p.3). The role of formal institutions (e.g. regulations, property rights, statutory law, etc.) for economic growth and development has been generating considerable interest among scholars of political sciences and economics since the 1970s. Public interest theory of regulation, fathered by Pigou and Aslanbeigui (1938), holds that regulation seeks the protection and benefit of the public at large. The driving argument of this theory is the presence of externalities, such as pollution, and corresponding market failures. The market may not be able to allocate the resources efficiently when there are goods with public good-characteristics, information asymmetries, monopoly power, or oligopoly power, etc. A government that pursues social efficiency counters these failures, protecting the public through regulation (Ogus, 2004; Morgan and Yeung, 2007). The establishment of the rule of law can safeguard consumers. For example, the introduction of property rights incentivizes investors and encourages companies to create new technologies.

In contrast, public choice theorists see regulation as socially inefficient and as a tool to create rents for bureaucrats or incumbent firms (McChesney, 1987; Shleifer and Vishny, 1997). Niskanen (1971) is the first to argue that public administration reduces social efficiency, as bureaucrats seek to increase their budgets and power. In the wake of Niskanen's seminal work, several empirical papers report evidence of a negative relationship between regulatory institutions and indicators of economic growth and development i.e., technology diffusion, productivity and employment growth, as well as firm entry and

growth (Lynn et al., 1996; Nickell, 1997; Nicoletti and Scarpetta, 2003; Blanchard, 2004; Acemoglu et al., 2005; Ciccone and Papaioannou, 2007; Buccirossi et al., 2013; Bravo-Biosca et al., 2016; Escribá-Pérez and Murgui-García, 2018).

The empirical evidence on the link between regulation and economic growth is polarizing, mirroring these contrasting approaches. While some work finds a positive relationship between legislation and economic growth (Fukumoto, 2008; Ash et al., 2022), others provide evidence for the negative consequences of regulation on GDP growth (Djankov et al., 2006), employment (Bailey and Thomas, 2017), and productivity (Nicoletti and Scarpetta, 2003). Other scholars were subsequently inspired to investigate this issue. For example, Di Vita (2018), find that regulatory complexity (as the sum of European directives, national and regional laws) is an impediment to the growth of regional GDP and per capita income in Italy.

Conversely, there is unanimous consensus on the positive role of institutional quality. Hall and Jones (1999) and Acemoglu et al. (2001) highlight the role of institutional quality in explaining the differences in growth rates across countries. Further evidence shows that "effective regulation" (Jalilian et al., 2007) is needed for the economy to grow. In an analysis of economic growth in Spanish municipalities, Balaguer-Coll et al. (2022) find evidence that municipal economic growth is increasing with the quality of its public administration. This positive impact is particularly strong for poor municipalities. Moreover, the availability of the regional index of quality of government developed by Charron et al. (2014) has spurred a number of studies on the role of local institutional endowment. For instance, Ketterer and Rodríguez-Pose (2018) find, with a sub-national analysis, that government effectiveness and the fight against corruption are conducive to regional economic growth. Agostino et al. (2020) also report strong evidence of the positive relationship between regional institutional quality and total factor productivity of European manufacturing small and medium-sized enterprises. Cortinovis et al. (2017) show that regional government quality matters for industry diversification.

2.2 Regulations, its Implementations and High Growth Firms

Given its economic relevance, research on HGFs has gained momentum, with two main lines of research developing in parallel. The first research strand looks at the micro-level characteristics explaining the emergence and growth of firms. In a survey of the literature on firm growth, (Storey, 2016, p.122) identifies and classifies 35 characteristics into three categories: The *starting resources of the entrepreneur(s)*, e.g., motivation and education; *the firm*, e.g., age and size; and *strategy*, e.g., management and personnel training and market positioning. Generally, HGF tend to be younger, more international, more inno-

vative, and heterogeneously distributed across countries and sectors (Audretsch, 2012; Teruel and de Wit, 2017; Konon et al., 2018). Some specific firm characteristics, such as rapid past employment and export growth, as well as recruiting and training qualified personnel, seem to be good predictors for identifying firms that have a higher likelihood of becoming HGFs (Lopez-Garcia and Puente, 2012).

The second line of inquiry, to which this paper contributes, considers the regional and local enabling environment, such as regulatory and framework conditions. Several innovation scholars investigate the relationship between formal institutions and high-growth firms. For example, Davidsson and Henrekson (2002) examine the relationship between Swedish institutional setups and entrepreneurial activity, such as firm entry and growth. Their findings suggest that high rates of taxation (of labor and entrepreneurial income) weakens the start-up and scale-up incentives. Further, strict labor security legislation and wage-setting institutions may disadvantage smaller firms with good growth prospects. These firms need the flexibility to adjust the number of employees in response to the changes in demand. Flexibility and freedom of contracting may help these firms achieve their high-growth potential. Henrekson and Johansson (2008) corroborate this hypothesis by finding that labor regulations, especially those that restrict contracting flexibility, are harmful for enterprises that would like to grow rapidly. More recently, Bravo-Biosca et al. (2016) show that stringent employment protection legislation is related to lower shares of both growing and shrinking firms in sectors that are more labor intensive and more innovative, in turn, reducing the speed of the resource reallocation.

Moreover, restrictive product market regulation may affect firms' investment decisions as well as the decisions whether to enter or to leave the market. High transaction and entry costs may discourage small, young, and innovative companies, which are usually unable to get sufficient capital or to overcome cost- and non-cost related barriers to entry and growth. Djankov et al. (2002) analyze data on entry regulation in 85 countries and find that heavy entry regulation benefits only politicians and bureaucrats, and is associated with lower quality public and private goods. Falkenhall and Junkka (2009) claim that low barriers to entry and contestable markets are key for the development of high-growth firms in Sweden. Therefore, the predominant opinion on the effect of regulation on firm growth is that a stringent regulatory framework hampers business growth because high taxes, alongside entry and labor market regulations, create obstacles that startups are neither financially nor organizationally equipped to overcome (Belitski et al., 2016; Audretsch et al., 2022).

To some extent, in contradiction to this picture, the review of Kitching (2006) on regulation and business performance, while also reporting evidence of mainly negative

effects of regulation and taxes for business growth and performance, finds occasional evidence of the potential benefits of regulation. For example, statutory audits impose financial discipline on firms and protect society from business malpractice. Further, environmental regulations can stimulate firms to find innovative product and process solutions. In a follow-up review, Kitching et al. (2015) argue and show, with selected case studies, that regulation generates contradictory effects, "enabling as well as constraining performance." A study by Lee et al. (2015) of UK firms finds that regulation is actually less likely to be a problem for high-growth firms, because "presumably in order to grow, the businesses must have succeeded in overcoming some regulatory difficulties or have been lucky enough not to face them" (p. 189). Lucidi (2012) and Amoroso and Martino (2020) also find that too much flexibility in the labor market may reduce firm ability to attract and retain talented employees.

While the role of formal institutions for firm growth is already studied, there is very little research on the link between informal institutions and HGFs, let along the nexus between formal institutions and the implementation of these regulations and their joint impact on HGFs. We identify only two studies. The first looks at the role of corruption and, without surprise, finds that it is a constraint to firm growth potential: Estrin et al. (2013) study the effect of formal and informal institutions on business growth aspiration and find that higher levels of corruption, weaker property rights, and a larger government significantly constrain entrepreneurial employment growth aspirations. Krasniqi and Desai (2016), exploring the effects of a set of informal institutions and tax rates, trade and custom regulations, and business permits in transition economies, find no robust evidence of the effect of any of these factors on the share of HGFs.

Having reviewed the relevant literature, we conjecture that the quality of government might be the missing piece of the puzzle in explaining the nexus between regulations and economic outcomes such as the share of HGFs. For instance, a high quality public administration should be able to process even high levels of regulation within a short time period, thus meeting the requirements needed to create legal stability and certainty, without causing unnecessary costs to firms. Therefore, we will investigate whether a high quality regional administration can boost the share of HGFs even in a rigid regulatory environment, because a highly efficient government trades-off the burden of following complex labor- and product-markets regulations.

3 Data and descriptive results

For the empirical analysis, data on business dynamics (entry, exit, and share of high-growth firms) at the region- and 1-digit aggregate sector-level is extracted from Eurostat SBS–Business demography.[6] Regional SBS data is available at the NUTS-2 level for 21 of the 27 EU member states (data for regions in Belgium, Cyprus, Germany, Greece, Ireland, and Luxembourg is not available) and for the 2008–2020 period, although some regions only report a few years (for example, data for Polish, Slovenian, and Swedish regions is only available between 2011–2015, after 2010, or before 2018, respectively).

SBS data is matched to the regional European Quality of Government Index (QoG; 2010, 2013, 2017) at the NUTS-2 level, which was developed by the Quality of Government Institute of Gothenburg University (Charron et al., 2014, 2015, 2019) and is the only measure of institutional quality available at the regional level in the European Union. This index hinges on experiences with public sector corruption, as well as the extent to which EU citizens believe various public sector services are impartially allocated and of good quality.[7] Maps of Europe in Figure 1 display considerable subnational variation, but also show a sizeable change over time and a steady deterioration of performance in old European Union member states (Fazekas and Ágnes Czibik, 2021). Figure 4 goes one step further in showing, for each of the countries included in the final sample, the QoG levels in 2010 and 2017. If the observations are above (below) the 45 degree line, the quality of government has worsened (improved). In the majority of cases, the quality of government institutions has decreased. Notable exceptions are the Czech Republic and Poland.

Figure 2 reveals a positive relationship between the QoG index and the average share of HGFs in 2017, where southern Italian regions, like Abruzzo and Calabria (ITF1 and ITF6, respectively), have low QoG and a lower share of HGFs (less than 0.5%); in contrast, Finnish regions, like Helsinki-Uusimaa (FI1B) and North & East Finland (FI1D), have some of the highest QoG index scores and higher shares of HGFs (0.73 and 0.85 %). It is worth noticing that the average shares of HGFs are very small, ranging from 0 to 3%, with an average of just 0.5%.[8] A clear picture of the within-country and sectoral

[6]The data on regional business demography is freely available at https://ec.europa.eu/eurostat/web/regions/data/database

[7]The data is freely available at https://www.gu.se/en/quality-government/qog-data/data-downloads/european-quality-of-government-index.

[8]These figures are significantly smaller than those published by Eurostat, where "1 in 10 enterprises in the EU is recognised as high-growth companies" (source: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20171019-1); however, their analysis refers to the number of HGFs as share of active enterprises with at least 10 employees. Excluding micro businesses greatly reduces the number of active enterprises, as the same Eurostat reports that, in 2015, "9 out of 10 enterprises in the EU employed

distribution of HGFs is shown in Figure 3. For the majority of countries, the bulk of HGF shares lies between 0.2% and 0.7%. Exceptions are Estonia and the Netherlands, where, in almost 50% of their regions, more than 1% of firms are HGFs. Variation across sectors is more pronounced. Sectors with the highest concentration of HGFs are Industry (B-E), Transportation and Storage (H), and Information and Communication (J). Incidentally, these are also the most product market regulated sectors (with the highest average values of product market regulation indicator values of 3.6, 26,[9] and 3.2).

To measure product market regulation, we use the Regulatory Impact (RegImpact) Indicator developed by Égert and Wanner (2016) for the OECD (1975–2018) as a proxy. The indicator follows the same rationale of the Product Market Regulation (PMR) indicator developed by the OECD itself,[10] but has the advantage of being disaggregated by sector (NACE rev.2, 2 digits). The indicator measures the indirect impact of regulatory barriers to firm entry, business activities, and competition in the Energy, Transport, and Communication sectors on all other sectors in the economy (via intermediate trade networks), covering the 1975–2018 period. The rationale is that sectors using intermediate inputs from regulated sectors are indirectly affected. The indicator has normalized values between 0 (low regulation) and 100 (high regulation). Unfortunately, the indicator is not available for 6 countries (Bulgaria, Croatia, Latvia, Lithuania, Malta, and Romania), leaving our sample with a total of 15 countries. This sample gives us an unbalanced panel of 150 regions and 10 macro-sectors across 11 years.

It is worth noticing that regions with high QoG index scores, e.g. Finnish regions, despite their higher-than-EU average level of PMR (stringent product market regulation), have high shares of HGFs. By contrast, Italian regions have low quality of government, low PMR level (below the EU average) and have low shares of HGFs.

To measure the extent of regulation in the labor market, we use the country-level indicator "hiring and firing practices" from the The Global Competitiveness Index Historical Dataset 2007–2017 of the World Economic Forum (Version 20180712).[11] The original indicator ranges from 1 to 7 ("In your country, to what extent do regulations allow flexible hiring and firing of workers?" [1 = not at all; 7 = to a great extent]),

fewer than 10 persons." In fact, the share of HGFs is closer to the 10% of the 10% (1%).

[9]This is not a typo, transport and warehousing segments are the most affected by entry regulation and public ownership

[10]The sector PMR indicators measure the regulatory barriers to firm entry and competition at the level of individual sectors, with a focus on network industries, professional services, and retail distribution (https://stats.oecd.org/index.aspx?DataSetCode=PMR).

[11]The dataset is available by searching online for "The Global Competitiveness Index Historical Dataset 2007–2017 World Economic Forum."

but we converted it to 0—100 scale, to have comparable marginal effects. In addition to government quality, and product and labor market regulations, we control for variables that influence the emergence and growth of HGFs (as mentioned in Section 2.2), such as access to finance, churn rate, absorptive capacity (measured as regional share of engineers and scientists), share of high-tech employment, and growth of GDP per capita.

A description of all variables used in the analysis, alongside their sources and descriptions, is found in Table 1. The final sample is a strongly balanced panel data set of 1450 region-sector pairs (145 regions and 10 macro-sectors) for 10 years (2008–2017).

Table 2 reports mean, median, interquartile range (IQR),[12] minimum values, and maximum values for our variables of interest. All variables, except the growth rate of GDP per capita, range from 0 to 100. The average share (across all sectors, regions, and years) of HGFs shows that only 5.3 in 1000 firms are HGFs, with some sectors in some regions reporting no HGFs. Given that the median is only 3.7 HGF per 1000 firms clarifies that there are some outliers in the upper tail of the distribution. The government quality indicator (QoG) seems to be normally distributed, with a mean and median of 58 and 57. Its dispersion (IQR/median) is similar to that of the share of scientists and engineers (HC), albeit much greater than that of the churn and literacy rates. Table 3 gives more insights on the averages of our main variables of interest (HGFs and regulations) by groups of regions. We divide regions into 3 groups according to their level of government quality (high, medium, and low) and into 2 groups according to whether their level of QoG increased or decreased over the 2010–2017 period.

The share of HGFs increases with the level of government quality (column 'row average'). In terms of regulation, while high QoG regions are, on average, less regulated than the low QoG ones, regions with a medium quality of government are the most regulated, with the highest average product market regulation (4.65) and the lowest labor market flexibility (21.86). There are also noticeable differences between regions where the QoG deteriorated versus those where the QoG did not change or improved (i.e., as mentioned before, these are mainly regions in the Czech Republic and Poland). In particular, regions where the QoG improved, or at least did not worsen, are more subject to product market regulation while having a higher degree of labor market flexibility (measured as flexibility of hiring and firing practices). The share of HGFs is larger in regions where QoG worsened by 0.07 percentage points (ppt) compared to those regions where it improved. However, it is important to note that the majority

[12]The IQR measures the middle spread of the data. The "Quartile coefficient of variation"—IQR/median—is a useful alternative to the more standardly used coefficient of variation (standard deviation/mean), as it gives a dimensionless, thus comparable among variables, measure of relative dispersion for non-normally distributed variables.

of regions where QoG improved started from a 'low' QoG level. The HGFs share is much larger in regions with low but a positive long-term QoG growth compared to those with low QoG and negative QoG growth (0.59 versus 0.42 percent, respectively). All differences between these averages are statistically significant at the 0.01 level.

4 Empirical analysis

4.1 Estimation strategy

Using open-source data, we analyze whether government quality and regulations affect the share of high-growth firms in sector j of region r at time t with a linear regression model. More specifically, we estimate both the direct and indirect effects of the quality of institutions. As argued in section 2, the effect of labor- and product-market regulations on the share of high-growth firms may depend on the quality of regional institutions. Therefore, our estimating equation is:

$$HGF_{jrt} = \beta_0 + \beta_1 QoG_{rt-1} + \beta_2' Reg_{jrt-1} + \beta_4' X_{jrct-1} + \epsilon_{jrt} \quad (1)$$

The panel indicator is the region-sector pair rj. HGF is the share of high-growth firms; QoG and Reg are the quality of government index as well as product and labor market regulations (PMR and L flex), respectively; $X = (Access2K, HC, Churn, HTempl, \Delta GDP, Dummies)$ is a set of control variables, including access to capital, availability of human capital, churn rate, share of high tech employment, and past economic development, measured as growth rate of GDP per capita, as well as industry j, region r, country c, and year t dummies. The control variables are considered to be predetermined variables and we assume their current and lagged values are uncorrelated with the current error term ϵ_{jrt}. Additionally, all explanatory variables are lagged by one year.[13] Although we are aware that lagging the explanatory variables does not overcome the problem of reverse causality (Bellemare et al., 2017), it helps to get rid of the strong and untestable strict exogeneity assumption $E(\epsilon_{jrs}|X_{jrt}) = 0 \quad , \forall s, t$. Indeed, when dealing with institutional variables and economic outcomes, issues of endogeneity arise (Eicher and Leukert, 2009; Tabellini, 2010; Acemoglu et al., 2014). The main issue is reverse causality: institutions can influence the growth of firms in a region and, in turn, institutions can be shaped by the ability of a region to have a higher share of HGFs.

[13] We estimated the same regression model without lagging the explanatory variables and there are no major differences in the sign or the statistical significance of the coefficients. The additional estimates are available upon request.

To account for endogeneity, we adopt different strategies to select instrumental variables. The first method (GMM estimation of the fixed-effects panel data model) exploits past values of the endogenous variables. However, the validity of the time lags as instruments may be limited by the high degree of persistence of institutions. Secondly, among the established instruments for economic institutions, immediate candidates relate to historical variables. Tabellini (2010) argues and shows that historical variables, such as the literacy rate in 1880 and early political constraints on executives, isolate the exogenous variation in culture from the possibly endogenous variation in culture due to the unobserved error term. We adopt the same strategy and use the literacy rate in 1930 as an exogenous determinant of current government quality. While the Tabellini's (2010) dataset is freely available on his webpage, it only contains 69 regions, many of which belong to countries that are excluded from our sample. Therefore, we use the literacy rate in 1930 from Diebolt and Hippe (2019),[14] which covers 81 regions of 6 countries available in our sample (Austria, Spain, Finland, France, Italy, and Portugal), giving us a subsample that represents Southern, Western, and Northern Europe.

Finally, to estimate the moderating role of the quality of institutions in the relationship between regulations and the share of HGFs, we use both interaction effects ($QoG_{rt-1} \times Reg_{jrt-1}$, Table 4) and separate regressions for different levels of the index QoG (three levels chosen according to the 25th and 75th percentiles; Table 6) and different levels of the growth of the index QoG ($\Delta QoG_{2010-2017} < 0$ and $\Delta QoG_{2010-2017} \geq 0$; Table 7).

4.2 Estimation results

Table 4 presents results from the GMM estimation exploiting past values of the endogenous variables. The direct effect of government quality on the share of HGFs is positive and statistically significant: an increase of 10 points in the QoG score corresponds to an increase of 0.03 percentage points (ppt) in the share of HGFs. Given that the shares of HGFs are very small, with an average across years, sectors, and regions of only 0.53%, an increase of 0.03 ppt corresponds, in fact, to a relative increase of 5.7%. Vice versa, this also means that a decrease in the quality of government corresponds to a reduction of HGFs. In line with previous evidence on the effect of regulation on productivity (Scarpetta and Tressel, 2002; Nicoletti and Scarpetta, 2003), product market regulation is negatively related to the share of HGFs. The interpretation of all regression coefficients is similar, as all variables are scaled 0-100 (except the growth of GDP per capita): an increase in the stringency of product market regulation score of 10 points corresponds

[14] This dataset is not open access, but available upon request.

to a decrease in the share of HGFs of 0.07 ppt. A 10-point increase in labor market flexibility corresponds to an increase in the share of HGFs of 0.01 ppt.

The estimated coefficients of the control variables are consistent with prior research. More human capital, easier access to capital, faster resource reallocation via firms' churn, more employment in high-tech sectors, and past economic growth are all positively related to the regional share of HGFs. Human capital and labor market flexibility have the largest impact on the share of HGFs. An increase of 10 ppt in the regional share of scientists and engineers (labour market flexibility) corresponds to an increase of 0.17 (0.18) ppt in the share of HGFs, more than a 30% increase over the mean value of 0.53%.

Columns 2 and 3 of Table 4 display results from adding an interaction term between the quality of government and either labor market flexibility or product market regulation. The coefficient for the first interaction term is negative and statistically significant, indicating that, as the quality of regional government increases, the positive effect of labor market flexibility on HGFs diminishes. The interaction with product market regulation yields a comparable picture, where the negative effect of such regulation is offset by the higher government quality. The coefficient of the interaction is, however, small and only statistically significant at the 10%-level.

As a robustness check, we use the literacy rate in 1930 to instrument the quality of government. Table 5 reports the results of the first stage[15] regression in Column 1. To test the robustness of our results in Table 4, we run a GMM estimation for the sub-sample of regions where the literacy rate is available, but without using the literacy rate as instrument (Column 2). Column 3 reports the second stage GMM regression including the fitted value of QoG. The literacy rate is confirmed to be a significant predictor of QoG, along with all other control variables. Columns 2 and 3 look almost identical except for the effect of quality of government. The coefficient is significant only in the GMM that controls for the endogeneity with an historical variable. As the results for the smaller sample in column 3 are very similar to those in Table 4, our use of the "GMM-style" instruments is supported.

4.2.1 Heterogeneous quality of government

We further explore the heterogeneity of the impact of regulation on HGFs by estimating three separate regressions according to the average regional level of quality of government—high, medium, low. The values that define the levels are chosen using the 25th and 75th percentiles. Results are reported in Table 6. The impact of regulation on

[15]The literacy rate is a cross-sectional variable, so we cannot include it in a standard panel FE estimation, as it would drop.

the regional share of HGFs greatly varies between the three groups of regions.

The share of HGFs in regions with high quality of government is neither affected by the level of product market regulation, nor by more or less flexibility in hiring and firing practices. Among the control variables, access to capital, the churn rate, and human capital have a strong positive association with HGFs, with the latter variable being only significant in regions with high quality of government. Unlike regions with high quality administration, in regions with a medium quality of government (which is 50% of our sample), both product- and labor-market regulation regression coefficients have the signs commonly found in the literature: a negative relationship between the level of product market regulation and the share of HGFs, alongside a positive relationship between labor market flexibility and HGFs. In addition, while human capital has no influence in such regions for HGFs, again the churn rate and access to capital are important factors for increasing the share of HGFs in regions with a medium quality of government, as is in these regions the employment share in technology and knowledge intensive sectors. Thus, the well-established relationship that less regulation and more flexibility is linked to indicators of economic growth holds for regions where the quality of government is neither high nor low.

Regions with low government quality again differ from regions with a medium quality of government. There, only product market regulation is found to be statistically significant and negative: lower regulation of product markets is associated with higher shares of HGFs. More labor market flexibility is not associated with higher share of HGFs. Moreover, in these regions, past economic development (growth of GDP per capita) is, in contrast to all other regions, a strong factor influencing the increase in HGFs (a 10 ppt increase in the GDP growth rate corresponds to almost a 0.10 ppt increase in the HGFs share, which is a 23% increase over the average for low QoG regions, 0.43%). Again, in contrast to the other two groups of regions, neither the availability of human capital nor the employment share in technology and knowledge intensive sectors correlate with higher shares of HGFs, indicating that the kind of high growth firms developed there, may differ with respect to the firm strategy and organization. Most importantly, however, increases in labor market flexibility do not correspond to higher HGFs shares if the implementation is in the hands of a poorly functioning public administration.

4.2.2 Changes in the quality of government

In the final part of our analysis, we divide the sample into two groups of regions, those experiencing a deterioration in the quality of public institutions between 2010 and 2017, $\Delta QoG_{10-17} < 0$ (which as we can see from Figure 4 corresponds to the vast majority),

and those which maintained or even bettered their quality, $\Delta QoG_{10-17} \geq 0$. Table 7 displays the corresponding results. In regions where the quality of institutions decreased, rigidities in both product and labor markets have a negative effect on HGFs. In other words, the expected associations between the different kinds of regulations and the number of HGFs in a region are in place.

When we focus on regions where institutional quality improved, we observe that the level of regulations does not matter. We interpret this in the sense that, in these regions, where regional governments made efforts to increase the quality and fair allocation of public services, regulation is perceived less as an obstacle by firms, but rather as a necessary part of a well-functioning institutional framework. Compared to the first group, the regional share of HGFs is mainly influenced by human capital, employment in high technology sectors, and past economic growth.

5 Discussion and conclusions

One of the most important steps in the history of the European Union was the envisioning and creation of the single market. The free movement of goods, services, and people has brought many advantages to its member states, as businesses benefit from easier access to markets across the European Union (EC, 1996). In this context, it is often argued that a common regulatory framework at the European level with harmonized procedures for starting, running, and ending a business would be beneficial for all Member States. Yet, leading European business associations lament the uneven integration and enforcement of EU rules across the trading bloc. In a joint statement, BusinessEurope, DIGITALEUROPE, ERT, Eurochambres, and EuroCommerce[16] write that

> EU legislation too often allows for differentiated transposition in EU member states and the Commission's enforcement policy is lacking teeth against member states which introduce national rules or administrative requirements leading to further market fragmentation.

In this paper, we posit that it is not only the geographical heterogeneity of regulations but how efficiently the responsible regional governments implement these regulations that have a direct impact on the regional economic performance and may explain the heterogeneity in the shares of high-growth firms (HGFs) across European regions. Primarily using open-source data, we analyze the relationship between regulations, quality of government, and the share of HGFs at the regional level across the European Union.

[16]Link to the position paper link to paper

Our findings provide an empirical attempt at reconciling the views of public interest and public choice theories of regulation. Exploiting the heterogeneity of regulations and of quality of public administration across regions, we show that the effect of regulations on the share of HGFs also depends on the quality of government administrating these regulations. Our results allow for the interpretation that in regions with a high quality of government, labor- and product-market regulations are absorbed in a fast, efficient, and impartial way, providing firms with market stability and legal certainty. In these regions, the regional administration creates an environment where high levels of regulation are not harmful for the formation of HGFs, as less flexible hiring and firing regulations are not related to lower shares of HGFs. As mentioned in Section 2, one of the essential conditions for firm growth is the ability to recruit and train qualified personnel. HGFs and firms in general are more likely to attract skilled workers when they are able to guarantee a stable job and are willing to invest in upgrading their skills. Similarly, regulation of the product market does not hinder the formation of HGFs when in the hands of a regional administration of high quality. A high quality regional government is able to efficiently process the number of bureaucratic steps needed to manage HGFs.

In regions with medium and to a lesser extent in regions with low quality of government, we find that our results converge with the majority of empirical studies analyzing regulations and various indicators of economic performance, i.e. the less regulation the better. In these regions, more regulated markets lead to lower share of HGFs. The less efficient implementation of laws and regulations could lead to higher costs for firms, stunting their growth. Yet, more flexibility in hiring and firing leads to higher shares of HGFs only in regions with medium government quality. This positive effect disappears in regions with low quality of government. In such regions, regional governments may be implementing regulations in such an unfair or inefficient way that businesses do not perceive the more flexible labor-market regulations as improvement of the regulatory environment. In that sense, it is the quality of regional government that determines whether regulations unfold good, bad, or ugly influence on the regional share of HGFs. Hence, our results confirm the assumptions present in both the public interest theory and the public choice theory regarding the impact of bureaucracies and regulations on firm growth.

Overall, the findings of our paper suggest that for firms unnecessary delays due to time consuming procedures may result in foregone chances to become HGFs, connected to risks of losing to competitors. Delays caused by the need to process many regulations by slow moving public administration, corruption and personal interests, erroneously implemented regulatory requirements, and related procedures can cause substantial costs

to growing business. Thus, owners of potential HGFs are, therefore, likely to respond directly to regulatory barriers caused by low quality public administrations, ultimately not turning their firms into HGFs or maybe moving their firms to other regions.

These results provide new insights on the relationship between regulation, quality of government, and HGFs. The quality of regional governments is one important ingredient when evaluating the effect of regulation. A key question for future research is to better understand the enabling factors triggering the creation of a high quality government. So far, a solid understanding and empirical evidence of the background factors or long-run policies that may lead to a sustainable improvement of government quality is missing. A future avenue for research in this regard could be examining the role of financial independence of municipalities and local budgets. In Nordic countries, income taxes are paid to municipalities, triggering competition between local governments for tax-generating businesses while avoiding costly inter-group competition (Abbink et al., 2010) between municipalities for grants. As Herrmann (2022) argues, the competition between local governments for tax-generating businesses could induce economic growth by providing better services to local businesses. This suggests that market-preserving federalism (Weingast, 1995) could be the mechanism behind the sustainable transition from public choice type of governments, typically characterized by low and medium quality of government, to high-quality public interest governments.

Apart from reconciling two schools of thought on bureaucracy, regulatory complexity, and governance, our results also offer insights for European, national, and regional policy makers. To achieve convergence in the shares of HGFs across the European Union, firms should operate on a level playing field, with fair and equal conditions for competition, and with high-quality governments. Our results confirm that efforts to increase the quality of government across the European Union are needed to further increase economic cohesion across the Union (Rodríguez-Pose and Ketterer, 2020). We show that the quality of regional government affects how regulations might be perceived by HGFs. At the same time, our finding that, in regions with high quality government, rigid labor regulations have no negative impact on the growth of HGFs indicates that the success of policies aiming to create an "economy that works for people" in the European Union (Commission et al., 2020) would also need high quality government across the EU. Our paper provides further insights for those policymakers seeking to generate firm growth in regions with low government quality. The deregulation of labor markets might lead to no increase in the share of HGFs unless they start putting effort into improving the quality of regional governments. In that sense, policy makers have to make strategic decisions on whether to invest into efforts that reduce the burdens for firms connected

to their regulatory environment or into the quality of their administrative processes, as these investments may also have an impact on what kind of HGFs will be attracted into their regions.

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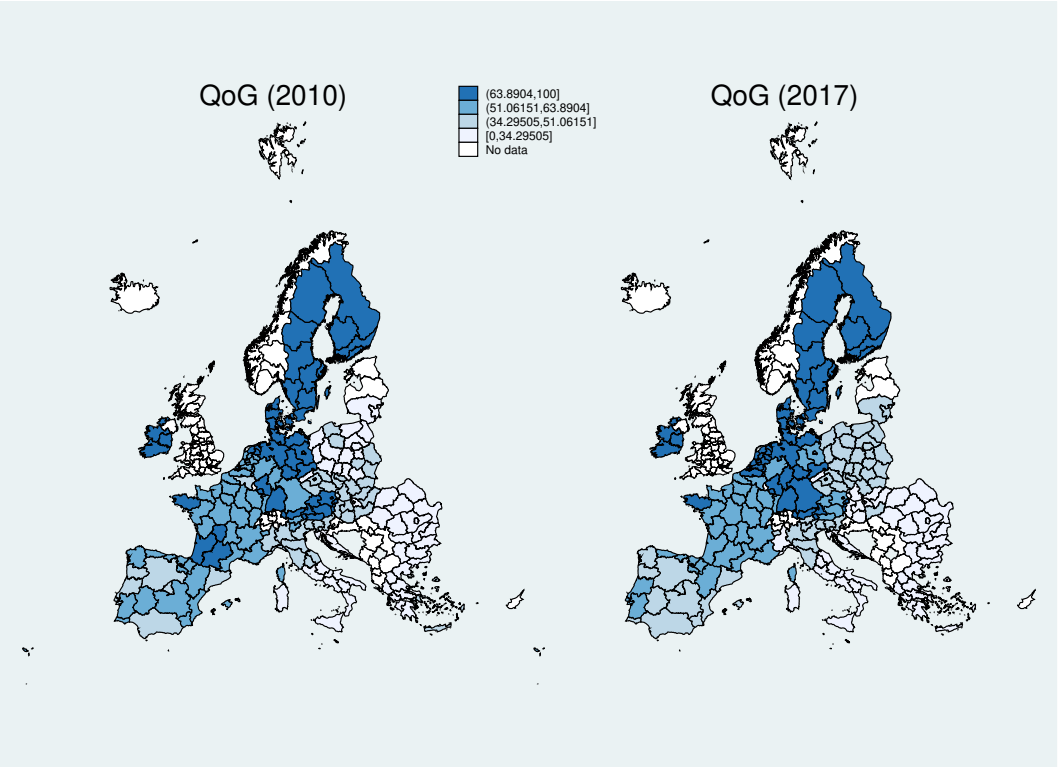
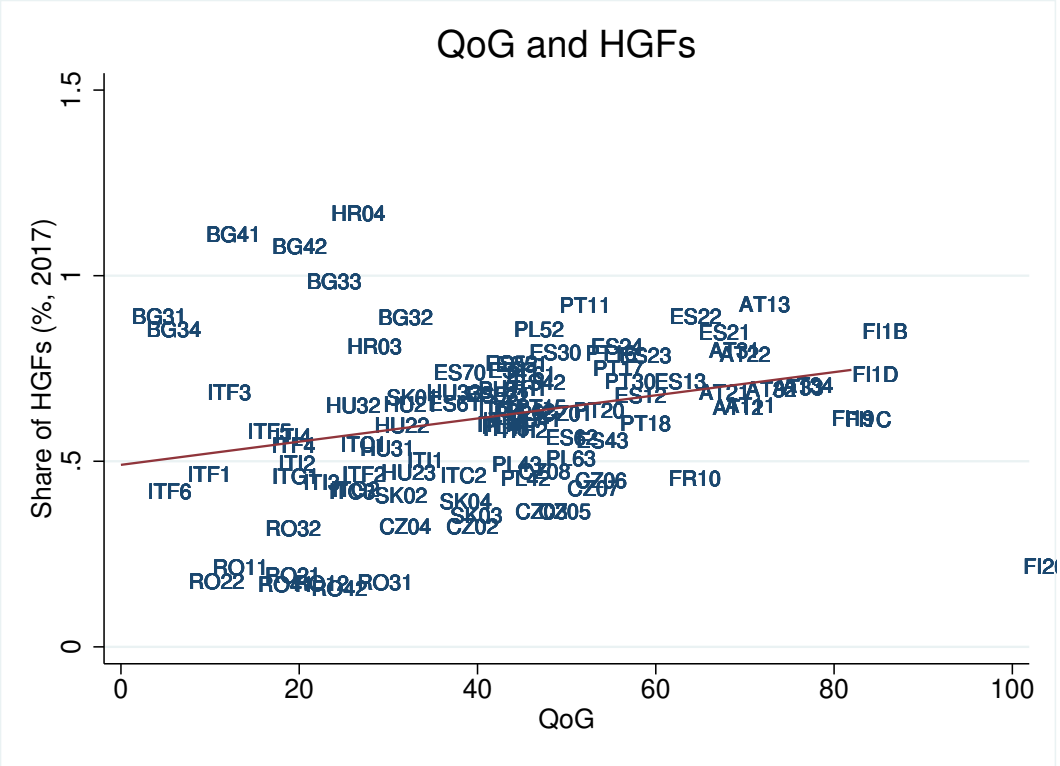
Tables and Graphs



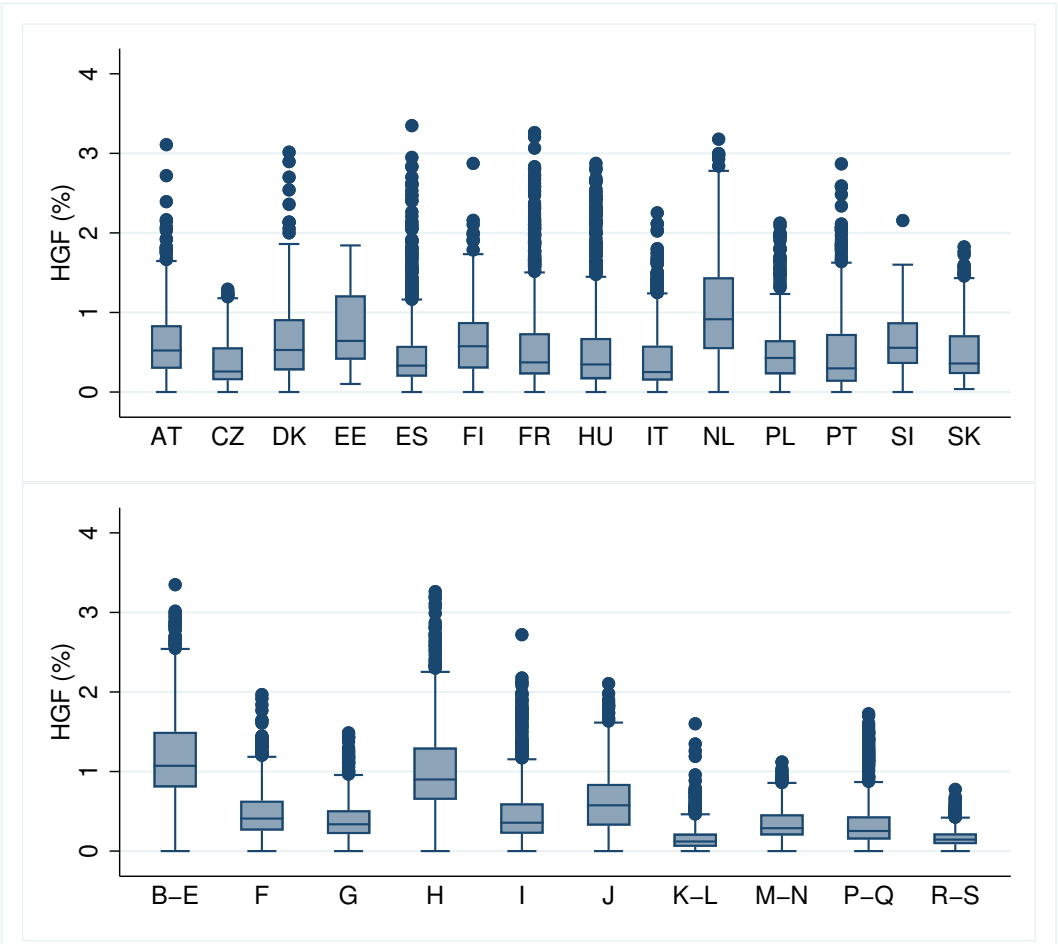
Note: Darker hues of blue indicate higher quality of government. Legend based on quartile calculation (2010).
Source: Own calculations based on European Quality of Government Index (EQI) from the QoG Institute, Gothenburg University.

Figure 1: European Quality of Government Index, 2010 and 2017



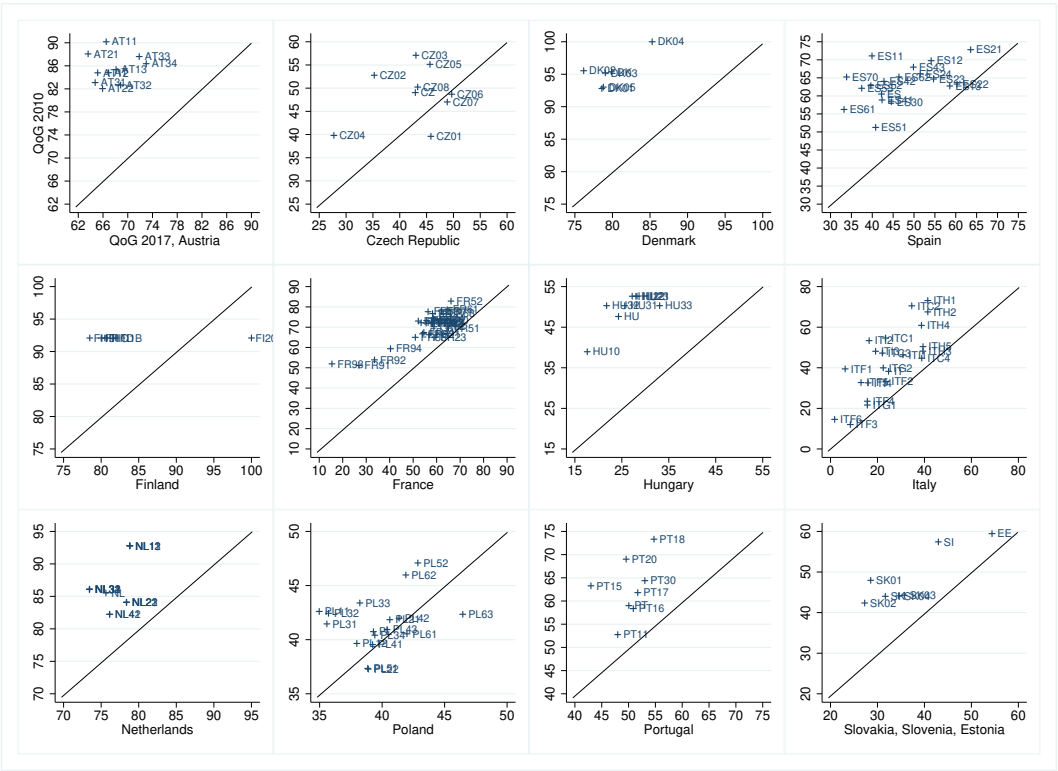
Source: Own calculations based on European Quality of Government Index (EQI) from the QoG Institute, Gothenburg University, and Eurostat–SBS data.

Figure 2: Share of High Growth Firms and Quality of Regional Government, 2017



Note: The box plots display the first quartile to the third quartile. The vertical line goes through the box is the median. The whiskers represent the the minimum and maximum.
Source: Own calculations based on Eurostat–SBS data.

Figure 3: Share of High Growth Firms by country and sector, average 2008–2017



Source: Own calculations based on European Quality of Government Index (EQI) from the QoG Institute, Gothenburg University.

Figure 4: European Quality of Government Index, by country (2010 vs 2017)

Table 1: Description of variables

Variable	*Description*	*Source*	*Sample*
HGF(%)	number of high growth enterprises measured in employment (growth by 10% or more for at least 3 consecutive years) divided by the population of active enterprises	Eurostat-SBS (BD_HGNACE2_R3)	rjt (2008–2020)
QoG	The European Quality of Government Index is based on a large citizen survey where respondents are asked about perceptions and experiences with public sector corruption, along with the extent to which citizens believe various public sector services are impartially allocated and of good quality. The index ranges from 0 to 100 (highest quality). The index is available only for the years 2010, 2013, 2017, 2021. We interpolated the missing years.	The Quality of Government (QoG) Institute, Gothenburg University	rt (2010, 2013, 2017, 2021)
PMR	Impact of the regulatory set-up in energy, e-communications and transport sectors (k), on 37 industries (j) that use the output of these sectors as intermediate inputs (w_{jk}) $$REGIMPACT_{jt} = \sum_{k=1}^{K} PMR_{kt} w_{jk}$$	OECD RegImpact	cjt (1975–2018)
L flex	Hiring and firing practice index based on the calculated score from the answers of a representative sample of business leaders in their respective countries to the following question: "In your country, to what extent do regulations allow flexible hiring and firing of workers? [1 = not at all; 7 = to a great extent]". The index has been rescaled to 0-100	The Global Competitiveness Index Historical Dataset – World Economic Forum	ct (2007–2017)
Access2K	We built a principal component-based weighted index from three separate scores* to the survey questions related to 1) ease of access to bank loans, 2) access to equity funding for financing innovative and risky projects, and 3) access to finance by issuing bonds or shares on the capital market. The index has been rescaled to 0-100	The Global Competitiveness Index Historical Dataset – World Economic Forum	ct (2007–2017)
Churn	The sum of the entry and exit rates, measured as the share of number of firms' births and deaths, over the total population of active enterprises	Eurostat–SBS (BD_HGNACE2_R3)	rjt (2008–2020)
HT empl	Employment in technology and knowledge-intensive sectors as percentage of total employment	Eurostat (HTEC_EMP_REG2)	rt (2008–2021)
ΔGDP	Growth rate of gross domestic product (GDP) per inhabitant at purchasing power standard	Eurostat (NAMA_10R_2GDP)	rt (2000–2020)
literacy1930	The share of population able to read and write in 1930. Data available only for 100 European regions	Diebolt and Hippe's (2019) based on based on Kirk's (1969) data.	r (1930)
HC	The number of scientists and engineers aged 15 to 74 as a share of the active population.	Eurostat–HRST	rt (1999–2020)

Note: r region, c country, j sector, t year

*In our preliminary analysis, we use the three indicators separately. However, they all yield similar results, which are available upon request.

Table 2: Summary statistics

variable	mean	median	IQR	Min	Max	N
HGF (%)	0.53	0.37	0.54	0	3.3	9254
QoG	58	57	31	1.8	100	13820
PMR	4.3	1.8	1.6	0.13	48	14500
L flex	27	26	19	0	100	14500
Access2K	42	42	33	0	100	14500
HC	5	4.7	2.6	1.6	14	11760
Churn	18	17	7.4	5.1	52	8935
HT empl	3.3	2.9	1.9	0.8	11	12870
ΔGDP	1.5	1.9	3.6	-14	12	14300
literacy1930	79	88	32	29	100	7800

Note: Averages across years, regions (or countries) and sectors.

Table 3: Averages of HGF (%), product and labour market regulation, by regions group

QoG	Variable	$\Delta QoG_{10-17} < 0$	$\Delta QoG_{10-17} \geq 0$	row average	N
high	HGF (%)	0.71	0.27†	0.67	2315
	PMR	3.76	4.62	3.83	
	L flex	38.67	27.90	37.77	
medium	HGF (%)	0.51	0.45	0.50	4421
	PMR	4.63	4.89	4.65	
	L flex	21.08	32.04	21.86	
low	HGF (%)	0.42	0.59	0.43	2438
	PMR	4.08	4.87	4.21	
	L flex	23.68	33.02	25.28	
column average	HGF (%)	0.53	0.42	0.53	
	PMR	4.23	4.82	4.33	
	L flex	26.24	31.57	26.77	
	N	8721	453	9174	

Note: The three levels of QoG are defined using to the regional average 25th and 75th percentiles. Variables averages across all sectors, years and within groups of regions. The number of observations refers to the minimum available for estimations.

†There are only 3 regions in the category high quality of government that experienced an increase in quality over the period 2010–2017. These are the small Finnish island Åland and Spanish Autonomous cities of Ceuta and Melilla. These averages cannot be compared with those of other groups of regions.

Table 4: IV estimation (2-step GMM)

Dep. var.: HGFs (%)	(GMM)	(GMM)	(GMM)
QoG	0.003***	0.005***	0.002***
	(0.000)	(0.000)	(0.000)
PMR	-0.007***	-0.011***	-0.012***
	(0.003)	(0.003)	(0.004)
L flex	0.001**	0.009***	0.001**
	(0.000)	(0.001)	(0.000)
HC	0.017***	0.028***	0.017***
	(0.004)	(0.004)	(0.004)
Access2K	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Churn	0.003***	0.002**	0.004***
	(0.001)	(0.001)	(0.001)
HT empl	0.007*	-0.000	0.007*
	(0.004)	(0.004)	(0.004)
ΔGDP	0.013***	0.009***	0.013***
	(0.002)	(0.002)	(0.002)
L flex#QoG		-0.001***	
		(0.000)	
PMR#QoG			0.001*
			(0.000)
R2	0.572	0.578	0.572
N	5578	5578	5578
sargan	162.468***	137.223***	163.167***
Cragg-Donald Wald F	215.655	1102.604	6139.245
Endogeneity test	11.098**	14.095***	10.789***

Note: Significance codes: p<0.01 '***', p<0.05 '**', p<0.1 '*'. Robust standard errors in parentheses. All RHS variables are lagged by one year. All econometric specifications include year, sector and region dummies.
N: Number of observations

Table 5: Literacy rate as instrumental variable

Dep.var. ⟶	QoG	HGFs (%)	HGFs (%)
literacy1930	0.101***		
	(0.010)		
QoG		-0.001	
		(0.001)	
$\hat{QoG}$			0.002**
			(0.001)
PMR	-0.018	-0.177***	-0.187***
	(0.034)	(0.053)	(0.039)
L flex	0.091***	0.003*	0.004**
	(0.010)	(0.002)	(0.002)
HC	0.295***	0.013*	0.015**
	(0.081)	(0.007)	(0.006)
Access2K	0.076***	0.007***	0.006***
	(0.009)	(0.000)	(0.000)
Churn	-0.018	0.028***	0.025***
	(0.015)	(0.002)	(0.002)
HT empl	0.177	0.016*	0.022**
	(0.143)	(0.009)	(0.010)
ΔGDP	-0.241***	-0.000	0.001
	(0.029)	(0.002)	(0.002)
R2	0.969	0.190	0.161
N	5618	4411	3848

Note: Significance codes: p<0.01 '***', p<0.05 '**', p<0.1 '*'. Robust standard errors in parentheses. All RHS variables are lagged by one year. All econometric specifications include year, sector and region dummies.
N: Number of observations
The sample used for these estimations includes only regions available in both the Eurostat and the literacy rate datasets (Diebolt and Hippe, 2019), which are regions of Austria, Spain, Finland, France, Italy and Portugal. The first column reports the results obtained from a first regression where we isolate the source of variation of institutional quality explained by literacy rate in 1930. Although not reported, the first regression includes region, sector and year dummies.

Table 6: IV GMM estimation, by level of QoG

Dep.var.: HGFs (%)	high QoG	medium QoG	low QoG
PMR	-0.015	-0.111*	-0.050***
	(0.054)	(0.065)	(0.015)
L flex	0.003	0.006***	0.001
	(0.005)	(0.002)	(0.001)
HC	0.067***	0.000	-0.012
	(0.008)	(0.010)	(0.012)
Access2K	0.003***	0.007***	0.002***
	(0.001)	(0.001)	(0.000)
Churn	0.030***	0.029***	0.003**
	(0.004)	(0.003)	(0.001)
HT empl	-0.020	0.054***	-0.025
	(0.014)	(0.019)	(0.015)
ΔGDP	-0.007***	0.002	0.009***
	(0.003)	(0.003)	(0.002)
rmse	0.209	0.192	0.148
R2	0.142	0.306	0.075
N	1396	2779	1480
Cragg-Donald Wald F	26.904	8.640	8.828

Note: Significance codes: p<0.01 '***', p<0.05 '**', p<0.1 '*'. Robust standard errors in parentheses. All RHS variables are lagged by one year. All econometric specifications include year, sector and region dummies.
N: Number of observations

Table 7: IV GMM estimation, by QoG dynamics

Dep.var.: HGFs (%)	$\Delta QoG_{2010-2017} < 0$	$\Delta QoG_{2010-2017} \geq 0$
PMR	-0.048***	-0.044
	(0.016)	(0.077)
L flex	0.004***	0.005
	(0.001)	(0.004)
HC	0.035***	0.084***
	(0.004)	(0.029)
Access2K	0.004***	-0.001
	(0.000)	(0.002)
Churn	0.017***	0.011**
	(0.001)	(0.005)
HT empl	-0.001	0.063***
	(0.008)	(0.022)
ΔGDP	0.002**	0.012**
	(0.001)	(0.006)
R2	0.127	0.493
N	5535	120

Note: Significance codes: p<0.01 '***', p<0.05 '**', p<0.1 '*'. Robust standard errors in parentheses. All RHS variables are lagged by one year. All econometric specifications include year, sector and region dummies.
N: Number of observations