

Business groups, institutions, and firm performance*

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Abstract

The aim of this paper is twofold. First, we analyse whether firms affiliated to national and international business groups outperform independent firms. Second, we investigate whether any potential performance premium associated with national and international business group membership depends on the quality of sub-national, regional institutions. Using data on Italian and Spanish manufacturing firms, we find a short-run growth premium for international business group members – while not for national business group members – with respect to independent firms. We also find that the growth premium associated with international business group membership is detected in low-quality regional institutional environments only.

Keywords

Business group membership; regional institutional quality; firm performance; Italy; Spain.

JEL Codes

D02; D22; R12.

1. Introduction

The underdevelopment of product, labour, and capital markets is a quite common phenomenon not only in developing, but also in industrialised countries. In the presence of market imperfections, the role of (national and regional) governments, public authorities, and, more generally, institutions become crucial. Under these conditions, the role of institutions is twofold. First, institutions are associated with property rights protection, public goods provision, regulation of market competition, contract enforcing mechanisms, bureaucratic transparency and efficiency, and rules for information disclosure (Streeck, 1991; Acemoglu *et al.*, 2005; Storper, 2005; Colpan and Hikino, 2010; Aisen and Veiga, 2013; Zhang *et al.*, 2016; Liang and Carney, 2020). Second, a high-quality, stable and cohesive institutional environment can help reducing transaction costs by favouring trust and reciprocity among economic agents (North, 2005).

A recent stream of literature – the so-called ‘institutional voids’ theory (Khanna and Palepu, 1997; Khanna, 2000) – has suggested that, in the presence of both market imperfections and weak institutions, a fundamental role is played by business groups. The literature has identified two main types of business groups (Colpan and Hikino, 2010): (i) the network-type business group, in which the firms belonging to this organisational model adopt the principle of alliance; (ii) the hierarchy-type business group, in which member firms are organised according to the authority principle. Following Colpan and Hikino (2010), the network-type business group is defined as a set of legally independent firms that cooperate for reaching a common long-term goal. Within these organisational structures, firms hold their autonomy and independence in terms of strategic and budgetary decisions. Examples of these types of groups are the horizontal *keiretsu* in Japan, the industrial districts/clusters in Italy (Cainelli and Zoboli, 2004), and the long-term strategic alliances in the aviation industry. On the contrary, the hierarchy-type business group is defined as an organisational model in which a holding company at the head of the hierarchy owns and controls, through equity ties, legally independent firms, generally organised as subsidiaries or affiliates.

In this paper, the type of business group, used to empirically test the ‘institutional voids’ theory,

is defined as a set of legally independent firms owned and controlled through equity ties by an entrepreneur or a family (Cainelli and Iacobucci, 2011). In this sense and according to the definition of Colpan and Hikino (2010), the groups analysed in this paper are hierarchy-type business groups. Specifically, we consider two forms of this type of business group: ‘national’ and ‘international’ business groups. A business group is classified as ‘national’ if the head of the group and all the affiliated firms are located in the same country, while it is classified as ‘international’ if it also includes firms located in other countries. Compared to ‘national’ business groups, ‘international’ business groups are generally more efficient and productive, and tend to adopt advanced technologies and better managerial and organisational practises. The main reason is that these global companies, operating in several foreign markets, may incur in higher fixed costs. The additional fixed costs associated with international activities materialise in gathering new information (e.g., on the country’s legal system, or consumers’ habits), setting up and developing distribution/commercial networks, and adapting processes, technologies, products, and services to foreign (technical) specifications and regulations (Barba Navaretti and Venables, 2004; Helpman *et al.*, 2004).

Business groups are not uncommon in advanced economies. Comparing the assets and the market capitalisation of the largest business groups to the economic size of a sample of industrialised countries, Morck (2009) shows that these organizational models are widely spread. For example, in Europe they are particularly widespread in countries such as Sweden, Portugal, Belgium, France, Norway, Germany, Italy, and Spain. Nonetheless, this organisational form is also common in ‘late-industrialising’ countries such as Brazil, China, Chile, India, Indonesia, Malaysia, Pakistan, Philippines, and South Korea (Kali, 2003; Morck, 2009; Colpan and Hikino, 2010; Lee *et al.*, 2016; Zhang *et al.*, 2016).

In these emerging economies, as well as in some southern European countries – such as Portugal, Italy, and Spain –, market inefficiencies and low-quality institutions are predominant. Business groups are generally seen as an ‘alternative’ organisational solution to market and institutional failure problems, as their inter-firm relations facilitate the exchange of production inputs,

managerial and financial resources (the so-called internal capital market), organisational practices, routines, production standards, and behavioural norms. In other words, business groups can fill ‘institutional voids’ (Castellacci, 2015). With specific reference to East Asian countries, Chang (2006: 413) supports this insight by arguing that “business groups are creatures of market imperfections, government intervention, and socio-cultural environment”.

As institutions and markets evolve and become more efficient, business groups may lose their *raison d’être*, such that the positive effects associated with business groups may disappear. For example, when the South Korean economy became more mature and developed, also thanks to the liberalisation of financial markets occurred in the 1990s, the advantages associated with business groups became less important (Khanna and Palepu, 1997).

Given these remarks, our theoretical expectation is that the economic performance of firms operating in a region characterised by a ‘weak’ institutional environment will be affected by the membership to a business group, in particular, to an ‘international’ business group. On the contrary, we expect that membership to a business group does not represent a key factor pushing firms’ economic performance in regions characterised by high-quality institutions.

The aim of this paper is to test these hypotheses. First, we analyse whether and to what extent firms affiliated to national and international business groups, respectively, outperform independent firms in terms of turnover, value added, and employment growth over the period 2010-2013. Second, we analyse whether any potential performance premium for national and international business group members varies across sub-national, regional environments which exhibit different degrees of institutional quality.

We consider a sample of manufacturing firms from Italy and Spain, two industrialised countries, both characterised by strong economic and political integration within the European Union (EU), and, at the same time, high sub-national institutional heterogeneity. We employ firm-level data drawn from the EU-EFIGE/Bruegel-UniCredit (EFIGE, henceforth) dataset together with region-specific measures of institutional quality (University of Gothenburg).

Our empirical analysis provides two interesting results. First, we find evidence of a performance premium for firms affiliated to international business groups with respect to independent firms, while, by contrast, we do not find evidence of a short-run growth premium for national business group members with respect to independent firms. Second, we find that the premium characterising international business group members with respect to independent firms depends on the quality of the regional institutional environment. Indeed, the estimated performance premium associated with international business group membership is detected only in regions with low-quality institutions, and tends to diminish moving from low-quality to high-quality regional institutional environments up to the point that any advantages related to the membership to an international business group seem to disappear.

This paper is an attempt to contribute to the most recent debates on the role of both business groups and regional institutions in influencing firm-level economic performance from a completely new perspective. First, we complement previous country-level studies on the role of business groups by providing evidence at the sub-national, regional level. To the best of our knowledge, this is the first contribution analysing the ‘institutional voids’ perspective by comparing different regions within the same country, and, particularly, regions characterised by a different degree of institutional quality. Second, we complement previous empirical evidence on developing and emerging economies with novel evidence on European industrialised countries. In particular, Italy and Spain provide a suitable research ground to test the ‘institutional voids’ perspective. In fact, both countries present significant institutional differences among their regions (e.g., Charron *et al.*, 2014), and, in addition, business groups emerge as key actors characterising their industrial systems (e.g., Cainelli and Iacobucci, 2011). According to new evidences for 2016 drawn from the *Amadeus* database (Bureau van Dijk), 28,879 and 16,708 business groups operate in Italy and Spain, respectively.¹ The average size – defined by the number of affiliated firms – of these groups is 3.9 in Italy and 4.3 in Spain. In other words, the business groups’ size in these two countries is very similar. Moreover, the share of ‘international’ business groups in Italy and Spain is almost identical. In fact, about 41% of Italian

groups are ‘international’ since they operate in 175 foreign countries, while the share of Spanish ‘international’ groups is about 42% – these business groups operate in 168 foreign countries. Finally, the industrial distribution of business groups in Italy and Spain shows a similar pattern, with a strong concentration in manufacturing and wholesale and retail trade (Tables S1 and S2, Supplementary Material). Some differences may be detected only when we consider this distribution at the manufacturing level. These differences reflect differences in the industrial specialisation pattern of these two European countries.

Finally, our analysis may have relevant policy implications, considering the role that EU, national, and regional policy-makers are ascribing to regional institutional improvements as a mean to reduce socio-economic inequality and promote economic development.

The rest of the paper is organised as follows. Section 2 discusses the literature related to this topic. Section 3 describes the dataset and outlines the empirical strategy. Section 4 presents and discusses the empirical results. Finally, Section 5 concludes and draws some policy implications.

2. Related literature

A recent stream of literature has suggested that business groups play a fundamental role in the presence of both market imperfections and weak institutions. Not surprisingly, this type of firm is widely spread in developing and emerging countries such as Brazil, China, Chile, India, Indonesia, Malaysia, Pakistan, and South Korea (Kali, 2003; Fisman and Khanna, 2004; Lee *et al.*, 2016; Zhang *et al.*, 2016), which are characterised by inefficiencies in the product, labour, and financial markets, as well as by low-quality political and juridical institutions (Khanna and Palepu, 1997; Khanna, 2000; Cainelli and Iacobucci, 2011). By dominating the private sectors of these countries, business groups – such as *chaebols* in Korea, *business houses* in India, (horizontal) *keiretsu* in Japan, and *grupos economicos* in Latin America (Khanna and Palepu, 1997) – can be seen as a valuable ‘organisational solution’ for solving problems arising from market and institutional failures (Kali, 2003).

This stream of literature – the so-called ‘institutional voids’ theory – suggests that business

groups are able to address market imperfections, low-quality institutions, opportunistic behaviours, and weak contract enforcement. This is possible because these companies may internalise many relationships and processes generally managed through markets and institutions (Wang *et al.*, 2015; Liang and Carney, 2020). In other words, the hierarchy-type business groups – those analysed in this paper – are able to overcome market and institutional failures through the internalisation of some of the mechanisms characterising them (Xavier *et al.*, 2014).²

As already mentioned, the ‘institutional voids’ theory assumes that markets do not work efficiently in most emerging and developing countries since they are characterised by a high level of imperfections (Zattoni *et al.*, 2009; Manikandan and Ramachandran, 2015). In the product markets of these countries, problems of information and communication between buyers and sellers – due to the lack of information infrastructures such as consumer-information agencies – may generate higher transaction costs. Since these problems of information and communication are generally lower within a business group, this type of firm may mitigate these problems (Khanna and Palepu, 1997).

Similarly, in the financial system, the absence of efficient capital markets and reliable financial reporting may create financing constraints for firms (Khanna and Palepu, 1997). Such inefficiencies can be solved within the business group, as the latter can more easily get access to financial resources than small independent firms (Castellacci, 2015). In fact, business groups are not only larger, but also enjoy better financial position and reputation. Moreover, business groups can exploit the so-called internal capital market, that consists in the transfer of financial resources among the units of the same group. Lack or low availability of skilled workers can be another characteristic of most developing countries. Business groups may substitute some functions of the labour market by providing internal management development programs for managers and executives, or vocational training programs for all workers (Khanna and Palepu, 1997). Finally, limited contract enforcement, weak rule of law, corruption, criminality, inefficiencies in the judicial system, and other institutional deficiencies (Khanna and Yafeh, 2007) can lead to a weak and inadequate institutional environment. In all these cases, business groups may fill the ‘voids’ created by these institutional failures by mobilising

financial and management resources within the different units of the group. In other words, business groups, serving as ‘transactional arenas’, may compensate for missing or low-quality market-supporting institutions (Liang and Carney, 2020).

The ‘institutional voids’ theory is also focussed on the ‘dynamic’ dimension of the relationship between markets, institutions, and business groups (Zattoni *et al.*, 2009; Castellacci, 2015). The rationale is that the role of business groups decreases as markets and institutions become more developed and efficient (Castellacci, 2015). In fact, the evolution of the institutional environment can radically change the positive effects associated with business groups. In the early phases of the ‘institutional transition’, the role of business groups may be relevant because they facilitate the exchange of production inputs, mobilise managerial and financial resources, organisational practices, routines, and set behavioural norms. In the late phases, instead, business groups lose these advantages. In other words, when a country reaches a sufficiently high level of development of its markets and institutions, the business group loses its role. Some papers have supported this hypothesis. Zattoni *et al.* (2009), using a sample of 547 Indian business groups observed over the period 1990-2006, show that the performance of group-affiliated firms tends to decrease as the institutional environment evolves. A superior performance of firms belonging to business groups was reached only in the early stages of the development of the Indian economy, i.e., when the country was characterised by market imperfections and low-quality institutions. By contrast, in the late phases of the ‘institutional transition’, this advantage was lost. Using a sample of Latin American business groups, Castellacci (2015) finds a similar result, and confirms that the “source of groups’ superiority decreases” when institutions become more efficient (Castellacci, 2015: 45). A partially contrasting result is found by Liang and Carney (2020). Using a dataset drawn from the World Bank Enterprise Surveys for a sample of 60 countries between 2006 and 2016, Liang and Carney (2020) analyse management practice differences between independent and group-affiliated firms at different stages of institutional maturity. Specifically, they show that some management practises, which differentiate these two types of firms in the early stages of development, do not disappear with the emergence of market-

supporting institutions. Indeed, some of these practices – such as those related to aggregation and distribution of capital and non-financial resources, and those for enhancing credibility (reputation, quality certification, financial statements certified by external auditors) – persist even in a mature institutional context. In this sense, the business group seems to offer benefits to its affiliates in different stages of the institutional development of a country, and not only in the early stages. The evidence provided by Liang and Carney (2020) suggests a more complex interpretation of the ‘institutional voids’ theory.

Moving from this theoretical perspective, we attempt to complement previous country-level empirical evidence on developing and emerging economies with novel evidence at the regional level on industrialised countries. First, by explicitly distinguishing between national and international business groups, we analyse whether firms affiliated to business groups outperform independent firms. Second, we exploit sub-national, regional heterogeneity in institutional quality in Italy and Spain to investigate whether any potential advantages associated with national and international business group membership vary conditional on the regional institutional environment.

Italy and Spain constitute an ideal testing ground of our research hypotheses. First, both countries present a high degree of regional heterogeneity that translates into within-country disparities in terms of institutional settings, together with relevant regional differences in terms of socio-economic conditions. Indeed, regions with low- and high-quality institutions coexist in both countries, and both Italy and Spain are characterised by the presence of regions that occupy relatively high and low positions in the EU ranking in terms of institutional quality. In particular, while Italy is characterised by a long-standing North-South divide – with high-quality institutions characterising Northern regions –, the spatial distribution of regions with low- and high-quality institutions emerges in Spain without a clear spatial pattern (Charron *et al.*, 2014). Second, the business group appears as an organisational form of particular relevance in both Italy and Spain. Firm-level data drawn from the *Amadeus* database – already presented and discussed in the introductory section of the paper – show that the share of firms belonging to national and international business groups, respectively, is

very similar in Italy and Spain. Furthermore, statistical testing on the mean difference in the distribution of national and international business group members by manufacturing sector in Italy versus Spain confirms this type of similarity.³ Because of these characteristics and similarities, Italy and Spain provide an ideal research ground to test the ‘institutional voids’ theory and to extend this framework from developing to industrialised countries.

Such analysis is relevant also in light of the increasing attention that regional, national, and supranational (e.g., EU) policy-makers are giving to the role of regional institutions as a mean to promote socio-economic and industrial dynamism, in particular in less developed regions (Farole *et al.*, 2011; Rodríguez-Pose, 2013; Charron *et al.*, 2014).

3. Empirical framework

3.1 The dataset

The empirical analysis employs Italian and Spanish firm-level data drawn from the EFIGE dataset, which provides survey information – collected in the year 2010, and referring to the period 2007-2009 – on ownership structure, employment, investments, innovation, research and development (R&D), internationalisation, finance, market and pricing, as well as balance sheet data of the interviewed firms drawn from the *Amadeus* database.⁴

The cleaning procedure was performed to match the research questions investigated in the paper, and, thus, to maximise the sample size. First, we considered only active manufacturing firms reporting non-missing information on business group membership, innovation, R&D, international activity, investments, and credit conditions. Second, we combined the information on industry, geographical location, and year of incorporation, as well as data on turnover, value added, and employment for the period 2010-2013 already available in EFIGE with updated data drawn directly from *Amadeus*. This allowed us to fill data gaps, where possible, and double-check the data consistency. The Bureau van Dijk identification number available in EFIGE was used to match the two data sources. Regarding the geographical dimension, we take into account the level 2 of the

Nomenclature des Unités Territoriales Statistiques (NUTS) adopted by the EU. This choice is driven by the fact that the region-level institutional data employed in the empirical analysis are available at the abovementioned geographical level of disaggregation. The adopted geographical unit of analysis reflects the administrative regions with effective institutional powers influencing local institutional and economic conditions in both Italy and Spain (Ketterer and Rodríguez-Pose, 2018; Ganau and Rodríguez-Pose, 2019; Rodríguez-Pose and Ganau, 2021).

The cleaning procedure left us with a sample of 3,104 firms. The final sample covers all NUTS-2 Italian regions, while the NUTS-2 Spanish autonomous cities of Ceuta and Melilla, and the Balearic Islands are not covered due to data availability issues.⁵ Moreover, all manufacturing industries are covered in the sample, except for the NACE Rev. 2 industry “CD – Manufacture of coke and refined petroleum products” (Table S5, Supplementary Material).

3.2 The empirical model

We empirically test, first, whether a performance premium – defined in terms of turnover, value added, and employment short-run growth over the period 2010-2013 – exists for firms belonging to national and international business groups, respectively, with respect to independent firms; second, whether and to what extent any advantages associated with the national and international business group organisational form vary across regional environments characterised by varying institutional quality. We rely on the following Gibrat (1931)-type growth equation:

$$\Delta Y_{imrc} = \alpha + \beta Firm\ Type_{imrc} + \gamma Institution_{rc} + \delta (Firm\ Type_{imrc} \times Institution_{rc}) + \sum_{k=1}^K \zeta_k X_{imrc}^k + \sum_{l=1}^L \theta_l X_{rc}^l + \vartheta_m + \lambda_c + \varepsilon_{imrc} \quad (1)$$

where $\Delta Y_{imrc} = \log(Y_{imrc}^{2013}) - \log(Y_{imrc}^{2010})$ denotes the growth in either turnover, value added, or employment of firm i operating in industry m and located in region r in country c over the period 2010-2013.⁶

The term $Firm\ Type_{imrc}$ denotes a three-level categorical variable capturing a firm's membership to a national or an international business group, if any. Formally, the variable is defined as follows:

$$Firm\ Type_{imrc} = \begin{cases} 0, & \text{if independent firm} \\ 1, & \text{if national business group member} \\ 2, & \text{if international business group member} \end{cases} \quad (2)$$

such that it takes a value of zero in the case of an independent firm ($Independent\ Firm_{imrc}$), i.e., a firm that is not affiliated to a business group; a value of one if a firm belongs to a national business group ($National\ Group\ Member_{imrc}$); and a value of two if a firm belongs to an international business group ($International\ Group\ Member_{imrc}$). As already specified, a business group is classified as 'national' if the head of the group and all the affiliated firms are located in the same country – either Italy or Spain –, while it is classified as 'international' if it comprehends also firms located in countries different from the one the surveyed firm belongs to – i.e., if either the head of the group or other affiliated firms are located in countries different from Italy (for Italian surveyed firms) and Spain (for Spanish surveyed firms).⁷ The type of independent firm is set as the reference category when estimating Equation (1) in order to evaluate the growth premium of national and international business group members, respectively, with respect to independent firms.

The term $Institution_{rc}$ denotes the variable capturing the quality of the institutional environment of region r in country c in the year 2009. Regional institutional data are drawn from the European Quality of Government Index (EQI) dataset provided by the Quality of Government Institute of the University of Gothenburg. The dataset is based on survey information collected in the year 2010 on a sample of 34,000 citizens, and refers to individuals' perception and experience with corruption, quality, and impartiality with respect to education, public health care, and law enforcement in their own region – see Charron *et al.* (2013) and Charron *et al.* (2014) for details.⁸ Following Charron *et al.* (2014), we aggregated individual survey questions into four main

institutional pillars p , namely rule of law, government effectiveness, voice and accountability, and fight against corruption. Then, we constructed the index of regional institutional quality as the average value of the abovementioned four pillars:

$$Institution_{rc} = \left(\sum_{p=1}^4 Institutional\ Pillar_{prc} \right) / 4 \quad (3)$$

We then normalised the index in Equation (3) in the interval $[0, 1]$ to facilitate its interpretation. Thus, the value of the institutional variable increases as the quality of regional institutions increases. The assumption is that a regional context where public services are managed and delivered efficiently, impartially, and in an un-corrupted manner by the local government is likely to improve the socio-economic environment where firms operate, to increase the security of business activities, to favour trust among local economic actors, thus reducing transaction costs and, consequently, facilitating market and inter-firm transactions. Hence, a favourable institutional environment is likely to promote firms' performance and growth (e.g., Lasagni *et al.*, 2015; Ganau and Rodríguez-Pose, 2019; Tran *et al.*, 2020).⁹

The term $Firm\ Type_{imrc} \times Institution_{rc}$ denotes the interaction term between the three-level categorical variable for firm type defined in Equation (2) and the region-specific variable capturing institutional quality. Formally – and given the three-level nature of the categorical variable capturing whether a firm is independent, or belongs to a national business group, or to an international business group –, this variable allows us to estimate two interaction terms having set the type of independent firm as the reference category: first, an interaction term between national business group membership and regional institutional quality, to evaluate whether any potential growth premium for national business group members with respect to independent firms varies depending on the quality of regional institutions; second, an interaction term between international business group membership and regional institutional quality, to evaluate whether any potential growth premium for international

business group members with respect to independent firms varies depending on the quality of regional institutions.

The vector X_{imrc}^k in Equation (1) includes a set of firm-specific control variables. Variables that are common to the turnover, value added, and employment growth equations are: (i) the growth-initial value of employment in logarithmic form; (ii) an age measure (defined as 2010 minus the year of a firm's incorporation) in logarithmic form; (iii) four dummy variables capturing the introduction of product innovations only, process innovations only, both product and process innovations, and the investment in R&D activities during the period 2007-2009; (iv) a dummy variable capturing the investment in capital goods during the period 2007-2009; (v) a categorical variable capturing the 'complexity' of the internationalisation strategy during the period 2007-2009 defined in terms of export, import, and production abroad (including proprietary, non-proprietary, and sub-contracting forms), and which takes a value of zero for non-internationalised firms, a value of one for firms adopting a one-mode internationalisation strategy, a value of two for firms adopting a two-mode internationalisation strategy, and a value of three for firms adopting a three-mode internationalisation strategy; (vi) a dummy variable capturing whether a firm has suffered from credit rationing in the year 2009, and which takes a value of one if a firm was willing to ask for more credit to financial institutions and, having effectively asked for, did not receive it. The right-hand side of the turnover growth equation includes also the growth-initial value of turnover in logarithmic form; the right-hand side of the value added equation includes also the growth-initial value of value added in logarithmic form; and the right-hand side of the employment growth equation includes also the growth-initial value of turnover in logarithmic form.

The region-level vector X_{rc}^l in Equation (1) includes a variable for gross domestic product (GDP) per capita and a variable for population density (defined as population per square kilometre), both referring to the year 2010 and expressed in logarithmic form. These two variables proxy for market size effects, and capture the overall economic performance of a region and agglomeration-related forces.¹⁰ Finally, the term $\boldsymbol{\vartheta}_m$ denotes a set of industry dummy variables aimed at capturing

industrial specificities; the term λ_c denotes a country dummy variable for Italy, which is aimed at capturing country-level dimensions (e.g., taxation, juridical system); and ε_{imrc} denotes the error term.¹¹

3.3 Estimation strategy

Equation (1) can be easily estimated via Ordinary Least Squares (OLS). First, it is estimated without accounting for the potential mediation effect of regional institutional quality – i.e., by excluding the term $Firm\ Type_{imrc} \times Institution_{rc}$ from Equation (1) – to analyse whether a growth premium exists for national and international business group members, respectively, with respect to independent firms. Second, the full version of Equation (1) is estimated via OLS to test whether and to what extent any potential growth premium for national and international business group members, respectively, with respect to independent firms is affected by the quality of regional institutions – i.e., whether any potential national and international business group-related advantage varies across regions characterised by different levels of institutional quality.

However, potential endogeneity issues related to both business group membership and regional institutional quality could bias the OLS estimation of Equation (1). With respect to business group membership, reverse causality could emerge if the best performing firms – i.e., those that systemically record higher growth rates – are more likely to be affiliated to national and, even more, international business groups rather than being stand-alone. With respect to regional institutional quality, endogeneity could arise due to several reasons: first, region-specific shocks could affect both the quality of the local institutional environment and the economic performance of local firms; second, spatial sorting-related effects could be in place if the best performing firms tend to locate in regions characterised by a better institutional environment; finally, measurement errors are likely because capturing the quality of regional institutions is a hard task, and the institutional variable employed in the empirical analysis is only a proxy for a broader and more complex phenomenon. In addition, an omitted variable bias could arise as Equation (1) controls for many but not all the possible firm-,

region- and industry-specific factors which could determine firms' economic performance.

We therefore rely on an instrumental variable (IV) approach through a Two-Stage Least Squares (TSLS) estimator. On the one hand, we deal with potential endogeneity of national and international business group membership by relying on two IVs. Following Cainelli *et al.* (2020), we consider as a first IV the log-value of a firm's total assets averaged over the period 2003-2007 ($\overline{Assets}_{imrc}^{2003-2007}$) – i.e., before the period of observation of both our survey data and the dependent variables. The rationale underlying the IV is that the likelihood of belonging to a national or an international business group tends to increase with firm size. Indeed, looking at our sample, we can observe that international business group members are, on average, 1.9 (1.7) times larger in terms of employment (total assets) than national business group members, which, in turn, are, on average, 4.7 (6.9) times larger than independent firms – with international business group members being, on average, 8.7 (11.9) times larger than independent firms. However, the IV is not expected to be correlated with our three dependent variables for short-run growth: indeed, empirical evidence shows either that the growth rate of a firm is independent from its growth-initial value (e.g., Wagner, 1994; Lensink *et al.*, 2005), or that smaller firms tend to grow faster and more than larger firms (e.g., Hall, 1987; Johansson, 2004).

The second IV for national and international business group membership is derived from the previous one. It is defined as the difference between a firm's average total assets and the average value of total assets of all the other firms – observed in our sample – of the same type (i.e., either independent, or national business group member, or international business group member) as the reference firm (*Similarity to Type*_{imrc}). This second IV is used as a proxy for the similarity between a sample firm and the 'average firm' of the same type. Its rationale relies on the fact that a firm that is, on average, more similar to the profile of its own type is more likely to be of that particular type – i.e., being either an independent firm, or member of a national business group, or member of an international business group. We do not expect this IV to be directly correlated with our three dependent variables for short-run growth, as, by construction, it simply captures the 'distance'

between a firm and the (exogenously-defined) profile of its own type.

On the other hand, we deal with potential endogeneity of regional institutional quality by exploiting variations in regional literacy rate during the 1870s. Historical region-level literacy rate is likely to be a relevant predictor of the current regional institutional environment, being historical educational levels highly correlated with subsequent nation- and region-level changes of institutions, political setting, culture, and social capital (e.g., Glaeser *et al.*, 2004; Akçomak and ter Weel, 2009; Tabellini, 2010). Despite the historical nature of literacy rate in the 1870s could make it an exogenous phenomenon with respect to the current performance of individual firms, exogeneity could be violated if past education and literacy differentials across regions have long-lasting effects, thus affecting current regional output and economic performance. However, we partially address this issue by controlling for current levels of regional GDP per capita in our empirical model. The region-level variable capturing historical literacy rate in the 1870s ($Literacy Rate_{rc}^{1870s}$) is defined using Italian data drawn from Flora (1983), that refer to the percentage of literate population (able to read only) aged five years or more in 1871, and Spanish data drawn from Núñez (1990), that refer to the percentage of literate population (able to read and write) aged ten years or more in 1877.¹²

3.4 Characteristics of sample firms

Table 1 reports the sample distribution by firm type and country. Firms which do not belong to either a national or an international business group represent the 79.8% of the sample, and they are the majority in both Italy (78.8%) and Spain (80.6%). Firms belonging to a national business group represent the 11.7% of the sample (12.9% of Italian firms, and 10.7% of Spanish firms), while firms belonging to an international business group represent the 8.5% of the sample (8.3% of Italian firms, and 8.7% of Spanish firms).

[Table 1 near here]

Table 2 provides details on the positioning of business group members within their own business group. Looking at national business group members, 16.5% of firms acts as the head of its own business group; 20% of firms is controlled by another firm, but also controls one or more firms in the group; and 63.5% of firms is only controlled by another firm in the group. Looking at international business group members, 3.4% of firms acts as the head of its own business group; 37.3% of firms is controlled by another firm, but also controls one or more firms in the group; and 59.3% of firms is only controlled by another firm in the group.

[Table 2 near here]

Table 3 presents a series of firm-specific characteristics which could help understanding differences in firm performance. The first interesting insight concerns firms' performance in terms of turnover, value added, and employment growth during the period 2010-2013. About 69% of firms belonging to international business groups has recorded a strictly positive turnover growth, while the share of independent firms characterised by a positive growth rate is about 58%. A similar value characterises the category of national business group members (about 57%). A similar pattern characterises also the growth in value added: indeed, a strictly positive growth rate has been recorded by about 51% of international business group members, 46% of national business group members, and 44% of independent firms.

A slightly different picture emerges with respect to employment growth. In this case, in fact, the percentage of firms that have recorded a strictly positive growth rate is quite close among the three types of firms: 47.4% of independent firms; 48.6% of national business group members; and 46.8% of international business group members. This evidence could be related to the fact that international business group members are, on average, larger (302 employees) and older (27 years of activity) than firms in the other two categories. Thus, the possibility to exploit internal scale economies, together with a greater experience in the market, may help a firm to perform better in

terms of turnover and value added growth, without the need to further increase the size of the workforce.

In addition, firms belonging to international business groups seem to be more likely to invest in capital goods (92%) than firms in the other two categories, with returns in terms of increased production capacity. They also seem to be more likely to introduce product innovations (23%) or a combination of both product and process innovations (44%), as well as to invest in R&D activities (72%) than firms in the other two categories. By contrast, independent firms (22.7%) and national business group members (22.3%) tend to introduce only process innovations more than international business group members (13.7%). Investments in R&D activities, especially if resulting in the creation of new or improved products, can potentially translate into higher competitiveness and larger market shares, and, consequently, greater growth rates. By contrast, process innovations, in particular if incremental rather than radical, are likely to improve the internal efficiency of a firm, without having a direct impact on its sales or the value added generated.

Interestingly, only 3.8% of international business group members is not directly involved in international activities in the form of either export, import, or production abroad (including proprietary, non-proprietary, and sub-contracting forms). This share increases to 21.2% for national business group members, and to 32.9% for independent firms. Looking at the complexity of the internationalisation strategy, the share of independent firms relying on only one internationalisation mode (either export, import, or foreign production) is 37.6%, while only about 2% of independent firms relies on a three-mode internationalisation strategy – i.e., a combination of export, import, and foreign production. Similarly, 3.6% of national business group members relies on a three-mode internationalisation strategy, while, on the contrary, 25.9% of international business group members relies on a three-mode internationalisation strategy. The ‘complexity’ of international openness may contribute to explain the relatively better turnover and value added growth performance recorded by international business group members.

Finally, the share of international business group members which has requested credit to

financial institutions without receiving it is about 4.9%, i.e., lower than the share of national business group members (6.9%) and independent firms (8.6%). Even marginally, such little difference in credit rationing among the three categories may help explaining the higher performance which has characterised international business group members, as greater credit availability may translate into the possibility of carrying out more investments to push economic performance.

This descriptive analysis confirms that international business groups are generally more efficient since they are more capital intensive, adopt advanced technologies, and implement more complex internationalisation strategies. This is a common feature with multinational enterprises, useful for understanding some of our empirical findings.

[Table 3 near here]

4. Empirical results

Table 4 reports the results of the OLS and TSLS estimation of the simplified and full versions of Equation (1) with respect to turnover, value added, and employment growth. Looking at the TSLS results, it is worth highlighting that first-stage multivariate F statistics (Sanderson and Windmeijer, 2016) on the excluded instruments are higher than the conservative cut-off value of 10, thus suggesting a good predictive power of the chosen IVs.¹³ Moreover, the full version of Equation (1) including the interaction terms between national and international business group membership, respectively, and regional institutional quality is specified as an over-identified equation. Indeed, the set of excluded instruments is defined by the three IVs for a firm's average total assets, the similarity between a firm and its peers of the same type, and regional literacy rate in the 1870s, plus a two-way interaction term between a firm's average total assets and regional literacy rate, a two-way interaction term between the similarity between a firm and its peers of the same type and regional literacy rate, and a three-way interaction term among all the three IVs. The p-value of the Hansen's (1982) J statistic for over-identifying restrictions is never statistically significant, thus suggesting that the

instruments are jointly valid.

Looking at the simplified version of Equation (1) – Specifications (1), (3), (5), (7), (9), and (11) –, the first interesting result is that firms belonging to an international business group record a premium in terms of short-run growth with respect to independent firms. By contrast, there is no evidence of advantages related to national business group membership.¹⁴ This finding is not surprising, rather it confirms that – at least in Italy and Spain – the birth and growth patterns of national business groups – generally, small-sized groups – may have different reasons. For example, this type of group can be used as an organisational mechanism with the aim of maintaining the ‘legal’ size of each member under some threshold value (in Italy, 15 employees). In other cases, national business groups may act as ‘devices’ to reduce the transparency towards the fiscal authority (Cainelli and Iacobucci, 2007).

The second interesting result concerns the evidence of a positive and statistically significant association between regional institutional quality and firm-level economic performance, suggesting that firms are better off when operating in a local context characterised by a ‘good’ institutional environment – a result that corroborates previous analyses (e.g., Lasagni *et al.*, 2015; Ganau and Rodríguez-Pose, 2019; Rodríguez-Pose *et al.*, 2021). In particular, the OLS and TSLS results are consistent with respect to all the three economic performance dimensions considered.

The OLS and TSLS estimates of the full version of Equation (1) – Specifications (2), (4), (6), (8), (10), and (12) – are quite consistent with respect to short-run growth in turnover, value added, and employment. The results highlight a negative and statistically significant estimated coefficient of the interaction term between membership to an international business group and regional institutional quality, while the interaction term concerning national business group membership shows a negative but statistically negligible coefficient. The estimated negative and statistically significant coefficient of the interaction term between international business group membership and regional institutional quality suggests that any growth premium of international business group members with respect to independent firms tends to diminish as the quality of regional institutions increases.¹⁵

[Table 4 near here]

In order to better clarify this last result, Table 5 reports the estimated short-run growth premium of national and international business group members, respectively, with respect to independent firms obtained from the estimated interaction terms presented in Table 4, but evaluated at different percentiles of the distribution of the regional institutional quality variable. On the one hand, the results confirm the absence of any performance advantages of national business group members with respect to independent firms. On the other hand, the results highlight that the growth premium characterising international business group members with respect to independent firms diminishes as the regional institutional environment improves, up to the point that any advantages arising from international business group membership seem to disappear. In other words, our results suggest that the organisational form of the international business group provides affiliated firms with advantages leading to a performance premium with respect to independent firms only in those regional environments characterised by low-quality institutions. By contrast, the membership to an international business group seems to lose its relevance in high-quality regional institutional settings, such that the associated growth premium tends to disappear.

Our findings, consistently with the ‘institutional voids’ theory, support the idea that the benefits related to international business group membership decrease as the quality and efficiency of markets and institutions improve. The first main novelty of our paper is that we are able to show how this pattern can occur even within a single industrialised country when regions are characterised by different levels of institutional quality. In this case, when regions reach a sufficiently high level of development and maturity of their institutions, the business group loses its advantages. The second main novelty is that we are able to identify this dynamic by distinguishing between national and international business groups. In fact, while the literature on the ‘institutional voids’ is generally focussed on the business group as a ‘substitute’ of institutions and markets, we show that this result

holds only for a ‘specific’ type of group, i.e., the international one. Only these types of business groups – which are generally more efficient and productive, adopt advanced technologies, as well as better managerial and organisational practises – seem to have a role in the case of weak institutions and inefficient markets. This can be considered another interesting finding of our analysis.¹⁶

[Table 5 near here]

5. Conclusions

This paper has investigated the empirical relationship between business group membership and firms’ economic performance by distinguishing between national and international business groups, and by exploiting heterogeneity in sub-national, regional institutional quality. Using a large sample of Italian and Spanish manufacturing firms, together with a region-specific index of institutional quality, we have analysed, first, whether national and international business group members, respectively, outperform independent firms, and, second, whether and to what extent any potential premium associated with national and international business group affiliation varies across regions characterised by different levels of institutional quality.

First, we find evidence of a short-run growth premium for international business group members with respect to independent firms, while this is not the case for firms belonging to a national business group. Second, we find that the advantages arising from international business group membership diminish as the quality of the regional institutional environment improves. In other words, international business groups seem to lose their economic relevance over independent firms in regional contexts characterised by high-quality institutions with respect to those where low-quality institutions prevail.

Our findings have two interesting implications. First, this study has analysed Italy and Spain, which are two European industrialised countries with a (sufficiently) high level of institutional quality and market efficiency. However, it is generally recognised that these two countries are characterised

by strong geographical disparities. In this sense, this paper is an attempt to contribute to the debate from a completely new perspective, i.e., by comparing different regions within the same country, and, particularly, regions characterised by a different degree of institutional quality. To the best of our knowledge, this is the first contribution in this direction. In other words, we show that the role played by international business groups diminishes as regional institutions become more efficient. In this vein, our analysis opens up a new regional perspective to the debate about the economic role and effects of business groups.

Second, our evidence has relevant policy implications. Since international business groups become less important in high-quality regional institutional environments, place-based policies should take into account this dimension. Policy measures aimed at promoting the formation or the enlargement of business groups (for example, through the acquisition of other firms, or the location of foreign-owned subsidiaries) might have a role only under specific conditions. According to our findings, a key condition is that markets and institutions do not work efficiently. In ‘weak’ institutional contexts, business groups may act as ‘substitutes’ for the institutional void. On the contrary, when the local institutional environment evolves, this type of organisational form loses its positive effects on firms’ performance.

Endnotes

1. Recently, a new dataset of European business groups has been built for the year 2016. This dataset, taken from the *Amadeus* database, is based on ownership information for joint stock companies and their subsidiaries, and includes only business groups with headquarters and subsidiaries located in the European continent.
2. This type of business group, when compared with ‘hybrid’ organisations in the sense of the Transaction Cost Economics (Williamson, 1975, 1985; Granovetter, 1985), is not able to economise, like any bureaucratic unitary firm, on bureaucratic costs.
3. The p-value of the t-test concerning the sectoral distribution of national business group

members in Italy versus Spain is equal to 0.240, while it is equal to 0.199 when considering international business group members. It is worth noting that this exercise has been performed using data drawn from the *Amadeus* database, with national and international business group membership identified using information on firms' ownership structure.

4. The EFIGE dataset covers approximately 15,000 manufacturing firms (with at least 10 employees) operating in Austria, France, Germany, Hungary, Italy, Spain, and the United Kingdom (Altomonte and Aquilante, 2012). For some recent contributions using the EFIGE dataset, see, *inter alia*, Accetturo and Giunta (2016), Maietta *et al.* (2017), Materia *et al.* (2017), and Cainelli *et al.* (2018).
5. The final sample covers firms in 21 NUTS-2 Italian regions and 16 NUTS-2 Spanish regions. It represents about the 54% of the EFIGE firms operating in Italy and Spain. Despite Italian (Spanish) firms are slightly under-represented (over-represented) – see Table S3 (Supplementary Material) –, the size distribution of firms in the final sample is close to the EFIGE one (Table S4, Supplementary Material).
6. Turnover and value added data were deflated using a country-specific, one-digit industry-level deflator provided by Eurostat.
7. The EFIGE survey explicitly asks firms whether they belong or not to a business group, as well as whether this business group is 'national' or 'international'. To complement this information, firms are asked whether they control and/or are controlled by other national and/or foreign firms. Thus, the categorical variable for business group membership is defined by combining these sets of information.
8. The EQI dataset represents the best available source to analyse institutional factors at the sub-national level in the EU. Indeed, it has been employed by all the empirical contributions analysing the effects of local institutions on both region-level (Ketterer and Rodríguez-Pose, 2018; Rodríguez-Pose and Ganau, 2021) and firm-level (Ganau and Rodríguez-Pose, 2019) economic performance in the EU.

9. Figure S1 (Supplementary Material) maps the spatial distribution of the regional institutional index, and shows how both Italy and Spain present a high level of within-country heterogeneity. In particular, Italy is characterised by a striking North-South divide, while high-quality regions coexist with low-quality ones in Spain without a clear spatial pattern. This spatial configuration is in line with the EU-level analysis provided by Charron *et al.* (2014).
10. Regional data are provided by Eurostat.
11. Table S6 (Supplementary Material) reports definition and data source of all the variables entering the empirical model. Table S7 (Supplementary Material) reports some descriptive statistics of the dependent and the continuous explanatory variables. Table S8 (Supplementary Material) reports the correlation matrix of the explanatory variables.
12. The individual correlation coefficients between each IV and each potentially endogenous variable are relatively large, positive, and statistically significant, with p-values equal to 0.000 (Table S9, Supplementary Material). The individual correlation coefficients between each IV and each dependent variable for firm performance are relatively small and also negligible from a statistical viewpoint (Table S10, Supplementary Material).
13. The first-stage multivariate F statistic proposed by Sanderson and Windmeijer (2016) represents an improvement of that proposed by Angrist and Pischke (2009) to account for the simultaneous presence of multiple endogenous regressors.
14. We have tested for a potential growth premium of international business group members with respect to national business group members by estimating the simplified version of Equation (1) on a reduced sample defined by excluding independent firms, and setting the type of national business group member as the reference category. The OLS estimates are reported in Table S11 (Supplementary Material), and suggest that international business group members tend to outperform national business group members.
15. We have performed a series of exercises to test the robustness of the main findings. First, we have tested the robustness of our identification strategy for national and international business

group membership by considering a third IV, namely the share of the ultimate owner of a firm. Following Cainelli *et al.* (2019: 956), the rationale underlying this additional IV (*Ultimate Owner_{imrc}*) is that the share of the ultimate owner tends to be significantly higher in controlled firms – i.e., in firms belonging to (national or international) business groups – than in independent firms, and acts as “a sort of ‘group marker’”. Looking at our sample, this share is equal, on average, to 81.8% for international business group members, 69% for national business group members, and 49.9% for independent firms. Moreover, the IV capturing the share of the ultimate owner shows positive and statistically significant correlation coefficients with respect to the endogenous variables for national and international business group membership, while relatively small and statistically negligible correlation coefficients with respect to the three dependent variables for turnover, value added, and employment growth (Tables S12 and S13, Supplementary Material). The results of this exercise are reported in Table S14 (Supplementary Material), and fully corroborate the main findings. Second, we have replicated the TSLS estimation of the full version of Equation (1) by removing highly collinear variables from the growth equations. Specifically, the growth-initial employment variable has been removed from the turnover and value added growth equations, while the growth-initial turnover variable has been removed from the employment growth equation. The results of this exercise are reported in Tables S15 (Supplementary Material), and confirm the main ones. Third, the TSLS estimation of the full version of Equation (1) for turnover and value added growth has been estimated by replacing the growth-initial employment variable with size dummy variables for small (10 to 49 employees), medium (50 to 249 employees), and large (250 employees or more) firms referring to the year 2010. The results of this exercise are reported in Tables S16 (Supplementary Material), and confirm the main ones.

16. We have also tested the validity of our results by considering a measure of innovativeness rather than performance measures. Indeed, several contributions show how business group members tend to be more innovative than independent firms (e.g., Mahmood and Mitchell, 2004;

Belenzon and Berkovitz, 2010; Hsieh *et al.*, 2010; Castellacci, 2015). Specifically, we have relied on Probit and IV linear probability model (IV-LPM) estimation approaches using as dependent variable a binary variable capturing whether a firm has introduced product and/or process innovations in order to test, first, whether a premium exists for national and international business group members, respectively, with respect to independent firms, and, second, whether this potential innovation premium diminishes as regional institutional quality improves. The innovation measure has been regressed on: the three-level categorical variable for firm type, with the type of independent firm set as the reference category; the regional institutional quality variable; the interaction term between the three-level categorical variable for firm type and the regional institutional quality variable, with independent firms set as the reference category; firm- and region-level control variables; a country dummy variable for Italy; and a set of industry dummy variables. The results of this exercise are reported in Table S17 (Supplementary Material), and confirm those obtained on firm performance. First, we find evidence of an innovation premium for international business group members – while not for national business group members – with respect to independent firms. Second, we find a negative and statistically significant coefficient of the interaction term between international business group membership and regional institutional quality, suggesting that any innovation advantages associated with the membership to an international business group decrease as the quality of regional institutions improves.

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Table 1: Sample distribution by firm type and country.

Firm Type	Italy		Spain		Total	
	No.	%	No.	%	No.	%
Independent Firms	1,108	78.81	1,369	80.62	2,477	79.80
Business Group Members	298	21.19	329	19.38	627	20.20
National Group	182	12.94	182	10.72	364	11.73
International Group	116	8.25	147	8.66	263	8.47
Total	1,406	100.00	1,698	100.00	3,104	100.00

Notes: Percentage values are defined on column totals.

Table 2: Positioning of firms within national and multinational business groups.

Firm Positioning	National Group Members		International Group Members	
	No.	%	No.	%
Head of Group	60	16.48	9	3.42
Controlled by Another Firm, and Controlling Other Firms	73	20.05	98	37.26
Controlled by Another Firm	231	63.46	156	59.32
Total	364	100.00	263	100.00

Notes: Percentage values are defined on column totals.

Table 3: Firm-level characteristics by firm type.

Firm Characteristics	Firm Type		
	Independent Firms	Business Group Members	
		National Group	International Group
Positive Growth Rate (2010-2013)			
Turnover	58.46%	57.42%	69.20%
Value Added	43.68%	45.06%	50.95%
Employment	47.36%	48.63%	46.77%
Size Class			
Small (10-49 employees)	87.04%	53.85%	31.56%
Medium (50-249 employees)	11.83%	28.30%	33.84%
Large (≥ 250 employees)	1.13%	17.85%	34.60%
Average Size			
No. of Employees (mean value)	34.92	162.67	302.32
Average Age			
Years of Activity (mean value)	24.27	23.31	26.99
Investments			
Investment in Capital Goods	88.37%	90.66%	92.02%
Innovativeness			
Only Product Innovation	19.82%	20.33%	23.19%
Only Process Innovation	22.73%	22.25%	13.69%
Both Product and Process Innovation	26.04%	35.7%	44.11%
R&D Investment	48.20%	65.66%	71.86%
Internationalisation Mode			
Not Internationalised	32.94%	21.15%	3.80%
One Mode	37.63%	33.52%	22.81%
Two Modes	27.45%	41.76%	47.53%
Three Modes	1.98%	3.57%	25.86%
Credit Rationing			
Credit Constrained	8.64%	6.87%	4.94%

Notes: Percentage values are defined on the total number of firms within each firm type category.

Table 4: OLS and TSLS estimates on turnover, value added, and employment growth.

	$\Delta\text{Turnover}_{imrc}$				$\Delta\text{Value Added}_{imrc}$				$\Delta\text{Employment}_{imrc}$	
	OLS		TSLS		OLS		TSLS		OLS	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Member_{imrc}	-0.021 (0.031)	0.055 (0.096)	0.009 (0.050)	0.184 (0.189)	-0.013 (0.029)	0.053 (0.074)	-0.012 (0.023)	0.189 (0.224)	0.012 (0.020)	0.108 (0.083)
Member_{imrc}	0.138** (0.066)	0.438** (0.174)	0.192*** (0.064)	0.550** (0.254)	0.088*** (0.027)	0.210**** (0.058)	0.115**** (0.022)	0.381** (0.165)	0.062*** (0.020)	0.098* (0.053)
	0.107* (0.063)	0.140 (0.088)	0.319** (0.163)	0.433*** (0.137)	0.122* (0.066)	0.145** (0.071)	0.218** (0.102)	0.254** (0.101)	0.110** (0.045)	0.130*** (0.041)
Institution_{rc}	...	Ref.	...	Ref.	...	Ref.	...	Ref.	...	Ref.
$\text{Member}_{imrc} \times \text{Institution}_{rc}$	...	-0.131 (0.180)	...	-0.375 (0.307)	...	-0.123 (0.146)	...	-0.412 (0.402)	...	-0.237 (0.166)
$\text{Member}_{imrc} \times \text{Institution}_{rc}$	...	-0.531* (0.312)	...	-0.733* (0.428)	...	-0.229* (0.116)	...	-0.501* (0.286)	...	-0.165* (0.086)
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	3,104	3,104	3,104	3,104	3,104	3,104	3,104	3,104	3,104	3,104
	0.03	0.04	0.03	0.02	0.09	0.09	0.06	0.06	0.07	0.14
	0.02	0.03	0.02	0.01	0.08	0.08	0.05	0.05	0.06	0.13
Excluded IV [p-value]										
Institution_{rc}	...	...	20.24 [0.000]	41.87 [0.000]	...	...	29.28 [0.000]	42.44 [0.000]	...	...
$\text{National Group Member}_{imrc}$	...	...	79.55 [0.000]	68.40 [0.000]	...	...	79.56 [0.000]	67.90 [0.000]	...	...
$\text{National Group Member}_{imrc}$	...	...	54.34 [0.000]	39.36 [0.000]	...	...	53.96 [0.000]	38.66 [0.000]	...	...
$\text{Member}_{imrc} \times \text{Institution}_{rc}$	...	...	...	52.89 [0.000]	...	...	...	52.82 [0.000]	...	...
$\text{Member}_{imrc} \times \text{Institution}_{rc}$	...	...	...	32.06 [0.000]	...	...	...	31.84 [0.000]	...	...
(e)	...	...	...	0.896	...	...	...	0.734	...	...

0.05; *** $p < 0.01$; **** $p < 0.001$. Standard errors are clustered at the NUTS-2 level, and are reported in parentheses. All specifications include a constant term. (“Ref.”).

Table 5: Disentangling the premium of business group members with respect to independent firms over regional settings of varying institutional quality.

Independent variable	$\Delta\text{Turnover}_{imrc}$		$\Delta\text{Value Added}_{imrc}$		$\Delta\text{Employment}_{imrc}$	
Modeling Specification in Table 4	(2)	(4)	(6)	(8)	(10)	(12)
Estimation Method	OLS	TSLS	OLS	TSLS	OLS	TSLS
Premium of National Group Member versus Independent Firm						
Quality of Institution _{rc}						
1 st Percentile	0.055 (0.096)	0.184 (0.189)	0.053 (0.074)	0.345 (0.318)	0.108 (0.083)	0.508 (0.441)
25 th Percentile	0.006 (0.041)	0.043 (0.079)	0.007 (0.030)	0.099 (0.105)	0.019 (0.029)	0.119 (0.116)
50 th Percentile	-0.019 (0.037)	-0.028 (0.039)	-0.017 (0.031)	-0.025 (0.029)	-0.026 (0.027)	-0.026 (0.027)
75 th Percentile	-0.026 (0.042)	-0.049 (0.037)	-0.024 (0.035)	-0.062 (0.049)	-0.039 (0.033)	-0.039 (0.033)
99 th Percentile	-0.051 (0.067)	-0.119 (0.073)	-0.047 (0.057)	-0.185 (0.151)	-0.084 (0.060)	-0.084 (0.060)
Premium of International Group Member versus Independent Firm						
Quality of Institution _{rc}						

1 st Percentile	0.438** (0.174)	0.550** (0.254)	0.210**** (0.058)	0.482* (0.279)	0.098* (0.053)	0.4 (0.2)
25 th Percentile	0.239*** (0.075)	0.276*** (0.107)	0.124**** (0.028)	0.223** (0.092)	0.036 (0.029)	0.1 (0.0)
50 th Percentile	0.139** (0.059)	0.137** (0.064)	0.081** (0.030)	0.092** (0.040)	0.004 (0.024)	-0.0 (0.0)
75 th Percentile	0.109* (0.064)	0.096 (0.067)	0.068** (0.033)	0.053 (0.056)	-0.005 (0.025)	-0.0 (0.0)
99 th Percentile	0.009 (0.104)	-0.042 (0.119)	0.025 (0.050)	-0.076 (0.143)	-0.036 (0.033)	-0.2 (0.1)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Standard errors are clustered at the NUTS-2 level, and are reported in parentheses. The estimated effects are of the interaction terms between the variables for regional institutional quality and national and international business group membership, respectively, reported in Table