It's all about culture! Institutional context and ownership concentration across Europe

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A B S T R A C T

It is widely recognised that the formal institutional context affects firm ownership concentration. However, the impact of the informal institutional context has received less research attention. Drawing from institutional theory, we tested our hypothesis that both the formal and informal (cultural) institutional contexts simultaneously influence firm ownership concentration. Based on a firm-level database of the largest 600 listed companies in 19 European countries for the period 2009–2015, we found that both formal and informal institutional contexts, considered independently from each other, affect the level of firm ownership concentration. However, when these institutional contexts are considered together, the significance of the formal institutional context's effect on ownership concentration disappears while the informal (cultural) institutional context remains significant. Specifically, our findings indicate that high power distance, collectivism, uncertainty avoidance, restraint, and short-term orientation favour firm ownership concentration. Overall, our findings demonstrate that the diversity in European cultures explains firms' different levels of ownership concentration across European firms, signalling that the European Union's efforts towards a common regulatory frame may not necessarily lead to a convergence of European firms' ownership structures and, consequently, of corporate governance practices.

1. Introduction

Ownership structure is a key dimension of corporate governance because a firm's owner determines the nature of the agency problems that the firm may suffer (Kumar & Zattoni, 2017). Thus, understanding the determinants of firm ownership concentration (defined as the shareholdings held by significant shareholders) may help in designing the most appropriate corporate governance mechanisms to reduce and balance the risk of agency problems, potential conflicts among shareholders and managers (Type I), and potential conflicts among large and minority shareholders (Type II). Although ownership concentration is one of the most common corporate governance mechanisms worldwide (Faccio & Lang, 2002), it is well established that the level of firm ownership concentration is unevenly distributed across countries (Aguilera & Crespi-Cladera, 2012). For instance, in Europe, despite the supranational influence of the European Union (hereafter EU), who has made increasing efforts to secure common legislation, firm ownership concentration is not homogenous across countries.

Since the seminal article published by La Porta, Lopez-De-Silanes, and Shleifer (1999), various studies (e.g. Denis & McConnel, 2003; Martinez-Garcia, Basco, Gomez-Anson, & Boubakri, 2020) have reported that the formal institutional context is important for ownership concentration. The dominant conclusion is that shareholders' ownership concentration operates as a mechanism that fills institutional voids in countries with less developed institutional contexts or with weak protection of minority shareholders; that is, ownership concentration is a mechanism to protect investors from agency problems. However, the relationship between the formal institutional context and firm ownership concentration has also been questioned because of the omission of other dimensions of context such as the informal institutional context (Holderness, 2017). Existing studies show that informal institutions affect political outcomes (Ang & Fredriksson, 2018; Helmke & Levitsky, 2004), individuals' economic activities and their capital accumulation (Méon & Sekkat, 2015), and, consequently, also affects firm corporate

governance practices such as board independence and women's presence on boards (Grosvold & Brammer, 2011), compliance decisions (Rejchrt & Higgs, 2015), and the quality of corporate governance practices (Chan & Cheung, 2012).

Nevertheless, the progress made to explain the importance of the informal institutional context on corporate governance, that is, the effect of cultural context on firm ownership concentration, has received less attention. In recent studies, Licht, Goldschmidt, and Schwartz (2005) and Stulz and Williamson (2003) revealed how religion and national culture explain country-level differences in investor protection. Griffin, Guedhami, Li, Chuck, and Shao (2018) documented that individualism is positively associated with firm-level corporate governance scores, whereas uncertainty avoidance is negatively associated with it. Holderness (2017) made a significant contribution by showing that the egalitarianism dimension of culture is a significant determinant of ownership concentration, displacing the significance of the formal institutional context. Therefore, following this research stream and the call made by Boyd and Solarino (2016), our research aims to analyse the determinants of ownership concentration by exploring the effect of both the formal and informal institutional contexts in Europe. Drawing on institutional theory, we hypothesise that in developed countries – contexts where institutions have already achieved an appropriate level of quality of governance – cultural aspects determine firm ownership concentration.

Using a database of firms in the STOXX Europe 600 Index, we analysed the ownership concentration of listed firms from 19 European countries in the period 2009–2015. We manually constructed a database of 3954 firm-year observations and found evidence of an overwhelming importance of the informal institutional context, measured using Hofstede's cultural dimensions (1980, 2001) to determine ownership concentration. Specifically, our findings indicate that high power distance, collectivism, uncertainty avoidance, restraint, and short-term orientation favour firm ownership concentration. In this sense, our results are consistent with Holderness's (2017) conclusion that focusing solely on the formal institutional context, as most previous research has done (e.g. La Porta et al., 1999), could lead to biased interpretations when analysing the determinants of ownership concentration because of the omission of cultural context.

Our study has several contributions for theory and practice. First, in line with Holderness (2017) and Lu, Song, and Shan (2018), we extended existing studies, which mainly focussed on the formal institutional context (e.g. Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008; La Porta et al., 1999), by investigating the effect of both the formal and informal institutional contexts on firm ownership concentration. Our study implements two important improvements over existing research: first, we constructed theoretical arguments to define the impact of all six of Hofstede's cultural dimensions (1980, 2001), thus extending Chakrabarty's (2009) arguments that theorised on only two of them; second, we empirically tested the cultural effect on firm ownership concentration by creating a cultural index through a principal component analysis (PCA) methodology – extending Holderness's (2017) work which considered only one of Hofstede's dimensions. On the other hand, we broaden the current knowledge using different temporal analysis. While Holderness (2017), for example, uses data from the 1990s, our data cover the period after the 2008 global crisis, providing a current depiction of the importance of the formal and informal institutional contexts in determining firm ownership concentration.

Second, our article facilitates a context-sensitive research approach to context theorising (Bamberger, 2008; Krueger, Bogers, Labaki, & Basco, 2021) to better understand the circumstances that constrain or shape the phenomenon under study. In this sense, we contribute to the literature that analyses the relationship between different cultural dimensions proposed by Hofstede (1980, 2001) and firm behaviour and corporate governance characteristics (e.g. Chan & Cheung, 2012; Grosvold & Brammer, 2011; Humphries & Whelan, 2017; Rejchrt & Higgs, 2015; Zengin & Guneri, 2016). Consequently, this research

contributes to institutional theory (North, 1990) by refining the importance of the cultural context for economic activities, specifically for firm ownership concentration.

Finally, our study also has practical implications for policy makers. Europe exemplifies the varieties of capitalism across countries (Hall & Soskice, 2001), constituting an interesting laboratory for analysing the differences and similarities between the formal and informal institutional contexts and their impact on firm ownership concentration, aspects that remain understudied in developed countries (Estrin & Prevezer, 2011). Despite Europe's move towards a more formal institutional homogeneity due to the supranational nature of the EU, firm ownership concentration is uneven across the continent. Cross-cultural differences are evident in Europe (Waarts & van Everdingen, 2005) and our study reveals that culture is a determinant of ownership concentration. Therefore, our study provides a new understanding for policy makers by highlighting that context-sensitive approaches applied to policies may be significant for producing the expected impact.

The remainder of this paper is organised as follows. Section 2 covers the theoretical background linking institutional context to firm ownership concentration. Section 3 describes the database, variables, and methodology employed in the study. The results are presented in Section 4, while Section 5 concludes.

2. Institutional context and firm ownership concentration

Firm ownership concentration is considered a corporate governance mechanism that may reduce agency problems (principal-agent problem) in dispersed ownership corporations (Jensen & Meckling, 1976). However, there is evidence that in countries with weak legal protection for investors, ownership concentration engenders alternative agency problems, such as principal-principal problems, affecting corporate governance structures (Desender, Aguilera, Crespi, & García-Cestona, 2013) and firm performance (Villalonga & Amit, 2006). Despite the extensive investigation of the consequences of ownership concentration, research regarding what determines ownership concentration across countries remains unanswered. To address this question, we used the institutional theory lens, which posits that context determines shareholder preferences regarding the level of ownership concentration in which economic activities are internalised within the boundaries of the firm. Therefore, institutions, which may be classified as formal or informal, constitute the constraints for political, economic, and social interaction (North, 1990) influencing firm ownership (Holderness, 2016, 2017; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998).

2.1. The formal institutional context

The formal institutional context refers to the hierarchy of political/judicial law, economic rules, and contracts. Its influence on corporate governance and firm strategies has received considerable attention in the economic-finance literature. For example, research has focussed on the quality of different contextual dimensions such as legal protection systems (Burkart, Gromb, & Panuzi, 2006; Doidge, Karolyi, & Stulz, 2007; La Porta et al., 1998), labour institutions (van Essen, van Oosterhout, & Heugens, 2013), securities laws (Guedhami & Pittman, 2006), political systems (Roe, 2003), and/or the legal environment (Durnev & Kim, 2006). It was observed that weak formal institutional contexts, which are usually linked to civil legal origin and low governance, enhance agency problems both between owners and managers (Type I) and between majority and minority shareholders (Type II). Such problems often lead shareholders, who have particular interests in the firms they invest in, to increase their shareholdings in order to overcome institutional voids (Bhagat, Black, & Blair, 2004), preserve their participation, and protect their investments, power, and influence on the firm. Thus, ownership concentration is a response to a weak formal institutional context (La Porta et al., 1998; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2008). The weaker the legal protection (as in

civil-law countries) and governance, the higher the level of ownership concentration (Djankov et al., 2008; La Porta et al., 1998, 2000).

Based on these arguments, we propose the following hypothesis:

H1. . The weaker the formal institutional context, the higher the firm ownership concentration.

2.2. The informal institutional context

Despite the theoretical importance of the formal institutional context in predicting ownership concentration, ownership concentration is unevenly distributed across countries with similar formal institutional contexts. For instance, in Europe, which has a high level of formal institutional integration (convergence) due to the EU project, prior studies have shown that firm ownership concentration varies significantly across countries (Faccio & Lang, 2002). In line with Holderness (2016, 2017), we argue that the formal institutional context is one contextual dimension that may determine the level of ownership concentration; however, there are other alternative dimensions of context, such as the role of the informal institutional context, particularly culture, that may influence investor decisions on whether to concentrate their position in the firm.

Informal institutions influence the operation of formal institutions (Helmke & Levitsky, 2004; Williamson, 2000); for instance, 'the same formal rules and/or constitutions imposed on different societies produce different outcomes' (North, 1990, p. 36). Within the informal institutional context, cultural aspects impact individuals who must determine how economic opportunities will be exploited. This 'how' is related to the manner in which economic actors participate within organisational boundaries. Following Hofstede (1991, p. 4), we interpret culture as 'the collective programming of the mind distinguishing the members of one group or category of people from others'. Prior studies suggest that the culture in Europe determines individuals' perceptions (Neyer & Harzing, 2008), a firm's competitive advantages (van den Bosch & van Prooijen, 1992), and a firm's innovation strategies (Waarts & van Everdingen, 2005), among other individual and firm behaviours.

Despite the relevance that existing research has granted to the informal institutional context (Roe, 1994), it is challenging to specify 'the informal ways by which human beings have structured human interaction' (North, 1990, p. 36) and the theoretical link between cultural context and ownership concentration (Pedersen & Thomsen, 1997). Further, despite the absence of mature theoretical knowledge to predict the link between the informal institutional context and ownership concentration (De Jong & Semenov, 2006; Sauerwald & Peng, 2013), one research stream has attempted to connect the formal and informal institutional contexts by integrating empirical findings to develop a theory (Holderness, 2017). In this sense, some empirical studies have analysed the relationship between different cultural dimensions and corporate governance characteristics such as board independence, gender composition (e.g. Grosvold & Brammer, 2011), corporate governance codes (e.g. Humphries & Whelan, 2017), compliance decisions (e.g. Rejchrt & Higgs, 2015; Zengin & Guneri, 2016), and the quality of corporate governance (e.g. Chan & Cheung, 2012) (see Table 1). However, only a few studies, mainly utilising some of Hofstede's six cultural dimensions (1980, 2001), empirically analyse the impact of culture on ownership. Overall, the existing empirical evidence supports the impact of culture on firm ownership structures for worldwide samples and time periods in the 1990s and 2000s, but there is a lack of theoretical reasoning to deduce the impact of specific dimensions of culture (see Table 1).

To address the aforementioned lack of theoretical reasoning, we focused on Hofstede's (1980, 2001) six dimensions as the most common proxies of culture at the country level used in the literature (cf. Karolyi, 2016; Kirkman, Lowe, & Gibson, 2006) to theorise their impact on ownership concentration.

First, the power distance dimension expresses the degree to which less powerful members of a society accept and expect that power is distributed unequally (larger power distance signalling greater inequality, less egalitarianism, and more room for manoeuvre; Hofstede, 1980). In societies with high power distance, people are perceived as potential threats to power and can rarely be trusted. Economic actors (e. g. owners, managers, and employees) perceive each other as being widely different; dialogue, mutual activities, and mutual trust between them are complicated and cooperation is difficult (De Jong & Semenov, 2006). In societies ranking high in power distance, ownership concentration may be a method of overcoming difficulties in cooperation and trust between individuals by concentrating relationships within the firm boundaries and under one specific power. Furthermore, the rights of minority shareholders may be less protected in high power distance societies and, consequently, to overcome institutional voids, large block holdings are more common. For instance, family ownership concentration is common in high power distance societies because, by holding large shareholdings in firms, families may exploit their dominant position in society (Dow & McGuire, 2016) and unify goals among economic actors through the firm.

Second, the individualism/collectivism dimension defines individualism as a preference for a loosely knit social framework in which individuals are expected to only care for themselves; on the other hand, collectivism represents a preference for a tightly knit societal framework in which individuals can expect their relatives or members of a particular group to support them in exchange for unquestioning loyalty (Hofstede, 1980). In collectivist societies, individuals tend to act in accordance with the interests of the wider group (Fidrmuc & Jacob, 2010). The importance of group interests explains that collectivist societies increase family ownership (Chakrabarty, 2009) and state ownership (Boubakri, Guedhami, Kwok, & Saffar, 2016). Considering this reasoning and prior empirical evidence, we argue that in collectivist societies owners will maintain large shareholdings to control the firm and satisfy the needs of their close groups.

Third, the masculinity/femininity dimension defines masculinity as the preference in society for achievement, heroism, assertiveness, and material rewards for success, with society at large being more competitive (Hofstede, 1980). The values emphasised by masculine societies are expected to thrive in an open economy; further, masculine societies are market-oriented, emphasising competition. Accordingly, stock markets are more developed in countries with high masculinity levels (De Jong & Semenov, 2006). The counterpart, femininity, indicates a preference for cooperation, modesty, caring for the weak, and concern about quality of life. Feminine attitudes are likely to be reflected in government policies that favour income redistribution and high levels of social spending (Johnson & Lenartowicz, 1998). Thus, we would expect feminine societies to be less market oriented and have less developed and efficient capital markets. Ownership structures are closely linked to the structure and functioning of capital markets; Jensen and Meckling (1976) and Fama (1980) predict that more efficient capital markets discourage moral hazards among managers and majority shareholders; this implies that the less market-oriented the economy and the less efficient the capital market, the greater the ownership concentration. As a result, feminine societies are expected to show higher ownership concentration patterns.

Fourth, the uncertainty avoidance dimension captures the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity (countries exhibiting strong uncertainty avoidance maintain rigid codes of belief and behaviour and are intolerant of unorthodox actions and ideas, while weak uncertainty avoidance societies maintain a more relaxed attitude in which practice counts more than principles; Hofstede, 1980). The uncertainty avoidance dimension is intricately linked with individual attitudes towards risk and uncertainty. People in societies with high uncertainty avoidance feel uncomfortable because the future is unknown; they 'look for structure in their organisations, institutions and relationships, which makes events clearly interpretable and predictable' (Hofstede, 2001, p. 148); they tend to minimise all

Table 1
A review of the effect of culture on corporate governance.

Variables	Authors	Questions	Samples	Results
Hofstede's collectivism measure of culture	Boubakri et al. (2016)	Collectivism measure of national culture and residual state ownership	48 countries, 605 privatised firms, 1989–2012	The continued role of government in privatised firms is positively related to collectivism
Hofstede's cultural dimensions (power distance, individualism, masculinity and uncertainty avoidance). Corporate governance quality (discipline, transparency, independence, accountability, fairness and social awareness)	Chan and Cheung (2012)	Relationship between Hofstede's cultural dimensions and corporate governance quality	271 firms in 12 Asian countries in 2001	An influence of culture on ethical sensitivity, which eventually determines the corporate governance practices in different regions
Hofstede's cultural dimensions: collectivism (cohesion within ingroups/families) and power distance (inequalities in society)	Chakrabarty (2009)	The effect of institutional voids and national culture on family ownership	27 countries of La Porta et al. (1999)	National culture and institutional voids influence family ownership patterns around the world. Institutional voids moderate the influence of national culture. National culture has a stronger influence when a country has institutional voids; however, the influence of national culture weakens when institutional voids are overcome
National Culture (GLOBE study) Institutional Environment: voice and accountability; political stability; regulatory quality; control of corruption; rule of law; governance effectiveness (World bank indicators) Corporate governance practices: board accountability; takeover defences and ownership	Daniel et al. (2012)	The influence of cultural practices on corporate governance practices through the mediator role of institutional environment	42 nations, 2006 World Governance Index and 2006 GMI database	The institutional environment mediates the relationship between national culture and corporate governance practices
Culture: Hofstede dimensions (1980, 2001) –collectivism vs.individualism, power distance, uncertainty avoidance, femininity vs. masculinity	De Jong and Semenov (2006)	Characteristics of corporate ownership to the features of the society's culture	27 economically developed countries based on data gathered from La Porta et al. (1999), Pedersen & Thomsen, 1997 and Faccio and Lang 2001	Differences in ownership patterns are related to differences in values – differences in attitudes towards uncertainty have the most significant impact on ownership structure
Varieties of capitalism (liberal market vs coordinated market economies); National Business systems; National legal systems (English or French, German or Scandinavian origin) Governance systems (Germanic & Latin, Japanese or Anglo-Saxon); national cultural systems (GLOBE)	Grosvold and Brammer (2011)	How are the national institutional systems related to the proportion of women on corporate boards of directors?	38 countries from all major continents (Europe, Australasia, Africa, Asia, Latin America, USA & Canada), 2001–2007	Culturally and legally oriented systems appear to play the most significant role in shaping board gender diversity
Culture: egalitarianism (Schwartz index), religion, individualism (Hofstede index), trust	Holderness (2017)	Ownership concentration = f (firm variables, country level variables –culture)	8000 public firms, 32 western European countries. Data gathered from studies from Faccio & Lang (2001), Claessens, Djankov, and Lang (2000), Holderness (2009) and Lins (2003)	More egalitarianism increases the ownership of the public corporations
National culture (all Hofstede's dimensions). Corporate governance characteristics: board independence, gender composition, board leadership, meeting frequency	Humphries and Whelan (2017)	Relationship of national culture and corporate governance codes (regulatory level)	Corporate governance codes from 55 countries (Africa, Asia, Europe, Middle East, North America, Oceania, South/central America)	Significant relationships between Hofstede's cultural dimensions and the four characteristics of corporate governance (board independence/ gender composition/board leadership/meeting frequency)
Culture (Hofstede, 2001): long term orientation/masculinity/power distance/Uncertainty avoidance Index	Lievenbrück and Schmid (2014)	Differences between countries in explaining firm's hedging decisions	Energy utility firms, 2000–2009	Culture has a strong impact on hedging-decisions
National culture based on Hofstede	Rejchrt and Higgs (2015)	Compliance and national culture	68 largest non-domestic companies listed in the UK	Some evidence linking cultural distance to lower levels of compliance of non-domestic companies with the UK standards of corporate governance UK code
National culture based on the GLOBE study	Zengin and Guneri (2016)	Impact of national culture on the effectiveness of legal settings, moderating role of culture	54 countries, 2007–2012	The impact of the perceived strength of auditing and reporting standards on the perceived ethical behaviours of firms is accentuated when a society is characterised by low power distance and in-group collectivism, and high institutional collectivism, future orientation and uncertainty avoidance

kinds of uncertainty by enacting strict laws and rules and by enforcing security measures because they feel anxious in uncertain situations. Holding large stakes in a firm allows owners to control the firm and reduce uncertainty. Thus, we expect higher ownership concentration in countries displaying higher levels of uncertainty avoidance.

Fifth, the short/long term orientation dimension defines long-term orientation (also named pragmatic orientation) as a society's preference for thrift and modern education, open to change and adaptability (Hofstede & Bond, 1988). Societies with higher levels of long-term orientation are more open to social change and are willing to make sacrifices for future benefits, particularly relative to traditional values. Short-term orientation (also named normative orientation) is related to the desire to maintain time-honoured traditions, the fulfilment of social obligations, a commitment to current values, and lesser willingness to change. Large shareholders cannot exit a firm without a substantial decrease in the firm's share price and economic losses and therefore they are more committed to the firm (Franks & Mayer, 1994). Moreover, concentrated ownership patterns are more conducive to implicit contracts than dispersed ownership (De Jong & Semenov, 2006). Thus, we argue that ownership concentration will be higher in short-term orientation societies as it helps in maintaining and preserving the status quo.

Finally, indulgence refers to a society that allows relatively free gratification of basic and natural human drives related to recreation and enjoying life while restraint depicts a society that suppresses and regulates gratification of needs through strict social norms (Hofstede, Hofstede, & Minkov, 2010). Thus, restrained societies are characterised by strictly prescribed roles (at work and home), stricter sexual norms, and great concerns for maintaining order. We argue that the degree of indulgence versus restraint will impact ownership concentration. Higher levels of restraint will drive a higher desire to maintain order and control over a company's strategy and therefore higher ownership concentration.

In sum, taking into consideration the arguments for each of the Hofstede dimensions of culture, we propose the following hypothesis:

H2. . The greater the power distance, collectivism, femininity, uncertainty avoidance, short-term orientation, and restraint of a country, the higher the firm ownership concentration.

2.3. Formal vs informal institutional context

The reasoning behind hypotheses 1 and 2 sustains that both the formal and informal institutional contexts affect ownership patterns across contexts. However, their impact is not isolated from each other and both formal and informal institutions may be considered simultaneously (Estrin & Prevezer, 2011; Helmke & Levitsky, 2004). The literature in emerging economies has addressed this issue, arguing that the 'informal institutional context is important once formal institutions are absent or weak' (Peng, Sun, Pinkham, & Chen, 2009, p. 68). In emerging, developing, and transitional economies, the informal institutional context substitutes for the formal institutional context, but this reasoning does not apply to developed countries, where an average 'good' level of formal context is achieved (e.g. mature institutions). Nevertheless, empirical evidence indicates that ownership concentration is also a common characteristic among developed countries, as it is for European countries (Faccio & Lang, 2002). Why is this the case?

The previous literature points to the importance of informal over formal institutions. For instance, while Stulz and Williamson (2003) show that a country's principal religion (a type of informal institution) determines formal institutions for investor protection, Helmke and Levitsky (2004) and Williamson (2000) show that informal institutions influence the diffusion and effectiveness of corporate governance practices and underpin how formal institutions work. Accordingly, we consider that the opportunistic behaviour of actors with conflicting interests depends on the underlying cultural condition – that is, on informal institutions (Sauerwald & Peng, 2013), and posit that even in

developed countries with highly-developed formal institutional contexts, the informal (cultural) context becomes more important than the formal context as a determinant of firm ownership concentration.

Additionally, following Helmke and Levitsky (2004), we consider that imposing formal institutions that work in one particular cultural context to another cultural setting may not necessarily work. When a formal context is imposed, the informal institutional context (e.g. culture) may increase its importance over the formal context. The existence of informal institutions explains that 'the same formal rules and/or constitutions imposed on different societies produce different outcomes' (North, 1990, p. 36). The EU project has forced European countries to converge their formal institutional environments by imposing one-size-fits-all directives into different cultural settings, which increases the importance of culture as a determinant of ownership concentration. This leads us to deduce that the informal institutional context acquires a central position in determining ownership concentration. Considering these arguments, we propose the following hypothesis:

H3. . The informal institutional context (culture) prevails over the formal institutional context as a determinant of firm ownership concentration in European developed economies.

3. Sample, variables, and methodology

3.1. Sample

The initial database comprises a panel formed by STOXX Europe 600 Index companies from 2009 to 2015. With a fixed number of 600 components, the STOXX Europe 600 Index represents companies across 19 European countries, most of which were members of the EU over the study period. The panel we constructed is imbalanced because we were unable to obtain information for the entire timeframe for all companies as some entered and others exited the stock market during the study period. Thus, the initial database comprises an unbalanced panel, which includes 604[1] companies and 4024 firm-year observations. This initial database was reduced to a sample of 3954 firm-year observations due to missing values for variables relating to ownership (see Table 2, Panel A) and to a sample of 2203 firm-year observations when we further consider control and financial variables (use of the Generalised Method of Moments (GMM) model requires four consecutive and completed years without any missing values to estimate the m_2 statistics). Non-financial companies account for 80.90 percent of the observations, while financial firms account for 19.10 percent (see Table 2, Panel B). Financial companies belong to the following sectors: banks, insurance, life assurance, private equity, and speciality and other finance.

Table 2 illustrates the composition of the sample by year and country. The sample comprises firms from 19 European countries. In comparison with Faccio and Lang (2002) and Holderness (2017) who considered countries in Western Europe, our sample includes six additional countries (one being an Eastern European country) and more recent panel data over seven years (starting in 2009 versus data from the second half of the 1990s). Firms in our sample represent a large percentage of the GDP of 19 countries (Table 2, Panel A). Firm observations are evenly distributed across the study period (Table 2, Panel B).

The companies' ownership structure, financial information, market capitalisation, and industry were obtained from Thomson Reuters. Information on the regulatory and cultural variables was obtained, respectively, from the Worldwide Governance Indicators provided by the World Bank and the Hofstede Insights webpage (https://www.hofstede-insights.com/country-comparison). Thomson and Orbis databases as well as firm webpages were verified to estimate firm age. Information

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[1] The 600STOXX contains 600 firms; however, since firms were entering and exiting during the period of observation, our final database has 604 firms.

Table 2
Sample composition by country and year.

Panel A						
Country	Total sample		Non-financial firms		Financial firms	
	Observations	% Observations	Observations	% Observations	Observations	% Observations
Austria	49	1.24	35	0.88	14	0.35
Belgium	86	2.18	65	1.64	21	0.53
Czech Republic	14	0.35	7	0.18	7	0.18
Denmark	133	3.36	98	2.48	35	0.88
Finland	103	2.60	96	2.43	7	0.18
France	555	14.04	498	12.60	57	1.44
Germany	415	10.50	374	9.46	41	0.10
Greece	27	0.68	13	0.33	14	0.35
Italy	192	4.86	99	2.50	93	2.35
Luxembourg	36	0.91	36	0.91	0	0.00
Malta	5	0.13	5	0.13	0	0.00
Netherlands	181	4.58	168	4.25	13	0.33
Norway	69	1.75	56	1.42	13	0.33
Portugal	26	0.66	21	0.53	5	0.13
Republic of Ireland	91	2.30	77	1.95	14	0.35
Spain	187	4.73	126	3.19	61	1.54
Sweden	271	6.85	201	5.08	70	1.77
Switzerland	348	8.80	267	6.75	81	2.05
UK	1166	29.49	957	24.20	209	5.28
Total	**3954**	**100.00**	**3199**	**80.90**	**755**	**19.10**
Panel B						
	Total sample		Non-financial firms		Financial firms	
Year	Observations	% Observations	Observations	% Observations	Observations	% Observations
2009	528	13.35	429	10.85	99	2.50
2010	554	14.01	446	11.28	108	2.73
2011	563	14.24	453	11.46	110	2.78
2012	566	14.31	457	11.56	109	2.76
2013	579	14.64	469	11.86	110	2.78
2014	587	14.85	476	12.04	111	2.81
2015	577	14.59	469	11.86	108	2.73
Total	**3954**	**100.00**	**3199**	**80.90**	**755**	**19.10**

about GDP per capita was obtained from Eurostat.

3.2. Variables

The variables used are summarised in Table 3. First, we consider continuous variables that refer to the *ownership structure* of the sample firms: the ownership held by the three largest shareholders (OC3), the five largest shareholders (OC5), and the Herfindahl ownership index (HERFINDAHL). Second, there are four variables related to the formal institutional context of each country. LEGALORIG refers to the legal system origin. REGQUAL denotes a country's regulatory quality, which captures perceptions of the government's ability to formulate and implement sound policies and regulations that permit and promote private sector development. RULELAW pertains to the rule of law, that is, the likelihood of crime and violence and the extent to which agents have confidence in and abide by the rules of society, including the quality of contract enforcement, property rights, police, and courts. Finally, CORRUPTION refers to the control of corruption, expressing the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, and 'capture' of the state by elites and private interests.[2] Higher values for REGQUAL, RULELAW, and CORRUPTION denote better quality of regulation, higher scores in rule of law, and less corruption, respectively, indicating better governance.

PCA was used to build an index related to the formal institutional context. A priori results indicated that we should maintain only one principal component with the four variables (Eigenvalue 2.888 for the first component and 0.996 for the second); however, as the second component mainly explains the type of legislation (LEGALORIG) (eigenvector 0.937), we decided to summarise all the variables in one principal component (REGQUAL, RULELAW, and CORRUPTION), except for the type of legislation. Thus, the formal institutional context was measured by considering two factors (which are used in our econometric models), LEGALORIG and FORMAL_INST_INDEX, which account for the quality of governance (eigenvalue = 2.807) and capture 93.58 percent of the variability of these three variables.[3]

The variables relating to the informal institutional context – the cultural environment – of each country are based on Hofstede's dimensions. Our decision stems from the fact that the Hofstede dimensions have been universally used in the economic literature (see Karolyi, 2016 and Kirkman et al., 2006 for a comprehensive review of studies). Although a frequent criticism is that the data are based on old observations, Beugelsdijk, Maseland, and van Hoorn (2015) demonstrate that cultural differences between country pairs are generally stable. Hofstede (1980, 2001) developed six dimensions of culture at the country level, which represent independent preferences for one state of affairs over another, distinguishing countries (rather than individuals) from each other. In line with hypothesis 2, we consider the degree of power distance (HOFPDI), collectivism (HOFCOL), femininity (HOFFEM), uncertainty avoidance (HOFUAI), short-term orientation (HOFSHTO), and restraint (HOFRES).

As the original Hofstede dimensions are defined in terms of

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[2] From the six governance indicators provided by the World Bank, we selected the dimensions of regulatory quality, rule of law, and control of corruption for our study because they may affect the way firms do business by altering the quality of economic activities and risk perception related to contract enforcement, property rights, and principal-principal problems.

[3] Because the second component's eigenvalue equals 0.148 and adds just 4.95 percent of variability (joint variability 98.53 percent), we selected the first component. Eigenvectors between FORMAL_INST_INDEX and governance indicators are regulatory quality (0.567), rule of law (0.587), and control of corruption (0.578).

Table 3
Variables description.

Variable	Description
OC3	Ownership held by the first three significant shareholders (significant shareholdings are defined as those above three percent threshold)
OC5	Ownership held by the first five significant shareholders (significant shareholdings are defined as those above three percent threshold)
HERFINDAHL	Sum of square shareholdings of the ten first significant shareholders
LEGALORIG	Dummy variable that takes a value of one if a country's legal origin is common law and zero civil law
REGQUAL	Regulatory quality, Worldwide Governance Indicators, World Bank (2009–2015)
RULELAW	Rule of law, Worldwide Governance Indicators, World Bank (2009–2015)
CORRUPTION	Control of corruption, Worldwide Governance Indicators, World Bank (2009–2015)
FORMAL_INST_INDEX	Principal Component Analysis using regulatory quality, rule of law and control of corruption variables
HOFPDI	Value of Hofstede's power distance index
HOFCOL	Value of Hofstede's collectivism vs. individualism dimension. As the original Hofstede dimension is individualism, the collectivism dimension is calculated as 100 minus individualism scores
HOFFEM	Value of Hofstede's femininity vs. masculinity dimension. As original Hofstede dimension is masculinity, the femininity dimension is calculated as 100 minus masculinity scores
HOFUAI	Value of Hofstede's uncertainty avoidance index
HOFSHTO	Value of Hofstede's short-term normative orientation vs. long-term orientation. As original Hofstede dimension is long-term orientation, the short-term orientation is calculated as 100 minus long- term orientation scores
HOFRES	Value of Hofstede's restraint vs. indulgence dimension. As original Hofstede dimension is indulgence dimension, the restrain dimension is calculated as 100 minus indulgence scores
INFORMAL_INST_INDEX	Principal Component Analysis using Hofstede's power distance index, collectivism dimension, uncertainty avoidance index, and restraint dimension
SIZE	Total assets (introduced in the empirical analysis as a logarithm)
LEV	Quotient between borrowed funds (short-term and long-term debt) and total assets
MTBV	Quotient between firm market capitalisation and equity book value
AGE	$Year_{it}$ - INC_i, where $Year_{it}$ is the corresponding period and INC_i is the date of incorporation of the firm (introduced in the empirical analysis as a logarithm)
SECTOR	Dummy variable that takes a value of one if a firm's sector is regulated (Aerospace & Defence, Electricity, Insurance, Life Assurance, Mining, Oil & Gas, Pharmaceuticals & Biotechnology, Renewable Energy, Speciality & Other Finance, Steel & Other Metals, Telecommunication Services, Transport, Utilities – Other) and zero otherwise
GDP	A country GDP per capita at market prices (current prices, euro per capita) for each country and each of the corresponding years (2009–2015)

individualism, masculinity, long-term orientation, and indulgence, instead of collectivism, femininity, short-term orientation, and restraint, for these last four dimensions we have defined the corresponding variables employed in the analyses as follows: collectivism is calculated as 100 minus individualism scores; femininity as 100 minus masculinity scores; short-term orientation as 100 minus long-term orientation scores, and restraint as 100 minus indulgence scores. In addition, given the large number of cultural variables, we apply PCA for all informal institutional variables. The results reveal that we should maintain two principal components (Eigenvalues 3.034 and 1.340, respectively); however, the relationship between the first component and short-term orientation (HOFSHTO) is negative, while the second component mainly explains femininity (HOFFEM) (eigenvector 0.769), and the

relationship between the first component and HOFFEM is almost zero (eigenvector: 0.049). Thus, for our estimations, we built one factor INFORMAL_INST_INDEX with four Hofstede variables (HOFPDI, HOFCOL, HOFUAI, HOFRES) (eigenvalue = 2.838) that captures 70.96 percent of variability,[4] while the two other Hofstede dimensions are considered independently (HOFFEM, HOFSHTO).

Finally, we selected control variables to assess firm characteristics such as size (SIZE) expressed as a logarithm in the analyses, firm leverage (LEV), a market performance indicator (MTBV), and firm age (AGE) expressed as a logarithm in the analyses. Additionally, the type of sector to which the firm belongs (SECTOR), regulated or not, and country GDP per capita at market prices in each year (GDP) were introduced to control industry-level and country-level variables, respectively.

Table 4 presents descriptive information regarding the formal and cultural institutional variables for each sample country. All countries except the UK and Ireland, which have a common-law legal origin (LEGALORIG), follow civil law. In terms of regulatory quality (REGQUAL), important differences between countries emerge. Fig. 1 shows that Finland, Sweden, Denmark, and the Netherlands have high regulatory quality scores, followed by the UK, Ireland, and mainly Central European countries (Luxembourg, Switzerland, Germany, Austria, Belgium, France). Spain, Portugal, Italy, and Greece have low regulatory quality scores. For the rule of law dimension (RULELAW), Fig. 2 shows that Nordic countries are ranked highest, followed by Central European and Anglo-Saxon countries. Greece and Italy are ranked lowest. Control of corruption (CORRUPTION) is displayed in Fig. 3; Denmark, Norway, Finland, Switzerland, Sweden, and the Netherlands are ranked highest, followed by a group of countries comprising Germany, Belgium, Ireland, Austria, France, and Portugal; Spain, Malta, the Czech Republic, Italy, and Greece are ranked lowest. A first interpretation from Table 4 and the visual perception of formal institutional contexts from Figs. 1–3 hinges on the differences across European countries. Countries vary not only in their legal system origins but also in other formal institutional variables such as regulatory quality, rule of law, and control of corruption.

European countries also reveal differences in their informal (cultural) institutional context. France, Belgium, and Portugal present the highest HOFPDI scores; Portugal, Greece, and Spain are the most collectivist countries (HOFCOL), while Sweden, Norway, and the Netherlands score highest for femininity (HOFFEM). The highest score of HOFUAI is exhibited by Mediterranean countries like Greece, Portugal, and Malta. Ireland and Portugal are ranked highest in the Hofstede short-term normative orientation (HOFSHTO) followed by Norway, Finland, and Denmark. Finally, the Czech Republic, Italy, and Portugal score highest in the HOFRES dimension. Thus, Mediterranean countries appear to score higher in collectivism, higher uncertainty avoidance, and restrain dimensions, while Nordic countries seem to be more feminine and exhibit a short-term orientation. Central European countries, in general, indicate low scores in the power distance dimension, are more individualistic and masculine, and score highly in the dimensions of uncertainty avoidance and long-term orientation. Regarding the restrain vs. indulgence dimension, Austria and Switzerland score high in the former and Germany scores high in the latter.

3.3. Methodology

We used panel data methodology to estimate regression models where the dependent variables are the different definitions of ownership concentration: OC3, OC5, and the Herfindahl index. Specifically, the general panel data dynamic model to be tested is as follows:

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[4] Eigenvectors between INFORMAL_INST_INDEX and cultural dimensions are power distance (0.476), collectivism (0.418), uncertainty avoidance (0.579), and restraint (0.513).

Table 4
Countries' institutional setting - in relation to legal origin, regulatory quality, rule of law and control of corruption and culture (Hofstede's dimensions).

Country	Obsv.	Common Law versus Civil Law	Type of Civil Law	Regulatory Quality [a]	Rule of Law [a]	Control of Corruption [a]	HOFPDI	HOFCOL	HOFFEM	HOFUAI	HOFSHTO	HOFRES
Austria	49	Civil Law	German	1.46 (1.40)	1.84 (1.86)	1.52 (1.52)	11	45	21	70	40	37
Belgium	86	Civil Law	French	1.26 (1.29)	1.44 (1.46)	1.57 (1.57)	65	25	46	94	18	43
Czech Republic	14	Civil Law	German	1.15 (1.10)	1.05 (1.15)	0.34 (0.43)	57	42	43	74	30	71
Denmark	133	Civil Law	Scandinavian	1.81 (1.73)	1.95 (2.04)	2.35 (2.21)	18	26	84	23	65	30
Finland	103	Civil Law	Scandinavian	1.84 (1.84)	1.99 (2.06)	2.21 (2.28)	18	26	84	23	65	30
France	555	Civil Law	French	1.17 (1.13)	1.45 (1.41)	1.40 (1.31)	68	29	57	86	37	52
Germany	415	Civil Law	German	1.60 (1.72)	1.70 (1.80)	1.80 (1.84)	35	33	34	65	17	60
Greece	27	Civil Law	French	0.56 (0.41)	0.49 (0.27)	−0.07 (0.08)	60	65	43	100	55	40
Italy	192	Civil Law	French	0.78 (0.73)	0.39 (0.28)	0.09 (0.02)	50	24	30	75	39	70
Luxembourg	36	Civil Law	French	1.71 (1.66)	1.85 (1.87)	2.09 (2.10)	40	40	50	70	36	44
Malta	5	Civil Law	French	1.24 (1.17)	1.26 (1.14)	0.89 (0.90)	56	41	53	96	53	34
Netherlands	181	Civil Law	French	1.76 (1.80)	1.87 (1.94)	2.06 (1.88)	38	20	86	53	33	32
Norway	69	Civil Law	Scandinavian	1.58 (1.61)	1.95 (2.01)	2.18 (2.24)	31	31	92	50	65	45
Portugal	26	Civil Law	French	0.80 (0.96)	1.08 (1.15)	1.02 (0.96)	63	73	69	99	72	67
Republic of Ireland	91	Common Law	–	1.66 (1.82)	1.76 (1.77)	1.60 (1.62)	28	30	32	35	76	35
Spain	187	Civil Law	French	0.97 (0.81)	1.06 (0.90)	0.92 (0.58)	57	49	58	86	52	56
Sweden	271	Civil Law	Scandinavian	1.81 (1.82)	1.97 (2.04)	2.25 (2.24)	31	29	95	29	47	22
Switzerland	348	Civil Law	German	1.66 (1.74)	1.83 (1.95)	2.11 (2.14)	34	32	30	58	26	34
UK	1166	Common Law	–	1.72 (1.85)	1.75 (1.81)	1.69 (1.88)	35	11	34	35	49	31

[a] Denotes the mean value over the period of analysis (value of the last year).

$$OC_{it} = \alpha_0 + \beta X_{it} + \gamma_i + \mu_{it}$$

where i indexes the firm, t indexes time, X denotes the explanatory and control variables, and γ_i is the firm's effect, which we assume is constant for firm i during period t, and μ_{it} is the error term.

We used the two-step difference GMM model for dynamic panel data models created by Arellano and Bond (1991). Unlike cross-sectional analysis, the dynamic panel data analysis is a more robust methodology that allows us to control for individual heterogeneity or unobservable individual effects (company effects) by considering first-differences; it also controls for endogeneity. The GMM estimator uses internal instruments that are based on lagged values of the explanatory variables that may present problems of endogeneity. In our models, we considered some of the control variables (firm size, firm leverage, and firm performance) as endogenous and the formal and informal (cultural) institutional variables, firm age, firm sector, and country GDP as exogenous. All the endogenous right-hand-side variables of the model are lagged from t-1 to t-4 for equations in differences.[5] Including some variables in our models that present problems related to endogeneity, which justifies employing a dynamic panel data methodology instead of static panel data models such as fixed effects or random effects models. To check the validity of the model specification when using GMM, we used Hansen's statistic of over-identifying restrictions. Hansen's statistic tests for the absence of correlation between the instruments and error term. We also included m_2 statistics to verify the lack of second-order serial correlation in the first-difference residuals. In addition to these specification contrasts, the following Wald tests were included in the estimations: z_1 of the joint significance of the reported coefficients and z_2 of the joint significance of annual dummy variables. We corrected the estimations for heteroscedasticity problems using the option robust for the xtabond2 command of the Stata software.

4. Results

Table 5 presents descriptive information of the study variables. As per the ownership data (Panel A), the three largest shareholders (OC3) hold 28.4 percent on average, while the five largest owners (OC5) hold 31.7 percent. The Herfindahl ownership concentration index has a mean of 0.076. Concerning the formal institutional variables (Panel B), the percentage of observations that have a common-law and civil-law legal origin (LEGALORIG) is 30.32 percent and 69.68 percent, respectively; on average, regulatory quality amounts to 1.556, rule of law to 1.663, and control of corruption to 1.714. Regarding the cultural dimensions (Table 5, Panel C), on average, the power distance index (HOFPDI) has a value of 40.285, collectivism (HOFCOL) 25.567, femininity (HOFFEM) 50.605, uncertainty avoidance index (HOFUAI) 54.256, short-term orientation (HOFSHTO) 41.880, and restraint (HOFRES) 40.446. For a sample of 55 countries worldwide, Humphries and Whelan (2017) report higher figures for power distance (59.6 percent) and uncertainty avoidance index (63.87 percent) and lower figures for individualism (46.62 percent) and masculinity (46.3 percent). Daniel, Cieslewicz, and Pourjalali (2012) report that on average, contemporary societies score higher on individualism and indulgence and lower on power distance than past societies. Thus, European countries, compared to the world, indicate lower acceptance of inequality, are more 'relaxed' and tolerant, are more individualistic, and exhibit more masculinity.

Table 6 lists the correlation coefficients of the variables used. Once the non-normality of the explanatory and control continuous variables was confirmed, and the Pearson's correlation coefficient was found to not function adequately for discrete variables, as it was very sensitive to violations of normality assumptions, Spearman's rank correlations were calculated. Although some of the variables were significantly correlated, the analysis of the variance inflation factors (VIF) revealed no evidence of multicollinearity, as all of them remained under 10 (Kleinbaum, Kupper, & Muller, 1998) and even under 5 (Hair, Black, Babin, & Anderson, 2010).

As GMM requires information to be available for at least four consecutive years per company to test the absence of second-order serial correlation and due to some missing values for the variables in particular cases, we worked with an unbalanced panel of 2203 observations. Table 7 reports the GMM results for different ownership concentration (dependent) variables (OC3, OC5, and the Herfindahl index) in relation
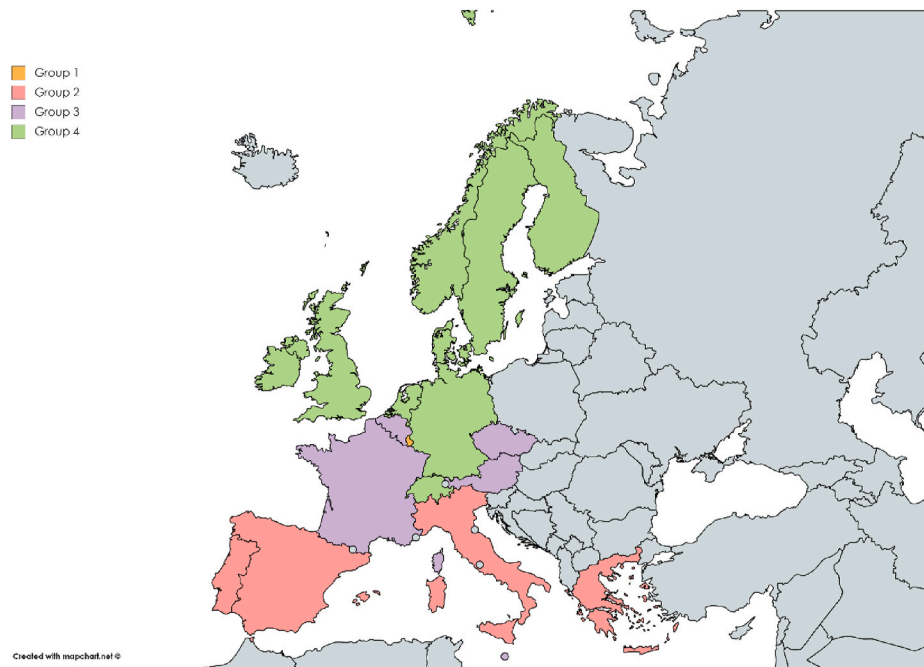
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[5] Our model demonstrates a situation of simultaneity or causality between ownership concentration and the control variables that refer to firm characteristics. Instrumental variables (IV) may be another option to solve reverse causality, although identifying suitable instruments is difficult. As Pindado and Requejo (2015) document, the main limitation of IV is to choose those outside instruments that are uncorrelated with the error term and contain sufficient information on the explanatory variables in the model that are not strictly exogenous. Furthermore, the conventional IV estimator (though consistent) is inefficient in the presence of heteroscedasticity (Baum, Schaffer, & Stillman, 2003).

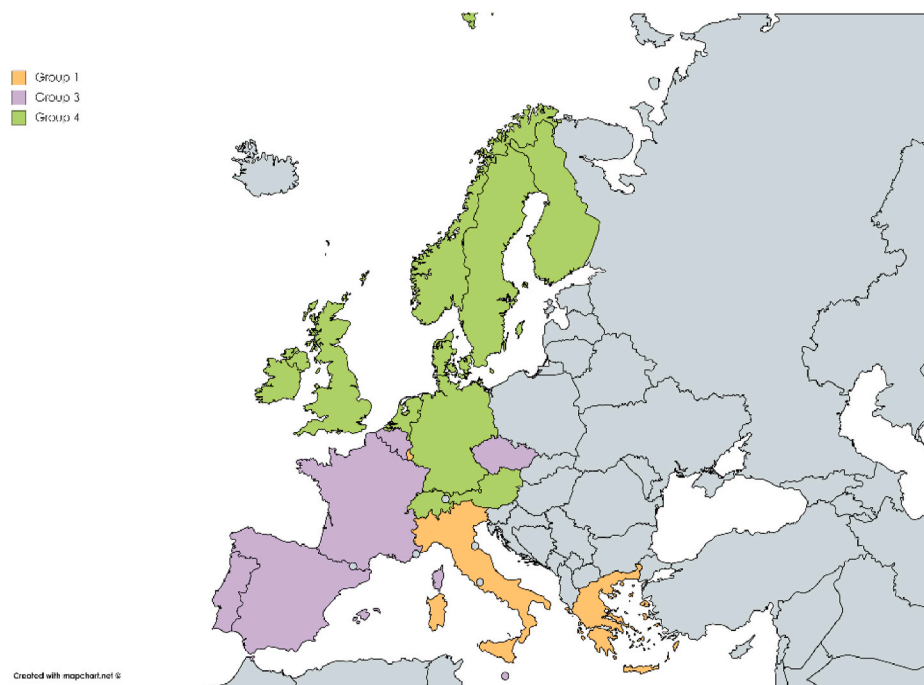**Fig. 1.** Regulatory quality of European countries of the sample.

Fig. 2. Rule of law of European countries of the sample.

to the formal institutional context variables – LEGALORIG and FORMAL_INST_INDEX (Models 1, 4, and 7), and informal institutional context variables – HOFFEM, HOFSHTO, and INFORMAL_INST_INDEX (Models 2, 5 and 8). Table 7 also presents the joint models considering both formal and informal context variables (Models 3, 6, and 9). For the formal institutional context variables (Table 7, Models 1, 4, and 7), legal origin (LEGALORIG) appears to negatively influence firm ownership concentration independent of its measure. Therefore, common-law countries present lower levels of firm ownership concentration. Additionally, FORMAL_INST_INDEX in all models (Models 1, 4, and 7) presents a negative and significant coefficient at the five percent level; that is, the higher the quality of regulation, rule of law, and control of corruption, the lower the level of ownership concentration. This provides us with evidence to accept hypothesis 1.

In contrast, regarding informal institutional context variables (culture), we find that the higher the INFORMAL_INST_INDEX and HOFSHTO variables, the higher the firm ownership concentration (Models 2, 5, and 8). This suggests that, as predicted, the higher the level of power distance, collectivism, uncertainty avoidance, restraint, as well as short-term orientation, the greater the level of firm ownership concentration. However, in terms of the femininity vs. masculinity dimension, we found no significant effect of this cultural dimension on firm ownership concentration. Consequently, we can accept hypothesis 2 (except for the femininity dimension).
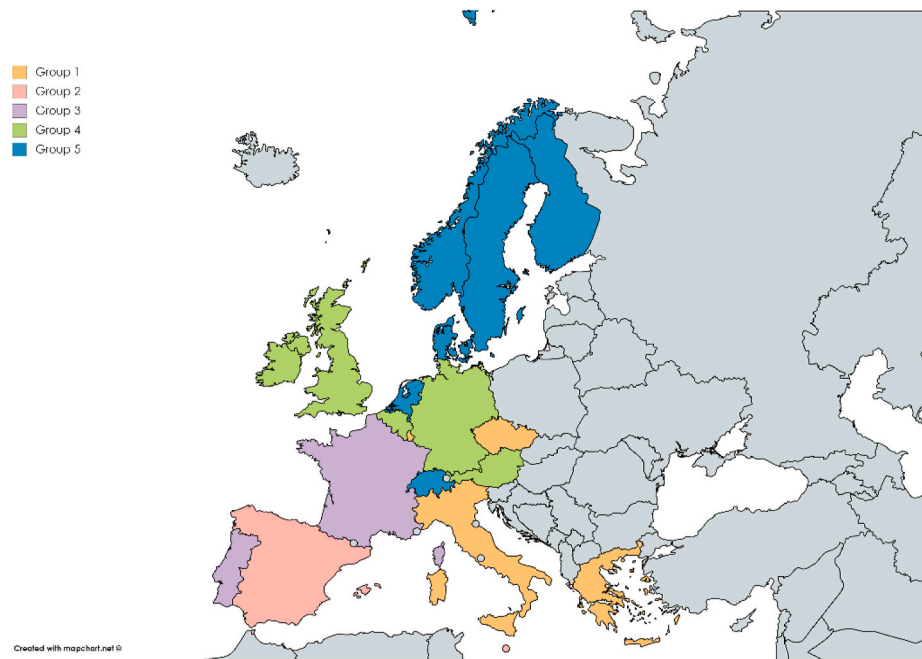
Fig. 3. Control of corruption of European countries of the sample.

Table 5
Descriptive statistics.

Variable	Mean	Median	Std. Dev.	Minimum	Maximum
Panel A: Ownership concentration					
OC3	0.284	0.223	0.183	0	0.921
OC5	0.317	0.281	0.184	0	0.921
HERFINDAHL	0.076	0.024	0.118	0	0.847
Panel B: Legal and governance institutional variables					
REGQUAL	1.556	1.655	0.323	0.626	1.908
RULELAW	1.663	1.757	0.353	0.275	2.100
CORRUPTION	1.714	1.738	0.499	−0.030	2.405
Panel C: Cultural dimension variables					
HOFPDI	40.285	35	13.950	11	68
HOFCOL	25.567	29	11.348	11	73
HOFFEM	50.605	34	23.148	21	95
HOFUAI	54.256	53	21.796	23	99
HOFSHTO	41.880	47	14.110	17	76
HOFRES	40.446	34	13.488	22	71
Panel D: Institutional variables descriptive frequencies					

Variable	Number of observations			Percentage of total sample	
LEGALORIG = 1	668			30.32	
LEGALORIG = 0	1535			69.68	

n = 2203.

The results provide additional evidence to support that formal and informal institutional contexts affect firm ownership concentration. However, in accordance with our third hypothesis, when implementing the joint model including both formal (LEGALORIG and FORMAL_INST_INDEX) and informal variables (HOFFEM, HOFSHTO, and INFORMAL_INST_INDEX) along with control variables, the results indicate that none of the formal institutional variables show significant coefficients, while INFORMAL_INST_INDEX remains significant and displays a positive influence on firm concentration (significant at the one percent level) (Models 3, 6, and 9).[6] Additionally, the short-term

variable (HOFSHTO) remains significant and displays a positive influence on firm concentration in Models 3 and 6 (Table 7) where firm ownership concentration is measured by OC3 and OC5, respectively. Similarly, femininity (HOFFEM) proves to be positive and significant at 10 percent in Model 9 (Table 7).[7] Consequently, in line with hypothesis 3, our results seem to support that culture prevails over the formal institutional context as a determinant of ownership concentration in European developed economies.

Regarding the control variables, MTBV appears to have a negative influence on firm ownership concentration (Models 1–7, Table 7). It could be argued that shareholders may be willing to increase their holdings in less profitable firms to control management and undertake restructuring. Firm leverage (LEV) also negatively affects firm ownership concentration when it refers to OC3 and OC5 (Models 2–6, Table 7). As Jensen (1986) argues, leverage may mitigate the agency cost of free cash flow, and thus, highly leveraged firms would not need the monitoring of large shareholders, and consequently, ownership concentration should be lower in highly leveraged firms. These findings are in line with Demsetz and Villalonga (2001) and Hu and Izumida (2008), who conclude that firms' leverage significantly influences firms' ownership. Finally, similar to Cho (1998), the SECTOR variable significantly influences firm ownership concentration in all models except Model 1 (Table 7), suggesting that regulated firms show higher levels of ownership held by the largest shareholders. Different types of activities may require different levels of firm monitoring. As pointed out by Demsetz and Lehn (1985), there may be problems of amenity consumption by management in regulated settings as the cost-plus pricing regulation reduces the incentive to hold down costs and dulls competition. If this is the case, regulated firms would be expected to require more monitoring and thus would present higher ownership

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[6] For the joint models, a Wald test for the reported coefficients of the explanatory variables (the formal and informal institutional contexts) without considering control variables was estimated. For all models, the test turns out to be significant: 33.57*** (in Model 3), 29.49*** (in Model 6), and 24.17*** (in Model 9).

[7] Although the correlation between the formal and informal institutional indexes does not exceed the conventional cut-off (0.80) (Studenmund, 2005), and VIFs, the generally accepted criterion to confirm the absence of multicollinearity concerns are below 5 in all models (Hair et al., 2010), to corroborate the reliability of our estimations, we have also estimated the condition number index considering only both institutional indexes and both indexes along with the three dependent variables, alternatively. The condition number values reveal no evidence of multicollinearity between these variables.

Table 6
Correlation matrix.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. OC3	1													
2. OC5	0.969***	1												
3. HERFINDAHL	0.983***	0.962***	1											
4. LEGALORIG	−0.141***	−0.062***	−0.133***	1										
5. FORMAL_INS_INDEX	−0.144***	−0.141***	−0.157***	0.034	1									
6. HOFFEM	0.063***	0.037*	0.048**	−0.358***	0.268***	1								
7. HOFSHTO	0.000	0.029	0.000	0.485***	0.189***	0.261***	1							
8. INFORMAL_INS_INDEX	0.185***	0.149***	0.188***	−0.499***	−0.692***	−0.147***	−0.463***	1						
9. SIZE	−0.092***	−0.143***	−0.103***	−0.148***	−0.243***	0.018	−0.124***	0.276***	1					
10. LEV	0.030	0.032	0.023	−0.049***	−0.080***	0.054***	0.011	0.050**	0.045**	1				
11. MTBV	−0.021	−0.003	−0.022	0.131***	0.190***	−0.031	0.063***	−0.192***	−0.497***	−0.003	1			
12. AGE	−0.054*	−0.080***	−0.054*	−0.127***	0.068***	0.066***	−0.097***	0.007	0.102***	−0.031	−0.018	1		
13. SECTOR	0.069***	0.056***	0.075***	0.061***	−0.096***	−0.019	0.125***	0.024	0.135***	0.047***	−0.087***	−0.108***	1	
14. GDP	−0.099***	−0.122***	−0.110***	−0.212***	0.798***	0.093***	−0.120***	−0.424***	−0.179***	−0.099***	0.159***	0.079***	−0.133***	1

***p < 0.01, **p < 0.05, *p < 0.10.

n = 2205.

concentration ratios.

Finally, we repeated our estimations employing additional measures. We do not present the results when considering the ownership held by the first 10 significant shareholders (OC10) as the dependent variable since considering additional shareholders over the five largest does not significantly increase firm ownership. Nevertheless, when repeating the estimations using OC10 as the dependent variable, the results did not vary. We also repeated the estimations using the ownership held by the largest shareholder (OC1) as the dependent variable; however, no independent variables present significant coefficients and the model was not significant either (test Wald z_1 is not significant). We also created dummy variables that correspond to the industries identified by Thomson Reuters for our database and included them in the analyses as shown in Table 7 (instead of using the regulated/non-regulated industry dummy variable). The results do not vary for the models that use OC3 and OC5 as dependent variables. When using the Herfindahl index as the dependent variable, Model 7 shows similar results, while in Models 8 and 9 the informal index remains statistically significant, while the respective variables that relate to short time orientation and femininity do not turn out to be significant. Thus, overall, the results when including industry dummy variables lead to the same conclusion that culture determines ownership concentration. Finally, we estimated the proposed models considering the control variable related to GDP in terms of logarithm in the analyses, and the results remained the same.

5. Discussion and conclusion

There is established documented empirical evidence that associates firm ownership concentration to the quality of formal institutional context (e.g. Faccio & Lang, 2002; La Porta, Lopez-de-Silanes, & Shleifer, 1998, 1999; Pedersen & Thomsen, 1997); however, research has paid scant attention to the association between the informal institutional context and firm ownership concentration. Therefore, to incorporate the effect of informal institutional context on ownership concentration (Holderness, 2017) following a context-sensitive approach, we aimed to advance the research by simultaneously investigating the impact of both the formal and informal (cultural) institutional contexts on ownership concentration in Europe.

Summarising our findings, we found, in line with our hypothesis 1 and previous research (e.g. La Porta et al., 1998; La Porta, Lopez-de-Silanes, & Shleifer, 2008), that low quality governance (low-quality regulation, low rule of law, and low control of corruption) and civil-law legal origin are associated with higher firm ownership concentration. Additionally, consistent with hypothesis 2, we found that culture also plays a role in explaining ownership concentration. Specifically, our findings indicate that high power distance, collectivism, uncertainty avoidance, restraint, and short-term orientation favour ownership concentration. We interpret that firm ownership concentration may help overcome institutional voids in societies that accept unequal power and wealth distribution among individuals (power distance), help owners protect group interests (collectivism), minimise uncertainty (uncertainty avoidance), preserve current values and avoid change (short-term orientation), and maintain order and control (restraint). Finally, consistent with hypothesis 3, when both formal and cultural institutional contexts are considered simultaneously, the cultural context prevails over the formal institutional context as a determinant of ownership concentration in European listed firms.

Additionally, our results contradict Holderness's (2017) findings regarding the power distance/egalitarian dimension of culture. While Holderness (2017, p. 47) found that egalitarianism – 'the belief that all people are of equal worth' and that individuals accept hierarchies – increases ownership concentration, our empirical evidence reveals that high power distance increases ownership concentration. Whereas Holderness (2017) justified his finding based on the owners' need to protect themselves in contexts where employees have strong legal rights, our contradictory results are justified by the thesis that ownership

Table 7
GMM results: formal environment, cultural environment and ownership concentration.

Independent variables	Dependent variable: OC3			Dependent variable: OC5			Dependent variable: HERFINDAHL		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
LEGALORIG	−0.010*** (−3.29)		5.572e-04 (0.12)	−0.006* (−1.93)		0.004 (0.89)	−0.006*** (−3.12)		0.001 (0.54)
FORMAL_INST_INDEX	−0.032** (−2.40)		−0.003 (−0.21)	−0.030** (−2.27)		−0.001 (−0.07)	−0.017** (−1.99)		−1.5404e-04 (−0.17)
HOFFEM		4.658e-04 (1.18)	5.732e-04 (1.11)		9.49e-05 (0.23)	4.221e-04 (0.79)		2.802e-04 (1.38)	4.77e-04* (1.81)
HOFSHTO		0.002** (2.42)	0.002** (2.02)		0.002*** (2.83)	0.002** (2.10)		0.001** (2.05)	7.735e-04 (1.43)
INFORMAL_INST_INDEX		0.071*** (5.46)	0.070*** (4.57)		0.067*** (5.20)	0.072*** (4.76)		0.039*** (4.65)	0.039*** (4.16)
SIZE	−0.006 (−0.51)	−0.012 (−1.05)	−0.012 (−0.98)	−0.014 (−1.14)	−0.019 (−1.54)	−0.019 (−1.54)	−0.002 (−0.36)	−0.007 (−1.07)	−0.006 (−1.01)
LEV	−0.139 (−1.56)	−0.136* (−1.62)	−0.138* (−1.67)	−0.193* (−1.94)	−0.177* (−1.91)	−0.190** (−2.14)	−0.026 (−0.57)	−0.035 (−0.80)	−0.036 (−0.86)
MTBV	−5.678e-04*** (−2.85)	−4.665e-04** (−2.42)	−4.675e-04** (−2.39)	−5.706e-04** (−2.35)	−4.798e-04** (−2.11)	−4.666e-04** (−2.03)	−3.046e-04** (−2.44)	−2.262e-04 (−1.50)	−2.348e-04 (−1.59)
AGE	−0.005 (−0.62)	−2.237e-04 (−0.03)	−8.281e-04 (−0.10)	−0.008 (−0.90)	−0.004 (−0.45)	−0.004 (−0.50)	0.003 (0.52)	0.006 (1.29)	0.005 (1.06)
SECTOR	0.036 (1.64)	0.039* (1.80)	0.038* (1.76)	0.038* (1.77)	0.041** (1.98)	0.041* (1.93)	0.030* (1.90)	0.033** (2.25)	0.032** (2.22)
GDP	8.59e-08 (0.09)	3.49e-07 (0.41)	4.20e-07 (0.46)	−7.40e-08.0 (−0.08)	3.86e-07 (0.42)	4.09e-07 (0.42)	1.83e-07 (0.37)	2.41e-07 (0.54)	1.03e-07 (0.22)
Annual effect considered	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
z_1	34.61***	46.16***	46.63***	25.99***	40.44***	42.11***	22.17***	33.15***	34.93***
z_2	35.57***	44.32***	37.93***	55.48***	64.77***	61.87***	14.54**	16.39***	17.35***
m_2	0.40	0.07	0.10	0.16	−0.12	−0.01	1.31	0.78	0.84
Hansen	48.78	50.00	49.56	49.64	49.47	48.69	58.32	63.99	61.23

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.
z-value between brackets.
Number of observations = 2203 Number of groups = 392.
z_1 is a Wald test for the reported coefficients of the explanatory and control variables, asymptotically distributed as χ^2 under the null of no relationship for all the explanatory and control variables. z_2 is a Wald test for the reported coefficients of the dummy annual variables, asymptotically distributed as χ^2 under the null of no relationship for all the dummy annual variables. m_2 is the second-order serial correlation relation in the regression residuals, asymptotically distributed as N (0, 1) under the null of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of no correlation between the instruments and the error term.

concentration mirrors the social acceptance of unequal power and wealth distribution among individuals. Ownership concentration may embrace different actors, who are implicit in unequal societies, within the firm boundaries to reduce conflict and increase cooperation. Beside explanations associated with the use of different samples (regional scope and period), future research should explore both explanations. Additional potential explanations for such contradictory results could be related to ownership identity. Cultural dimensions in different formal institutional contexts could fluctuate their impact not only on ownership concentration but also on investors' typology.

Our article extends the existing research stream that mainly emphasised the formal institutional context (e.g. Djankov et al., 2008; La Porta et al., 1999) and broadens the current debate on the importance of culture as a determinant dimension for firm ownership concentration. We achieved this by addressing Boyd and Solarino's (2016) call to simultaneously investigate the relationship between the formal and informal institutional contexts and ownership concentration. Addressing this call is important because while the formal institutional context defines the general incentives and opportunities for economic actors, the way actors react and economic resources are organised are culturally dependent. In other words, culture shapes how individuals interpret the world and organise their firms to exploit economic opportunities.

In line with Holderness (2017) and Lu et al. (2018), our study considers both the formal and informal institutional contexts as determinants of firm ownership concentration. On the one hand, we theoretically extend the existing arguments to link culture and ownership concentration (Estrin & Prevezer, 2011; Sauerwald & Peng, 2013) in the context of developed economies. We specifically focussed on the European context where firms present high ownership concentration

(Faccio & Lang, 2002) and principal-principal problems (Renders & Gaeremynck, 2012). Europe constitutes a perfect natural laboratory because within the EU there is a political intention to harmonise the formal institutional contexts among European countries; however, Europe is a mosaic of different cultures. In other words, while the formal institutional context may converge across European countries, it does not necessarily mean cultural convergence. Generally, we found evidence to support our thesis that in developed countries – a context where institutions already achieve higher quality of government – cultural aspects are important for defining the way economic actors, in this case owners, define their positions within the boundaries of the firm.

In line with the theoretical contributions, our article has introduced important empirical improvements to advance the study of the determinants of firm ownership concentration across countries. While previous studies only considered one or a few cultural variables to proxy the informal institutional context (e.g. Holderness, 2017), we applied PCA to create a cultural index and empirically evaluate the impact of Hofstede's (1980, 2001) six cultural dimensions on ownership concentration. On the other hand, while Holderness (2017) used data from the USA, Western Europe, and East Asia from the 1990s, our data focused on one particular geographical area (Europe) and covered a more recent period. This is relevant because during the last two decades, the world has experienced important social changes due to globalisation and two financial crises (the internet bubble and the global financial crisis), effecting significant changes in stock market capitalisations, the importance of corporate governance, and the new regulations (Davydoff, Fano, & Qin, 2013). Therefore, our study provides a recent depiction of the importance of the formal and informal institutional contexts in determining firm ownership concentration.

Overall, our article contributes to the existing academic efforts to theorise about context (Krueger et al., 2021) when explaining firm performance and behaviour. Specifically, we contribute to the literature that analyses the relationship between Hofstede's different cultural dimensions (1980, 2001) and firm behaviour and corporate governance characteristics (Chan & Cheung, 2012; Grosvold & Brammer, 2011; Humphries & Whelan, 2017; Rejchrt & Higgs, 2015; Zengin & Guneri, 2016). Consequently, by applying a context-sensitive research approach, we not only provide additional evidence and explanations of the contextual circumstances that may constrain or shape firm ownership concentration but also contribute to the institutional theory (North, 1990) to refine the importance of cultural context in economic activities.

Our study also has practical implications, specifically for policy makers. Context-sensitive polices are required to address principal-principal problems originated by ownership concentration. Having discovered that firm ownership concentration in developed countries is more of a cultural consequence than a reaction to formal regulations, policy makers may address the principal-principal problems that high levels of firm ownership concentration better engender. Due to the supranational nature of the EU, Europe has been engaged in a homogenisation process in terms of formal institutional contexts, but it also shows a high degree of fragmentation in relation to its countries' informal institutional contexts with important cross-cultural differences (Waarts & van Everdingen, 2005). If principal-principal problems due to ownership concentration are caused by cultural factors, any solution may be arrived at by addressing the informal institutional context.

This study has several limitations that delineate the boundaries of its contributions and further point towards opportunities for future research. First, our results are confined to a particular group of firms characterised by size since we used a sample of the 600 European listed firms listed in the STOXX Europe 600 Index. Future research should focus on building a more inclusive database in terms of firm size to test how both formal and informal institutional contexts determine ownership concentration. Second, our research focuses solely on exploring the influence of the formal and informal institutional contexts on ownership concentration. Their impact on the different typologies of investors could be an important future research path. Finally, although the institutional theory provides a general theoretical umbrella to posit that context affects the way an organisation is owned, governed, and managed, there remains a need to explain how, when, and in what direction different dimensions of contexts affect ownership concentration. Therefore, more evidence-based research is needed by adopting a context-sensitive approach to create the necessary bases that help advance into the micro foundations of context.

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