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Better safe than sorry: labor market regulation and cash holdings of founding family firms

Markus Fütterer and Marina Kononova
School of Business and Economics, Accounting and Finance Group, Philipps-Universität Marburg, Marburg, Germany, and

Marc Steffen Rapp
School of Business and Economics, Accounting and Finance Group, Philipps-Universität Marburg, Marburg, Germany, and
Center for Corporate Governance, Department of Accounting, Copenhagen Business School, Copenhagen, Denmark

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Abstract

We study the impact of labor market regulation (LMR) on the cash holdings of founding family firms (FFFs). Analyzing publicly listed firms across 17 European countries, we find compelling evidence that FFFs increase their cash holdings in response to tightening LMR, relative to other firms. Consistent with intuition, this pattern is particularly pronounced in domestic and labor-intensive firms. After exploring the underlying mechanisms, we document that FFFs respond to stricter LMR by increasing long-term debt issuance and reducing dividend payouts more than other firms. Overall, our findings suggest that FFFs, relative to other firms, prioritize financial flexibility over bargaining power considerations when facing tighter labor markets, helping to reconcile the previously mixed evidence on the relationship between LMR and corporate cash holdings.

Keywords Cash, Liquidity, Family firms, Labor market regulation, Financial flexibility

Paper type Research paper

> For most companies, cash is like oxygen. You don't think about it when you have enough, but when you start running low, it's all you think about.
>
> —Boston Consulting Group (2020), A Cash Management Survival Guide.

1. Introduction

"Revenue is vanity, profit is sanity, but cash is king" the saying goes. Indeed, firms rely on cash to finance their day-to-day operations and, thus, must maintain adequate cash reserves on their balance sheets. Arguably, firms decide the level of these cash holdings by trading off costs versus benefits (Bates *et al.*, 2009; Harford *et al.*, 2008; Pinkowitz and Williamson, 2007; Opler *et al.*, 1999; Kim *et al.*, 1998). Labor market regulation might affect this cost-

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benefit trade-off and has been identified as an important determinant of firms' cash holdings (e.g., Beuselinck *et al.*, 2021). However, while some authors document that firms increase their cash holdings when faced with more stringent labor market regulation (e.g., Karpuz *et al.*, 2020), others find the opposite result (e.g., Klasa *et al.*, 2009; Shin *et al.*, 2018). In this paper, we argue that heterogeneity of shareholder preferences—in particular, socio-economic wealth considerations of family firms as pioneered by Gómez-Mejía *et al.* (2007)—may help partially explain these (presumably) contradictory findings. More specifically, we hypothesize that family firms increase their cash holdings relative to other firms in response to tightening labor regulations. Ultimately, we argue that the effect of labor market regulation on cash holdings identified in empirical studies depends on (among other aspects) the proportion of family firms in the sample.

Labor market regulation may impact firms' cash holdings along two lines. First, tighter labor market regulation affects firms' cost structures as labor costs become more sticky, and operating leverage increases as a result (Kahl *et al.*, 2019; Mauer and Triantis, 1994; Mandelker and Rhee, 1984). Increasing operating leverage implies that firm earnings become more volatile, and firms are more likely to face financial constraints, and ultimately, higher bankruptcy risk (Claessens and Ueda, 2020). Thus, subject to tighter labor market restrictions, firms may increase their cash holdings to foster their financial flexibility (Karpuz *et al.*, 2020) [1]. Second, firms might be reluctant to passively accept the increase in labor cost stickiness and react by establishing counter-measures. As such, they may reduce their cash holdings to improve their bargaining position (against employees), aiming to reduce the rent extraction potential of employees (e.g., Klasa *et al.*, 2009; Shin *et al.*, 2018). While the first perspective on firms' response to labor market regulation is known in the literature as the "financial flexibility view", the latter is often referred to as the "bargaining power view" (e.g., Chino, 2016; Simintzi *et al.*, 2015; Matsa, 2010; Klasa *et al.*, 2009).

Arguably, shareholder preferences might play a crucial role in the question of which of the two views will dominate in the firm-specific cost-benefit analysis, and thus, determine a firm's response to labor market regulation. Indeed, Grossman and Stiglitz (1977) and others argue that shareholder unanimity (on a firm's production and financing decisions) is only obtained under relatively strict assumptions. Yet, the existing literature has largely ignored firms' ownership structures when examining the labor-finance linkage and assessing the explanatory power of both views [2]. We aim to partially close this gap by examining a specific type of shareholder: founding families.

The literature attributes very specific preferences to founding families, which are often referred to as *socioemotional wealth (SEW) motives* and the intention to preserve their legacy and ensure the business's continued existence for the benefit of future generations (e.g., Berrone *et al.*, 2012; Gomez-Mejia *et al.*, 2011; Gómez-Mejía *et al.*, 2007). This literature assumes that founding families have preferences for financial policies that safeguard firm continuity (e.g., Schmid, 2013), suggesting that founding family firms (FFFs) will increase their cash holdings in response to tightening labor market regulations. Moreover, it is argued that FFFs establish long-lasting and stable relationships with employees (Bennedsen *et al.*, 2019; Huang *et al.*, 2015; Lansberg, 1983, 1988; Sraer and Thesmar, 2007) as founding families view human capital as a relevant asset and not only as a counterpart claiming firms' surpluses (see, e.g. Stavrou *et al.*, 2007). This reasoning suggests that FFFs will react less to an increase in the labor force's bargaining advantage and the associated rent extraction potential. Therefore, they are less likely to reduce the level of cash holdings in response to tightening labor market regulations. Finally, the literature he literature suggests that FFFs tend to exhibit risk-averse behavior (Anderson *et al.*, 2012; Anderson and Reeb, 2004). As such, FFFs are expected to assign higher costs

to financial risk compared to other firms. Consequently, they arguably have a strong interest in reducing financial risk and thus building up additional cash reserves in response to tightening labor market regulations. In summary, these arguments suggest that "financial flexibility" considerations might be more important for FFFs when deciding their response to labor market regulation, while "bargaining power" arguments might be more relevant for other firms. As such, we hypothesize that, relative to other firms, FFFs will, *ceteris paribus*, increase (decrease) their cash holdings in response to tightening (easing) labor market regulation.

To empirically test our assertion, we study a sample of 4,693 non-financial listed firms from 17 European countries over the 10-year period 2007–2016. We apply a four-step screening process to identify and classify founding family firms in our sample. *First*, we collect annual ultimate ownership information from Bureau van Dijk's OSIRIS database using a threshold of 25% of the voting rights. *Second*, we inspect the time series of each firm and carefully cross-validate potential problems in the initial OSIRIS data (e.g., when firm i has ultimate owner j in year $t-1$ and $t+1$, but not in year t). *Third*, we identify all firms for which OSIRIS reports (at least once during the sample period) the presence of a family or individual as an ultimate owner. *Fourth*, we manually collect information for these firms on their founders, their relatives, and their (family) relation to the ultimate owner in the respective firm-year(s). Following Anderson and Reeb (2003) and others, we assign firms with an FFF status if there is a direct familial (consanguineous or marital) connection between the ultimate owner and the founder(s). In sum, this process provides us with a dummy variable indicating a firm's (year-by-year) FFF status [3]. To proxy for frictions in the labor market, we use the data from the Economic Freedom of the World index provided by the Fraser Institute and construct a labor market regulation index (LMR) as an equally weighted average of the following sub-indicators: (i) the impact of minimum wages, (ii) hiring and firing practices, (iii) the share of the labor force whose wages are set by centralized collective bargaining, and (iv) the mandated cost of worker dismissal (see Section 2.2.2).

A simple sample-split analysis using mean comparisons shows that, in the full sample, cash holdings do not differ substantially between FFFs and non-FFFs. However, restricting the sample to high (low) LMR environments, we find that FFFs hold significantly more (marginally less) cash than non-FFFs. In high LMR settings, the magnitude of this difference is economically meaningful, amounting to approximately 14% of the average non-FFF's cash holdings.

We confirm this pattern using regression analysis. Our baseline regression model explains the level of cash holdings while controlling for firm and industry-year fixed effects, a country-specific year trend, and a range of firm- and country-level characteristics. To account for potential correlations within countries, we cluster standard errors at the country level. To ensure the robustness of our results, we conduct several additional tests, detailed in the Online Appendix. First, we examine the sensitivity of our findings to different methods of estimating standard errors by re-estimating our model with alternative clustering approaches. Second, we employ an alternative regression specification that focuses on incremental cash holding decisions. Third, we control for potential confounding events and their interaction with the FFF variable to address concerns about omitted variable bias. Finally, we test the robustness of our results using alternative definitions of cash holdings and different measures of LMR.

Overall, we find compelling evidence that FFFs respond to tighter labor market regulation by increasing their cash levels relative to other firms, and some evidence that other firms reduce their cash holdings in response to stricter LMR. In terms of economic significance, a 1% *increase* in LMR materializes in a 0.083% increase in cash holdings in the average FFF, whereas the average non-FFF reacts with a 0.110% *decrease* in cash holdings (see Section 3.3). In sum, the average differential elasticity amounts to 0.193%, which results in a

difference of 11.6% (7.7%) of the median (average) firm's cash holding, assuming a shift from a 25%-LMR-quantile country to a 75%-LMR-quantile country.

To shed further light on the FFF-specific response to LMR and to strengthen our arguments, we also study the role of labor costs and the role of operating risk for FFFs' response to LMR. The analysis of labor costs aims to strengthen the argument that the observed pattern is caused by variations in LMR. Consistent with the idea that country-specific LMR is particularly important for labor costs in labor-intense firms and domestic firms, we find that the FFF-specific response to LMR is more pronounced in these companies. The average differential elasticity increases from 0.193% for the average firm to 0.404% in labor-intensive firms and to 0.543% in domestic firms. Assuming a shift from a 25%-LMR-quantile country to a 75%-LMR-quantile country, the average differential elasticity corresponds to 22.7% (16.2%) and 36.6% (21.7%) of the median (average) cash holdings in labor-intensive and domestic firms, respectively. The analysis of operating risk reinforces the argument that risk mitigation and a precautionary demand for cash holdings drive the FFF-specific response to tighter LMR. Consistent with this, we find that the FFF-specific response to LMR is more pronounced in FFFs with business models characterized by higher operating risk.

While these findings already suggest a causal interpretation of the FFF-specific cash holdings response to LMR, we also directly address key identification challenges common to cross-country studies that may contest this interpretation (e.g., Bennedsen *et al.*, 2019). First, we tackle the concern that FFF status is an endogenous choice by employing an instrumental variable (IV) approach. When instrumenting for FFF status, we find support for a causal interpretation of the FFF-specific response of cash holdings to LMR. Second, we guard against possible alternative explanations on firm-level for our findings. The main concern here is that systematic differences between FFFs and non-FFFs may drive the observed relationship in our baseline model. To address this, we conduct two robustness tests. First, we re-estimate our baseline model on a propensity score-matched sample of FFFs and comparable non-FFFs. Second, we run horserace regressions between FFF status and firm characteristics that plausibly correlate with financial flexibility considerations in the cash-labor relationship while also being linked to FFF status. In both cases, we continue to observe an FFF-specific response of cash holdings to LMR, reinforcing that our baseline results are not merely driven by alternative explanations.

Finally, we study the channels through which FFFs and non-FFFs adjust their cash holdings in response to tightening LMR. We find that non-FFFs respond to strengthened LMR by increasing dividends. In contrast, FFFs increase their cash flow from financing activities, in particular their debt issuance activities, while reducing dividends. Notably, neither FFFs nor non-FFFs seem to adjust their investment activities. These results further reinforce our main findings, suggesting that the observed LMR-induced changes in cash holdings stem from deliberate financial policy adjustments rather than being a mere byproduct of shifts in other corporate policies.

Our study contributes to various streams of literature. First, we add to the growing strand of research examining the relationship between labor market regulation and cash holdings. So far, the literature provides mixed evidence when examining bargaining power and financial flexibility arguments (e.g., Beuselinck *et al.*, 2021; Karpuz *et al.*, 2020; Cui *et al.*, 2018; Shin *et al.*, 2018; Ghaly *et al.*, 2015; Schmalz, 2013; Klasa *et al.*, 2009). In this study, we suggest that the cost-benefit analysis is very much firm-specific, and preferences of shareholders – specifically socioemotional wealth considerations of founding families – play a critical role in the question of which of the two views will ultimately dominate on a firm level. With empirical evidence supporting this argument, our study can help to reconcile

previously ambiguous results, as our findings suggest that the overall effect identified in empirical research may depend on the proportion of family firms in the sample.

Second, we complement the growing literature on the behavior of family firms (Bennedsen *et al.*, 2019; Chen *et al.*, 2008; Wang, 2006). Our evidence corroborates socioemotional wealth arguments suggesting that family firms are more likely to focus on firm survival and retaining control over their business, rather than on mere wealth maximization which would require limiting the rent extraction potential of employees (see e.g. Breton-Miller *et al.*, 2015; Berrone *et al.*, 2012; Gomez-Mejia *et al.*, 2011; Gómez-Mejía *et al.*, 2007). Third, we contribute to the ongoing discussion about the independent role of cash holdings in corporate financial policy, providing supportive evidence for the theoretical predictions of Acharya *et al.* (2007) and Gamba and Triantis (2008) that firms facing operating or financial frictions prefer to save their internal funds to increase the cash buffer and reduce the risk of financial distress. Finally, our study complements research documenting that not only organizational form but also the type of blockholder matters when investigating corporate policy decisions (Glossner *et al.*, 2020; Perotti, 1995).

The remainder of the paper is structured as follows: Section 2 introduces the data. Section 3 presents empirical results. Section 4 explores endogeneity concerns and alternative explanations. Section 5 examines the sources of cash increases. Section 6 concludes.

2. Data and summary statistics

This section introduces the sample, the variable construction and presents descriptive statistics.

2.1 Sample

Our sample consists of all – active and inactive – publicly listed firms from 17 European countries [4], which are covered in OSIRIS and Datastream/Worldscope simultaneously for the period from 2007 to 2016. Following the standard approach, we drop observations with missing, negative or zero-values of total assets and total shareholders' equity. We also exclude firms from the financial sector (Standard Industrial Classification (SIC) codes 6000–6999). Furthermore, we do not consider firm-years that have experienced reorganization [5]. Finally, we require non-missing contemporary values for the cash holding variables, the measure for labor regulation, as well as non-missing values for one-year lagged control variables.

The final sample is an unbalanced panel that includes (a maximum of) 28,113 firm-year observations from 4,693 unique firms. Founding family firms account for 6,215 (22%) firm-year observations, corresponding to 977 (21%) unique family firms in the sample.

2.2 Variable construction

2.2.1 Founding family firms. Building on socioemotional wealth arguments, we opt for a relatively strict family firm definition that aims to ensure simultaneously:

- effective control of the family; and
- identification of the family with the company.

With regard to effective control, we apply a 25% threshold on voting rights as well as the condition of ultimate ownership (Bennedsen *et al.*, 2019; Lins *et al.*, 2010; Franks *et al.*, 2012). To capture identification of the family with the company, we focus on *founding families*, i.e. founders and their relatives. Evidence for a strong relation of the founder to the firm can frequently be observed e.g. by the identity of the family name and the name of the

company (Berrone *et al.*, 2012; Gómez-Mejía *et al.*, 2007; Westhead *et al.*, 2001). In sum, we are interested in identifying firms, where the founding family is the ultimate owner of the firm at a threshold of 25%.

We apply a four-step screening process to identify such firms in our sample. *First*, we collect annual ownership information from Bureau van Dijk's, a data provider well-known in the family firm literature (e.g., Bennedsen *et al.*, 2019; Gnoth *et al.*, 2024; Lins *et al.*, 2013). To ensure that we are able to track complex ownership structures of European firms even throughout a network of multiple intermediate firms, we rely on the "Global ultimate owner" (GUO) variable [6] from the OSIRIS database using a threshold of 25%. *Second*, we inspect the time-series of each firm and carefully cross-validate *anomalies* in the initial OSIRIS data, i.e. when a firm *i* has an ultimate owner *j* in year $t-1$ and $t+1$, but not in t [7]. *Third*, we identify all firms with a person or family as global ultimate owner in any given year. *Fourth*, we manually collect founder information. To identify the founders of a company we use publicly available sources like annual reports, the company's website or news articles. We then complement this by collecting information on the relation between the reported ultimate-owner and the company's founders.

Ultimately, we classify a firm as a founding family firm in year *t*, if:

- the firm has an ultimate-owner possessing at least 25% of a firm's voting rights in year *t*; and
- the ultimate-owner is related by blood or marriage to at least one of the founders of the company.

Based on this classification, we construct a dummy variable that is equal to one for founding family firms, and zero otherwise. In contrast to other studies building upon (partly) time constant family firm definitions (i.e. Schmid (2013); Pindado *et al.* (2011, 2012)) our approach provides us with a yearly varying FFF variable allowing us to use firm fixed effects regression models in the analysis to control for firm-specific heterogeneity.

2.2.2 Labor market regulation. To operationalize the strictness of labor market regulation in a particular country in our sample, we use sub-indicators on labor market regulations from the Economic Freedom of the World (EFW) index provided by the Fraser Institute [8] and widely used in labor economics studies (e.g., Edmans *et al.*, 2020; Sturm and De Haan, 2015; Bernal-Verdugo *et al.*, 2012; Feldmann, 2009; Siegel and Larson, 2009; Freeman *et al.*, 2008) [9]. Since the EFW index is available for a long time period over 2000–2017 for most countries all over the world, it allows us to estimate the family-firm related relationship between cash holdings and labor for our entire sample. While labor market regulation is a multidimensional concept, the sub-indicators of the EFW [10] cover various features and manifestations that are responsible for the frictions at the labor market. In our study, we focus on four sub-indicators referring to:

(1) the impact of minimum wages;
(2) hiring and firing practices;
(3) the share of labor force, whose wages are set by centralized collective bargaining; and
(4) the mandated cost of worker dismissal.

These four sub-indicators cover the dimensions that have been used by previous studies, examining the relation between firms' financial policy and labor regulation, to proxy for labor market frictions [11].

Each sub-indicator is continuous and can take any values in the range from 0 to 10, with higher scores representing higher economic freedom and thus, less strict labor regulation. To benefit from higher variation, we aggregate four sub-indices to one index on the labor market

regulation index (*LMR*) as an equally weighted average [12]. For ease of interpretation, we subtract the value of the index from 10, such that high values of the index now correspond to more rigid labor market regulations. As each sub-indicator varies within as well as across countries, our *LMR* index allows for time-series and cross-sectional analysis.

2.2.3 Cash holdings. We define different measures of cash holdings. First, we follow Barbalau *et al.* (2022); Karpuz *et al.* (2020); Bates *et al.* (2009) and others and define *Cash* as the sum of cash and short-term investments divided by the book value of total assets. Second, we follow Opler *et al.* (1999) and define *CashToNetAssets* as the sum of cash and short-term investments divided by the book value of net assets, i.e. total assets net of cash and short-term investments. Since previous literature indicates that the latter measure might be prone to outliers (e.g., Bates *et al.*, 2009; Foley *et al.*, 2007), we use *Cash* as the primary and *CashToNetAssets* as an alternative measure. Finally, in unreported additional tests, we also measure cash holdings as the cash-to-sales ratio. Restricting the sample to firms with positive sales exceeding €1mio (e.g., Hovakimian and Li, 2011), the results of this exercise support the results presented below.

2.2.4 Controls. We add firm-level and country-level controls to our regression models. Firm-level controls are motivated by the studies of Opler *et al.* (1999); Song and Lee (2012); Graham and Leary (2018) and include: firm size (*Size*) defined as the natural logarithm of the book value of total assets; market-to-book-ratio (*Growth*) defined as the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets; total debt to total assets (*Leverage*); net working capital to total assets (*NWC*); investments defined as the sum of capital expenditures, acquisitions, and R&D-expenditures to total assets (*Investment*); dividends defined as a dummy variable that equals one if a firm pays cash dividends in a particular year, and zero otherwise (*Dividend Dummy*); cash flow to total assets, where cash flow is defined as earnings after interest, dividends, and taxes but before depreciation (*Cash Flow*); and industry cash flow volatility defined as the average of the firm's standard deviation of cash flows for each country-industry (classified by 48 Fama-French industries) in a particular year, where the firm–year standard deviation of cash flow to assets is calculated for the previous five years (*Cash Flow Volatility*). In case that fewer than five years of lagged data are available, the standard deviation is calculated over all available years, but is set to missing if fewer than 3 years are available (see Graham and Leary, 2018). Additionally, we control for firms with blockholders possessing at least 25% of a firm's voting rights but not being a founding family firm (*Other Ultimate Owner*). The variable is defined as a dummy variable equal to one if a firm has an *Other Ultimate Owner* in a particular year and zero otherwise. All continuous variables are winsorized at the 1% and 99% levels to remove the influence of outlier observations.

Finally, to account for macroeconomic conditions that might influence cash holdings and at the same time be responsible for changes in labor regulations, all regressions include the following country-level variables: the inflation rate (*Inflation*) to control for the opportunity costs of holding cash; the growth of the gross domestic product (*GDP Growth*) and the natural logarithm of GDP per capita ($ln(GDP\,pc.)$) to proxy for aggregate investment opportunities (Duong *et al.*, 2020; Graham and Leary, 2018). Table A1 in the Appendix provides detailed descriptions of all variables used in this study.

2.3 Summary statistics

Panel A of Table 1 reports summary statistics for the full sample. The average cash holdings (*Cash*) in our sample are approximately 15%, and 25% when measured in terms of *CashToNetAssets*. These numbers are fairly close to those of Karpuz *et al.* (2020).

The average sample firm has 3,215 million EUR in total assets, with *NWC* accounting for 1.8% of total assets. The average firm trades at a market-to-book ratio of 1.9, has debt that

Table 1. Summary statistics

Variable	N	Mean	STD	Q1	Median	Q3
Panel A: Full sample						
Firm level						
Cash	28,113	0.146	0.151	0.044	0.097	0.191
CashToNetAssets	28,113	0.249	0.520	0.046	0.107	0.236
Fff	28,113	0.221	0.415	0.000	0.000	0.000
$Size_{(t-1)}$	28,113	12.547	2.210	10.961	12.336	14.025
$Growth_{(t-1)}$	28,113	1.888	1.705	0.947	1.358	2.140
$Leverage_{(t-1)}$	28,113	0.205	0.170	0.053	0.183	0.318
$Nwc_{(t-1)}$	28,113	0.018	0.168	–0.084	0.011	0.122
$Investments_{(t-1)}$	28,113	0.086	0.111	0.022	0.053	0.105
$Dividends_{(t-1)}$	28,113	0.613	0.487	0.000	1.000	1.000
Cash $flow_{(t-1)}$	28,113	0.029	0.141	0.015	0.054	0.089
Cash flow $volatility_{(t-1)}$	28,113	0.094	0.120	0.041	0.066	0.116
Other ultimate owner	28,113	0.319	0.466	0.000	0.000	1.000
Country level						
LMR	170	4.011	1.361	3.341	4.326	4.946
LMR^{LC-I}	170	–0.247	0.798	–1.000	0.000	0.000
$Inflation_{(t-1)}$	170	0.015	0.014	0.004	0.015	0.025
GDP $growth_{(t-1)}$	170	0.009	0.033	–0.003	0.013	0.024
ln(GDP p.c.)$_{(t-1)}$	170	10.759	0.400	10.582	10.740	10.937
Panel B: Labor-intensive firms						
Firm level						
Cash	12,098	0.139	0.134	0.047	0.099	0.183
CashToNetAssets	12,098	0.215	0.394	0.050	0.109	0.225
FFF	12,098	0.245	0.430	0.000	0.000	0.000
$Size_{(t-1)}$	12,098	12.308	2.064	10.888	12.198	13.611
$Growth_{(t-1)}$	12,098	1.946	1.730	0.982	1.409	2.225
$Leverage_{(t-1)}$	12,098	0.193	0.156	0.055	0.173	0.300
$NWC_{(t-1)}$	12,098	0.020	0.164	–0.083	0.023	0.131
$Investments_{(t-1)}$	12,098	0.087	0.110	0.025	0.054	0.104
$Dividends_{(t-1)}$	12,098	0.639	0.480	0.000	1.000	1.000
Cash $flow_{(t-1)}$	12,098	0.032	0.146	0.022	0.058	0.092
Cash flow $volatility_{(t-1)}$	12,098	0.097	0.123	0.043	0.069	0.120
Other ultimate owner	12,098	0.310	0.463	0.000	0.000	1.000
Panel C: Domestic firms						
Firm level						
Cash	7,027	0.155	0.174	0.032	0.092	0.208
CashToNetAssets	7,027	0.297	0.633	0.034	0.102	0.263
FFF	7,027	0.290	0.454	0.000	0.000	1.000
$Size_{(t-1)}$	7,027	11.622	1.932	10.285	11.420	12.693
$Growth_{(t-1)}$	7,027	1.860	1.809	0.902	1.278	2.037
$Leverage_{(t-1)}$	7,027	0.192	0.180	0.024	0.148	0.313
$NWC_{(t-1)}$	7,027	0.016	0.182	–0.099	0.002	0.130
$Investments_{(t-1)}$	7,027	0.073	0.104	0.014	0.038	0.087

(*continued*)

Note(s): Continued

Variable	N	Mean	STD	Q1	Median	Q3
Dividends$_{(t-1)}$	7,027	0.537	0.499	0.000	1.000	1.000
Cash flow$_{(t-1)}$	7,027	0.014	0.165	0.005	0.048	0.084
Cash flow volatility$_{(t-1)}$	7,027	0.095	0.105	0.040	0.065	0.118
Other ultimate owner	7,027	0.292	0.455	0.000	0.000	1.000

Note(s): Panel A reports the summary statistics for key dependent and independent variables for the whole sample of 4,693 firms and 28,113 firm-year observations from 17 European countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom), over the period 2007–2016. Panel B reports the summary statistics for key dependent and independent variables for the subsample of labor-intensive firms, consisting of 2,708 firms and 12,098 firm-year observations. Panel C reports the summary statistics for key dependent and independent variables for the subsample of domestic firms, consisting of 1,245 firms and 7,027 firm-year observations. All variables are defined in Table A1 in the Appendix

makes up for 20.5% of total capital, invests 8.6% of total assets per year, has a positive cash flow, which amounts to 2.9% of total assets, with a volatility of 9.4% as the average over all industries. More than half of all firms (61.3%) in the sample pay dividends and 31.9% have other ultimate owners. 22.1% of all firm-year observations in the sample refer to founding family firms (*FFF*).

The *LMR* index has a mean value of 4.011 and a standard deviation of 1.361, revealing substantial cross-country variation. Figure 1 shows the staggered character of LMR changes and variation within countries. In total there are 74 increases and 96 decreases in *LMR* that are fairly evenly distributed across countries and through the sample time. The average country has an *Inflation* rate of 1.5%, a *GDP growth* of 0.9% and a GDP p.c. amounting for 44,606U.S. Dollar.

3. Empirical results

This section presents our empirical results. Section 3.1 begins with simple *t*-tests before introducing our baseline regression results. Section 3.2 examines cross-sectional heterogeneity, while Section 3.3 discusses the economic significance of our findings. Robustness checks are provided in the Online Appendix.

3.1 Baseline analysis

To study the role of FFFs in the relationship between firms' cash holdings and labor market regulations, we proceed in two steps.

First, we use simple t-test to compare cash holdings of FFFs and non-FFFs in different subsamples, depending on the level of labor market regulation in the firm's country of domicile. Results of this exercise are reported in Table 2.

Interestingly, there is not too much of a difference between FFFs and non-FFFs cash holdings for the full sample. Indeed, in terms of *Cash*, the difference is statistically insignificant. In terms of *CashToNetAssets*, the difference is significant on the 5% level, but fairly small with 1.6 percentage points.

Looking at the differences in means between FFFs and non-FFFs in Table 2, we see that for low LMR country-year observations the difference is −0.006 for *Cash* and −0.056 for *CashToNetAssets* and thus lower than the difference in the full sample (+0.002 for *Cash* and

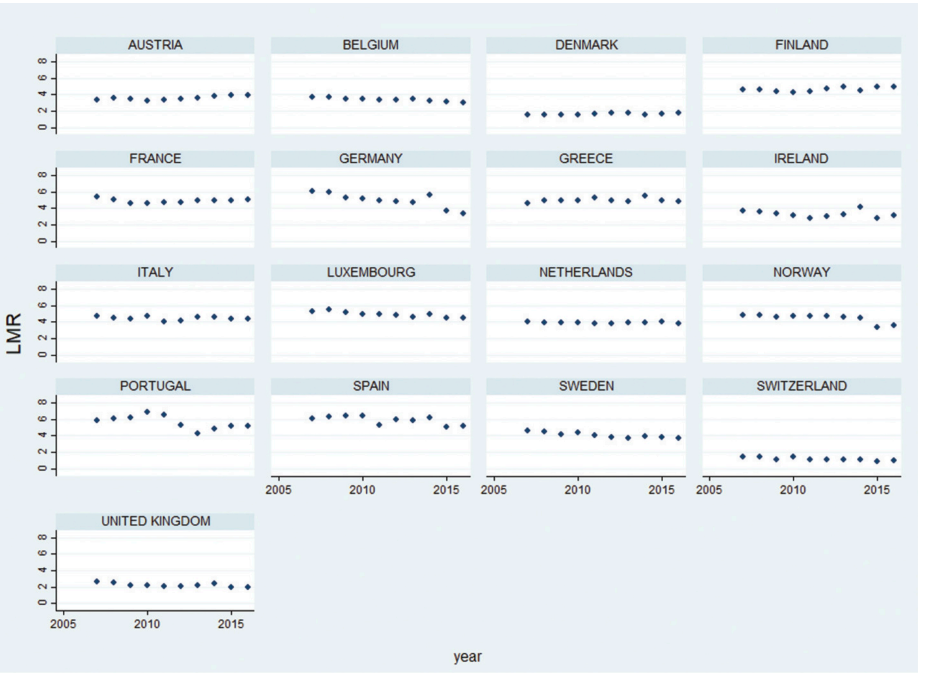

Figure 1. LMR By country

Note(s): This figure plots the evolution of LMR index by country for each of the 17 countries in the sample over the period 2007–2016

Table 2. Cash holdings of FFF and non-FFF

	Family firms		Non-Family firms				
	Observations	Mean	Observations	Mean	Diff	*t*-statistic	*p*-value
Panel A: Cash							
Full sample	6,215	0.147	21,898	0.145	0.002	0.78	0.43
Low LMR country-years (LMR < *Q*10%)	241	0.168	1,499	0.173	–0.006	–0.52	0.30
High LMR country-years (LMR ≥ *Q*90%)	543	0.155	1,386	0.135	0.019	2.58	0.01
Panel B: CashToNetAssets							
Full sample	6,215	0.237	21,898	0.253	–0.016	–2.19	0.03
Low LMR country-years (LMR < *Q*10%)	241	0.262	1,499	0.318	–0.056	–1.29	0.10
High LMR country-years (LMR ≥ *Q*90%)	543	0.267	1,386	0.221	0.046	1.92	0.03

Note(s): This table compares cash holdings of FFF and non-FFF. Thereby it differentiates between the full sample and country-year observations with low and high LMR. Panel A reports results for Cash, Panel B for CashToNetAssets. Variables are defined in Table A1 in the Appendix

−0.016 for *CashToNetAssets*) and vice versa for high LMR country-year observations [13]. Moreover, while for low LMR country-year observations the differences are negative, they are positive for high LMR country-year observations (+0.019 for *Cash* and +0.046 for *CashToNetAssets*). The underlying mechanism for the pattern is that non-FFF seem to react more cautiously to strengthening LMR than FFF do. Both observations support our hypothesis that family firms will increase their cash holdings in response to tightening labor regulations relative to other firms.

Second, we extend the regression model adopted by prior literature (see e.g. Cui *et al.*, 2018; Klasa *et al.*, 2009) for an interaction term between *FFF* and *LMR* as follows:

$$Cash_{it} = \beta_1 LMR_{ct} + \beta_2 LMR_{ct} \times FFF_{it} + \beta_3 FFF_{it} + \beta_C Controls_{cit-1} + \theta_{i,c,jt} + \varepsilon_{it}. \quad (1)$$

where $Cash_{it}$ measures cash holdings of firm i at time t, LMR_{ct} the extent of labor market regulation in country c (the country of domicile of firm i) at time t, FFF_{it} indicates the FFF status of firm i at time t, and $Controls_{cit-1}$ refers to control variables on (firm- and country-level) as discussed in section 2.2.4. Moreover, θ_{cjt} denotes the set of fixed effects and ε_{it} the error term. When estimating Model (1) we allow for:

- firm-fixed effects to control for unobserved time-invariant firm characteristics;
- industry-year fixed effects (based on 48-Fama-French industry classification) to control for possible unobserved time-varying industry shocks that might affect firms' cash holdings (e.g., Chen *et al.*, 2018; Gao *et al.*, 2013; Harford *et al.*, 2008);
- country-specific year trends to control for linear developments that might coincide with changes in *LMR*; and
- standard errors that are robust to within-country correlation of residuals, as *LMR* changes vary at the country level [14].

Our variables of interest in Model (1) are LMR_{ct} referring to the extent of labor market regulation in country c, and, more importantly, its interaction with FFF_{it}, the dummy variable indicating the FFF status of firm i at time t. As such, we are interested in β_1 and, more specifically, in β_2, and our prediction is $\beta_2 > 0$.

Table 3 reports estimates of Model (1) with and without the interaction term, for *Cash* (Columns 1 and 2) and *CashToNetAssets* (Columns 3 and 4). Before looking at the coefficients of interest, we note that all firm-level control variables have signs predicted by the literature. *Size*, *Leverage*, *NWC*, and *Investment* are negatively related to cash holdings and statistically distinguishable from zero. The coefficients on *Growth*, *Dividend Dummy*, *Cash Flow*, *Cash Flow Volatility*, and *Other Ultimate Owner* show a positive sign, whereby only the coefficient on *Growth* is statistically significant through all specifications. The coefficients on the country-level controls are mostly statistically insignificant.

Columns 1 and 3 show the regression results for the reduced form of Model (1), i.e. excluding the interaction term $LMR_{ct} \times FFF_{it}$. For both definitions of cash holdings, the coefficient estimate for *LMR* has a negative sign, consistent with the "bargaining power view". However, in both cases the coefficients are statistically insignificant at conventional levels.

Columns 2 and 4 present estimation results of Model (1) with interaction between *LMR* and the *FFF* status. Two observations stand out. First, consistent with the "bargaining power view", the estimated coefficient for LMR_{ct}, i.e. the LMR-sensitivity estimate for non-FFF, is negative and statistically significant at the 5% level for both definitions of cash holdings.

Table 3. Family-firm related effect of LMR on cash holdings

	Cash		CashToNetAssets	
Dependent variable	(1)	(2)	(3)	(4)
LMR	–0.002 (−1.07)	–0.004** (−2.56)	–0.009* (−1.83)	–0.016** (−2.66)
LMR#FFF		0.007*** (3.36)		0.024** (2.28)
FFF		–0.027*** (−5.25)		–0.088*** (−3.92)
$Size_{(t-1)}$	–0.025*** (−3.68)	–0.025*** (−3.66)	–0.044* (−1.76)	–0.044 (−1.74)
$Growth_{(t-1)}$	0.004*** (3.43)	0.004*** (3.47)	0.016*** (3.47)	0.016*** (3.48)
$Leverage_{(t-1)}$	–0.089*** (−11.41)	–0.089*** (−11.39)	–0.219*** (−6.25)	–0.219*** (−6.19)
$NWC_{(t-1)}$	–0.048** (−2.29)	–0.048** (−2.29)	–0.157** (−2.61)	–0.157** (−2.61)
$Investments_{(t-1)}$	–0.053*** (−3.09)	–0.053*** (−3.08)	–0.139** (−2.58)	–0.139** (−2.56)
$Dividends_{(t-1)}$	0.005*** (3.20)	0.005*** (3.21)	0.009 (1.71)	0.009 (1.69)
$Cash\ flow_{(t-1)}$	0.014 (1.10)	0.014 (1.10)	0.015 (0.30)	0.014 (0.30)
$Cash\ flow\ volatility_{(t-1)}$	0.009 (1.39)	0.009 (1.39)	0.036* (1.79)	0.036* (1.79)
Other ultimate owner	0.001 (0.22)	0.001 (0.32)	0.005 (0.37)	0.006 (0.48)
$Inflation_{(t-1)}$	–0.080 (−1.08)	–0.081 (−1.08)	0.096 (0.34)	0.094 (0.33)
$GDP\ growth_{(t-1)}$	–0.047 (−1.36)	–0.043 (−1.23)	–0.044 (−0.29)	–0.033 (−0.21)
$\ln(GDP\ p.c.)_{(t-1)}$	0.085*** (3.04)	0.085*** (3.01)	0.070 (0.67)	0.069 (0.66)
Firm fixed effects	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level
Observations	28,113	28,113	28,113	28,113
R^2_{adj}	0.057	0.058	0.036	0.037

Note(s): This table presents the OLS regression results of average (Columns 1 and 3) and FFF-related differential (Columns 2 and 4) effect of LMR on cash holdings. Column 1 and 2 (3 and 4) show the results for Cash (CashToNetAssets) as dependent variable. All variables are defined in Table A1 in the Appendix. All independent variables except LMR, FFF, and Other Ultimate Owner are lagged by one period. All regression specifications include firm fixed effects, industry-year fixed effects, and country specific year trends. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

Second, the estimated coefficients for the interaction term $LMR \times FFF$ are positive. Also, they are statistically significant at the 1% level in Column 2 and at the 5% level in Column 4. The latter observation supports our hypothesis that FFFs will increase their cash holdings in response to tightening labor market regulation relative to non-FFFs, and provides suggestive evidence for the idea that that "financial flexibility" considerations might be more important for FFFs when deciding about their response to labor market regulation, while "bargaining power" arguments might be more relevant for other firms.

3.2 Cross-Sectional heterogeneity

This section examines cross-sectional heterogeneity in the previously documented FFF-specific response to LMR to strengthen our arguments. In Section 3.2.1, we examine the role of labor costs, aiming to strengthen the argument that the observed pattern is caused by variations in LMR. In Section 3.2.2, we examine the role of operating risk to strengthen the argument that risk mitigation arguments and a precautionary demand for cash holdings in FFFs after tightening LMR can help to explain the observed pattern.

3.2.1 Is it about LMR?. We propose two test to strengthen our argument that the observed pattern is caused by variations in LMR. Both build on the idea that labor regulation alters labor costs, and thus the extent of labor costs exposed to changes in LMR should matter for the response to LMR changes.

First, we argue that labor regulation should be particularly relevant for labor intense firms, where labor represent an important production factor. To test this prediction, we split the sample into two subsamples, depending on whether a firm's labor intensity is above (equal or below) the median in the affiliate industry in a particular year and estimate Model (1) on each of the subsamples separately. To classify firms, we follow Hilary (2006) and calculate firm's labor intensity as the number of employees divided by total assets.

Second, we argue that variations in domestic LMR should be less relevant for multinational firms, as these firms have shifted (or can shift) operations to unaffected countries and thus 'escape' tighter labor market regulations in the home country. To test this prediction, we again split the sample into two subsamples: domestic firms versus multinationals. We classify firms as domestic firm, if the firm does not report any foreign assets in the previous three years [15], and as multinational otherwise.

We re-estimate the Model (1) for all sub-samples and present results in Table 4. A first look at the table confirms that while in all specifications our coefficients of interest retain their signs, they vary in size and significance. Moreover, this variation is systematic and consistent with the underlying idea of this exercise: The response to variations in LMR is more salient in labor-intensive firms (compared to other firms) and in domestic firms (compared to multinational firms).

Interested in the FFF-specific response to LMR changes, we then need to look into the differential response across subsamples. Column 1 and 2, as well as 3 and 4, contrast results for the subsample of labor-intense firms versus results for the subsample of other firms. We find the FFF-specific response to LMR changes for labor-intense firms to be almost twice as high in magnitude compared to the average response (i.e. full sample analysis in Table 3) and some five to seven times the response in other firms. These differences also have consequences for the statistical significance of the coefficient estimates on the different subsamples. Column 5 and 6, as well as 7 and 8, contrast results for the subsample of domestic firms versus results for the subsample of multinational firms. We find the FFF-specific response to LMR changes for domestic firms to be three to four times the average response (i.e. full sample analysis in Table 3) and some four to seven times the response in multinational firms. Overall, while we do not test for statistical significance in the differential response (across the different subsample), the results support our notion that the pattern observed in Table 3 is caused by variations in LMR.

3.2.2 Is it about risk?. Risk-aversion and the tendency to engage in risk mitigation is one of the underlying arguments for our hypothesis of an FFF-specific response to variations in LMR. Specifically, we argue that FFFs react with a precautionary demand for cash holdings in response to strengthened LMR, as costs of financial distress are elevated by tighter labor regulation. Following this logic, the impact of tighter LMR should be more pronounced for FFFs with riskier business models, leading them to react more strongly to a change in LMR.

With this idea in mind, we examine whether FFFs that run more risky business models show a stronger response to variations in LMR. We gauge the riskiness of a business model using to proxies. First, we follow Kim and Zhang (2014) and use variations in sales as a proxy for operating risk. We calculate *Sales Volatility* as the standard deviation of sales, deflated by total assets, in the previous five years (Wei *et al.*, 2020), with at least three out of five available firm-year-observations. Second, we follow Karpuz *et al.* (2020) and proxy firm risk using *Cash Flow Volatility*.

Next, we split the sample with respect to the FFF status and estimate the following model on each of the subsamples:

Table 4. Cross-sectional heterogeneity I: is it about LMR?

	Cash		CashToNetAssets		Cash		CashToNetAssets	
Dependent variable	Li	Non-LI	Li	Non-LI	Domestic	Multinational	Domestic	Multinational
Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LMR	–0.007*** (−3.25)	–0.002 (−0.92)	–0.030*** (−3.63)	–0.008 (−0.75)	–0.015*** (−3.87)	–0.001 (−0.98)	–0.055*** (−3.80)	–0.008 (−1.29)
LMR#FFF	0.014*** (2.97)	0.003 (0.54)	0.043*** (3.16)	0.006 (0.37)	0.021*** (4.13)	0.005*** (3.07)	0.085*** (4.36)	0.013* (1.81)
FFF	–0.051*** (−3.61)	–0.004 (−0.15)	–0.167*** (−3.42)	0.001 (0.01)	–0.075** (−2.90)	–0.024*** (−3.80)	–0.349*** (−4.37)	–0.044* (−2.04)
$Size_{(t-1)}$	–0.024*** (−4.94)	–0.032*** (−4.01)	–0.053*** (−3.81)	–0.055 (−1.45)	–0.030*** (−3.42)	–0.025*** (−3.63)	–0.042 (−0.99)	–0.051* (−2.06)
$Growth_{(t-1)}$	0.003** (2.29)	0.005** (2.90)	0.007* (2.01)	0.024** (2.13)	0.005*** (3.29)	0.003** (2.78)	0.033*** (3.26)	0.010** (2.35)
$Leverage_{(t-1)}$	–0.090*** (−9.08)	–0.086*** (−8.98)	–0.152*** (−4.52)	–0.289*** (−5.74)	–0.113*** (−4.18)	–0.079*** (−7.27)	–0.305** (−2.59)	–0.180*** (−3.51)
$NWC_{(t-1)}$	–0.031 (−1.28)	–0.037** (−2.24)	–0.078 (−0.92)	–0.142** (−2.23)	–0.029 (−1.51)	–0.053* (−2.01)	–0.129* (−1.91)	–0.153** (−2.33)
$Investments_{(t-1)}$	–0.051* (−1.90)	–0.050*** (−3.46)	–0.126* (−1.76)	–0.107 (−1.55)	–0.071*** (−4.25)	–0.051** (−2.33)	–0.096 (−0.77)	–0.151* (−1.99)
$Dividends_{(t-1)}$	0.003 (1.33)	0.005 (1.74)	0.005 (0.60)	0.004 (0.53)	0.005 (1.06)	0.005** (2.80)	–0.001 (−0.04)	0.012* (1.92)
$Cash\ flow_{(t-1)}$	0.003 (0.13)	0.013 (1.13)	0.029 (0.42)	–0.016 (−0.31)	0.032** (2.13)	0.008 (0.69)	0.073 (1.61)	–0.000 (−0.01)
$Cash\ flow\ volatility_{(t-1)}$	–0.001 (−0.24)	0.009 (1.52)	0.012 (0.86)	0.018 (1.24)	0.012 (0.90)	0.010 (1.38)	0.050 (0.76)	0.034 (1.45)
Other ultimate owner	0.005 (1.27)	0.001 (0.27)	0.010 (1.08)	0.009 (0.60)	–0.003 (−0.50)	0.002 (0.43)	–0.013 (−0.53)	0.008 (0.68)
$Inflation_{(t-1)}$	–0.089 (−0.86)	–0.089 (−0.75)	–0.129 (−0.57)	0.224 (0.44)	0.129 (0.67)	–0.078 (−0.92)	0.835 (0.80)	0.084 (0.33)
$GDP\ growth_{(t-1)}$	–0.008 (−0.29)	–0.041 (−0.73)	–0.057 (−0.60)	0.033 (0.13)	–0.015 (−0.19)	–0.045 (−1.04)	–0.096 (−0.31)	0.039 (0.20)
$ln(GDP\ p.c.)_{(t-1)}$	0.070 (0.99)	0.065 (1.47)	0.263 (1.73)	–0.057 (−0.29)	0.010 (0.23)	0.103*** (3.25)	0.021 (0.11)	0.030 (0.20)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level	Country-level	Country-level	Country-level	Country-level
Observations	12,098	13,927	12,098	13,927	7,027	21,086	7,027	21,086
R^2_{adj}	0.085	0.090	0.062	0.074	0.123	0.064	0.104	0.041

Note(s): This table presents the results of OLS regression of an FFF-related differential effect of LMR on cash holdings for subsamples based on labor-intensity (Columns 1–4) and multinational presence (Columns 5–8). We measure labor-intensity of firms using the ratio of number of employees to total assets. Each year, we define firms with above (below)-median employees to total assets as high (low)-labor-intensive. We define a firm as domestic, if it does not report any foreign assets in the previous three years, and as multinational otherwise. Column 1 and 2, 5 and 6 (3 and 4, 7 and 8) show the results for Cash (CashToNetAssets) as dependent variable. All variables are defined in Table A1 in the Appendix. All independent variables except LMR, FFF, and Other Ultimate Owner are lagged by one period. All regression specifications include firm fixed effects, industry-year fixed effects, and country specific year trends. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

$$Cash_{it} = \beta_1 LMR_{ct} + \beta_2 LMR_{ct} \times Risk_{it} + \beta_C Controls_{cit-1} + \theta_{i,c,jt} + \varepsilon_{it}. \quad (2)$$

where $Risk_{it}$ denotes sales or cash flow volatility, while all other variables follow the same notation as in Model (1). Table 5 presents the results of this exercise.

Columns 1, 3, 5, and 7 present results for the subsample of *FFF*. In line with the risk mitigation argument, in each Column the coefficient for the interaction term between *LMR* and *Risk* is positive and significant at the 1% level, suggesting that FFFs that are exposed to more risk respond with a higher demand for cash holdings to rising *LMR* [16]. As such, Table 5 provides further supports for our theoretical argument, that risk mitigation intentions represent an important factor for the FFF-specific response to variations in LMR.

3.3 Economic significance

So far, we have only discussed statistical significance of our results. To assess the economic significance of our findings, we use the point estimates of the regression parameters from our baseline findings (Table 3) as well as from the results on labor-intensive and domestic firms (Table 4) and calculate the elasticity measure as dx/dy × (Ø[x]/Ø[y]) for both definitions of cash and with respect to all explanatory variables. Table 6, Columns 1 and 2 show the economic significance using the full sample, Columns 3 and 4 for labor-intensive firms, and Columns 5 and 6 for domestic firms [17] on *Cash* and *CashToNetAssets* respectively.

Based on the universe of all firms in our sample, Column 1 (2) shows, that while a 1% increase in *LMR* produces a 0.110% (0.257%) *decrease* in *Cash* (*CashToNetAssets*) for *non-FFF*, an average *FFF* reacts with 0.083% (0.129%) *increase* in its *Cash* (*CashToNetAssets*) position. Thereby the average *heterogeneous effect* between the two groups amounts for 0.193% (0.386%). As expected, the economic effect is more pronounced in firms that largely rely on labor or cannot shift their production to other, currently less regulated countries. As shown in Column 3 (4), a 1% increase in *LMR* results in 0.202% (0.560%) *decline* in *Cash* (*CashToNetAssets*) for *labor-intensive non-FFF*, but leads to 0.202% (0.243%) *raise* in *Cash* (*CashToNetAssets*) for *labor-intensive FFF*. This corresponds to an average *heterogeneous effect* of 0.404% (0.802%). With regards to *domestic firms*, Column 5 (6) shows that on average *Cash* (*CashToNetAssets*) *diminishes* by 0.388% (0.743%) for each 1% increase in *LMR* for *non-FFF*, but *rises* by 0.155% (0.405%) for *FFF*. This corresponds to a 0.543% (1.148%) difference in the cash holdings' response of *FFF* compared to *non-FFF*.

In comparison, other cash holding determinants have a much lower economic effect in our sample. Only firms' *Size* and $ln(GDP\,pc.)$ show stronger elasticity to cash holdings, albeit $ln(GDP\,pc.)$ is not statistically significant in most of the specifications. The economic effect of *Leverage* on cash holdings is comparable to those of *LMR* in the full sample, but is considerably lower for labor-intensive or domestic firms.

The results in Table 6 indicate that:

- the FFF status has an economically significant impact on the sensitivity of cash holdings' response to changes in LMR; and that
- LMR appears to be an economically important determinant of cash holdings policy in both FFF and non-FFF.

4. Endogeneity of FFF status and alternative explanations

This section addresses two key empirical challenges. First, one might argue that FFF status is an endogenous choice influenced by the level of LMR. We tackle this concern in Section 4.1 by employing an instrumental variable (IV) regression, instrumenting for FFF status.

Table 5. Cross-sectional heterogeneity II: is it about risk?

Dependent variable	Cash		CashToNetAssets		Cash		CashToNetAssets	
Sample	FFF	Non-FFF	FFF	Non-FFF	FFF	Non-FFF	FFF	Non-FFF
Volatility variable	Sales				Cash flow			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LMR	0.004 (1.67)	–0.002 (−0.97)	–0.001 (−0.11)	–0.007 (−1.24)	0.005** (2.16)	–0.002 (−1.08)	–0.000 (−0.04)	–0.008 (−1.34)
LMR#volatility	0.015*** (5.37)	–0.006*** (−5.77)	0.042*** (6.30)	–0.018*** (−4.91)	0.040*** (5.80)	–0.010*** (−2.95)	0.157*** (6.30)	–0.031*** (−3.50)
Volatility	–0.058*** (−5.31)	0.031*** (9.43)	–0.140*** (−4.55)	0.093*** (7.97)	–0.142*** (−4.14)	0.057** (2.88)	–0.584*** (−3.06)	0.183*** (3.35)
$Size_{(t-1)}$	0.005 (0.82)	–0.029*** (−5.59)	0.045* (1.84)	–0.057** (−2.44)	0.005 (0.83)	–0.030*** (−5.57)	0.044 (1.58)	–0.061** (−2.43)
$Growth_{(t-1)}$	–0.003 (−1.13)	0.005*** (4.67)	–0.016 (−1.32)	0.026*** (4.07)	–0.003 (−1.13)	0.005*** (4.77)	–0.017 (−1.27)	0.026*** (3.96)
$Leverage_{(t-1)}$	–0.107*** (−4.91)	–0.079*** (−10.31)	–0.267*** (−3.22)	–0.195*** (−4.69)	–0.104*** (−4.84)	–0.081*** (−9.94)	–0.259*** (−3.09)	–0.202*** (−4.70)
$NWC_{(t-1)}$	–0.047* (−2.07)	–0.038* (−1.80)	–0.125** (−2.14)	–0.133* (−2.05)	–0.048* (−2.03)	–0.040* (−1.91)	–0.135* (−2.11)	–0.140** (−2.14)
$Investments_{(t-1)}$	–0.062** (−2.28)	–0.049*** (−3.07)	–0.209** (−2.63)	–0.099* (−1.99)	–0.059** (−2.28)	–0.049*** (−3.00)	–0.201** (−2.61)	–0.100* (−1.97)
$Dividends_{(t-1)}$	0.003 (0.74)	0.007*** (3.39)	0.000 (0.05)	0.013** (2.31)	0.003 (0.97)	0.007*** (3.21)	0.001 (0.18)	0.013** (2.23)
$Cash\ flow_{(t-1)}$	0.035* (1.84)	0.008 (0.75)	0.100 (1.44)	–0.025 (−0.56)	0.047** (2.26)	0.007 (0.63)	0.131 (1.70)	–0.027 (−0.62)
Other ultimate owner		0.002 (0.54)		0.008 (0.70)		0.002 (0.46)		0.008 (0.66)
$Inflation_{(t-1)}$	–0.213 (−0.84)	–0.090 (−1.07)	–0.053 (−0.07)	0.059 (0.20)	–0.250 (−0.95)	–0.093 (−1.09)	–0.165 (−0.21)	0.050 (0.17)
$GDP\ growth_{(t-1)}$	–0.030 (−0.42)	–0.042 (−1.01)	0.059 (0.15)	–0.103 (−0.68)	–0.044 (−0.58)	–0.045 (−1.08)	0.024 (0.06)	–0.111 (−0.75)
$ln(GDP\ p.c.)_{(t-1)}$	0.050 (0.81)	0.087*** (3.15)	–0.003 (−0.01)	0.067 (0.64)	0.057 (0.89)	0.088*** (3.20)	0.023 (0.08)	0.067 (0.66)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level	Country-level	Country-level	Country-level	Country-level
Observations	6,085	21,248	6,085	21,248	6,050	21,158	6,050	21,158
R^2_{adj}	0.110	0.072	0.088	0.053	0.110	0.071	0.090	0.052

Note(s): This table presents the results of OLS regression of firm risk-related differential effect of LMR on cash holdings for subsamples based on the FFF status. We measure firm risk in terms of sales volatility (Columns 1–4) and cash flow volatility (Columns 5–8). We calculate sales (cash flow) volatility as the standard deviation of sales (cash flow), deflated by total assets, in the previous five years, with at least three out of five available firm-year-observations. Column 1 and 2, 5 and 6 (3 and 4, 7 and 8) show the results for Cash (CashToNetAssets) as dependent variable. All variables are defined in Table A1 in the Appendix. All independent variables except LMR, Volatility, and Other Ultimate Owner are lagged by one period. All regression specifications include firm fixed effects, industry-year fixed effects, and country specific year trends. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 6. Economic significance of results

Dependent variable	Cash	CashTo NetAssets	Cash	CashTo NetAssets	Cash	CashTo NetAssets
Sample	All		Labor-intense firms		Domestic firms	
Economic significance			Elasticity: dy/dx × (Ø[x]/Ø[y])			
	(1)	(2)	(3)	(4)	(5)	(6)
LMR	–0.110	–0.257	–0.202	–0.560	–0.388	–0.743
LMR#FFF	0.193	0.386	0.404	0.802	0.543	1.148
LMR + LMR#FFF	0.083	0.129	0.202	0.243	0.155	0.405
FFF	–0.041	–0.078	–0.090	–0.191	–0.140	–0.341
$Size_{(t-1)}$	–2.156	–2.214	–2.126	–3.035	–2.249	–1.644
$Growth_{(t-1)}$	0.052	0.121	0.042	0.063	0.060	0.207
$Leverage_{(t-1)}$	–0.125	–0.180	–0.125	–0.137	–0.140	–0.197
$NWC_{(t-1)}$	–0.006	–0.012	–0.005	–0.007	–0.003	–0.007
$Investments_{(t-1)}$	–0.031	–0.048	–0.032	–0.051	–0.033	–0.024
$Dividends_{(t-1)}$	0.021	0.022	0.014	0.015	0.017	–0.002
Cash $flow_{(t-1)}$	0.003	0.002	0.001	0.004	0.003	0.003
Cash flow $volatility_{(t-1)}$	0.006	0.014	–0.001	0.005	0.007	0.016
Other ultimate owner	0.002	0.008	0.011	0.014	–0.006	–0.013
$Inflation_{(t-1)}$	–0.008	0.005	–0.009	–0.009	0.012	0.041
GDP $growth_{(t-1)}$	–0.003	–0.001	–0.001	–0.003	–0.001	–0.003
ln(GDP $p.c.)_{(t-1)}$	6.285	2.978	5.175	13.163	0.694	0.761
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level	Country-level	Country-level
Observations	28,113	28,113	12,098	12,098	7,027	7,027

Note(s): This table reports the economic significance of FFF-related differential effect of LMR on cash holdings based on regression coefficients from Tables 3 and 4 and summary statistics in Table 1, Panel A, B, and C. Economic significance is assessed in terms of elasticity of cash holdings (y) towards each independent variable (x). Column 1 (2) show the results for Cash (CashToNetAssets) for the whole sample, column 3 (4) for the subsample of labor-intensive firms, and column 5 (6) for the subsample of domestic firms. All variables are defined in Table A1 in the Appendix

Second, FFFs and non-FFFs may systematically differ, raising the possibility that our findings reflect underlying heterogeneity rather than a true causal relationship. To address this, we apply propensity score matching (PSM) in Section 4.2- and conduct a series of horserace regressions in Section 4.3.

4.1 Instrumental variable approach

A family's decision to maintain or dilute its ownership–and thus the FFF status of the firm–may depend on its financial policy and associated constraints, as well as LMR and other aspects of the contracting environment. Families' decision to maintain or to dilute their ownership and thus the FFF status might be a function of LMR, firms' financial policy, financial constraints and other characteristics of firm's contracting environment. As such, one might argue that the observed pattern may suffer from reverse causality and self-selection issues. While we cannot completely rule out these concerns, we try to mitigate them by using a two-stage least square instrumental variable approach.

To instrument the FFF status, we consider three country-level variables [18]. *First*, we follow Bennedsen *et al.* (2019) and use respondents' assessments of the strength of family values in a particular country from the World Value Survey, based on the argument that high family values are associated with a higher probability to maintain family ownership. We define the measure of family value as the mean response on the country-year level using data from the year that is closest to the beginning of our sample (2007) [19]. We construct a dummy variable (*High Family Value*) equal to one if the mean response in a particular country is above the median value of the sample. *Second*, we consider the country score on the individualism dimension of Hofstede's model of national culture (*Individualism*). We expect that family firms are more common in countries with low individualism scores, indicating that individuals prefer to be part of strongly tied groups that shape their preferences and interests (Hofstede, 2001). *Finally*, we use the country-level data on inheritance law from Ellul *et al.* (2010) as a measure of legal context that is evident to impact family decisions on intergenerational transfer (see Ellul *et al.*, 2010). We construct the *Inheritance Law Permissiveness* variable as specified in Section.

Table 7 reports results of the first-stage estimation of the FFF dummy in Column 1 and the estimation of the interaction of FFF dummy and LMR index in Column 2. As instruments, we use country-level variables, as described above, and interaction terms of each of these variables with LMR. The first and second stages also include all other control variables that enter Model (1), except country-specific year trend and firm fixed effects since our instruments are on the country level and time-invariant. As predicted, the FFF status is positively correlated with *High Family Value* and *Inheritance Law Permissiveness* negatively correlated with *Individualism*. Columns 3 and 4 of Table 7 show results on the second-stage estimation for *Cash* and *CashToNetAssets* respectively. For both definitions of cash holdings, our results continue to provide strong evidence of the negative relationship between changes in LMR and cash holdings in non-FFFs and a positive one in FFFs. As expected, the magnitude of the coefficients of interests in the second stage is higher than that reported in Table 3, while the significance remains largely unchanged. Further, the first-stage Kleibergen-Paap Wald F-tests and second-stage Hansen's J test suggest that the relevance and exogeneity conditions are verified for our instruments.

Overall, we conclude that our baseline results are robust to concerns related to the endogeneity of the FFF status.

4.2 Matching

The literature documents that family firms differ from non-family firms, for example regarding size (e.g., Anderson and Reeb, 2003), leverage (e.g., Schmid, 2013), investments

Table 7. Endogeneity of founding family firms – instrumental variable approach

	First stage		Second stage	
Dependent variable	FFF	FFF#LMR	Cash	CashTo NetAssets
	(1)	(2)	(3)	(4)
High family values	0.081 (1.13)	0.511 (1.31)		
High family values#LMR	–0.034** (−1.99)	–0.200** (−2.09)		
Individualism	–0.028*** (−3.36)	–0.116*** (−2.86)		
Individualism#LMR	0.006*** (3.46)	0.025*** (2.90)		
Inheritance law permissiveness	1.024* (1.90)	4.632* (1.74)		
Inheritance law permissiveness#LMR	–0.465*** (−3.13)	–2.083*** (−2.83)		
LMR	–0.100* (−1.77)	–0.108 (−0.39)	–0.035** (−2.07)	–0.106** (−2.25)
LMR#FFF			0.202** (2.05)	0.566** (2.06)
FFF			–0.703* (−1.73)	–1.964* (−1.75)
$Size_{(t-1)}$	–0.033*** (−5.98)	–0.135*** (−4.27)	–0.002 (−0.61)	–0.003 (−0.33)
$Growth_{(t-1)}$	–0.002 (−1.09)	–0.016* (−1.84)	0.020*** (11.01)	0.059*** (9.25)
$Leverage_{(t-1)}$	0.106*** (3.12)	0.453*** (2.80)	–0.309*** (−18.23)	–0.722*** (−12.80)
$NWC_{(t-1)}$	0.078*** (3.21)	0.377*** (3.26)	–0.102*** (−6.02)	–0.281*** (−5.60)
$Investments_{(t-1)}$	–0.060 (−1.07)	–0.227 (−0.96)	0.049 (1.39)	0.296** (2.53)
$Dividends_{(t-1)}$	0.078*** (2.61)	0.323** (2.01)	–0.020** (−2.31)	–0.088*** (−3.30)
$Cash\ flow_{(t-1)}$	0.187*** (3.33)	0.742** (2.29)	–0.146*** (−6.03)	–0.697*** (−7.15)
$Cash\ flow\ volatility_{(t-1)}$	–0.012 (−0.51)	–0.020 (−0.17)	0.035*** (3.00)	0.096*** (2.69)
Other ultimate owner	–0.370*** (−4.82)	–1.639*** (−3.85)	0.062*** (2.59)	0.185*** (2.76)
$Inflation_{(t-1)}$	–1.672 (−1.60)	–9.960* (−1.91)	0.137 (0.45)	1.592** (2.00)
$GDP\ growth_{(t-1)}$	–0.521 (−1.58)	–2.969* (−1.72)	0.137 (1.17)	0.434 (1.20)
$\ln(GDP\ p.c.)_{(t-1)}$	–0.280*** (−6.37)	–1.237*** (−5.83)	0.059*** (2.67)	0.149** (2.42)
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level
Observations	27,834	27,834	27,834	27,834
Kleibergen-Paap rk wald F			3.111	3.111
p-value of hansen J test			0.134	0.169

Note(s): This table presents the results of instrumental variable regressions for cash holdings. We instrument both FFF dummy and LMR#FFF. Columns 1 and 2 show the result of first-stage regressions. The instruments are High Family Values, Individualism, and Inheritance Law Permissiveness and interaction term of each instrument with LMR. Columns 3 and 4 show the result of second-stage regression for Cash and CashtoNetAssets respectively. All independent variables except LMR, FFF, Other Ultimate Owner, and instruments are lagged by one period. All variables are defined in Table A1 in the Appendix. All regression specifications include industry-year fixed effects. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

(Anderson *et al.*, 2012) or age (e.g., Franks *et al.*, 2012). Hence, one could argue that the presented results are simply driven by heterogeneous firm characteristics and not, as assumed, by a differing set of incentives specific to FFFs. Examining this concern, we form a matched sample by assigning non-FFFs with similar firm characteristics as a control group to the FFF observations, by using a propensity score matching (PSM) approach to minimize possible heterogeneity between these two groups.

We match non-FFF observations to FFF-observations within country [20] and industry [21] by a set of firm-level matching variables using nearest neighbor matching without replacement [22]. The matching variable firm size, investments, and leverage following Bennedsen *et al.* (2019), and firm age, as an additional discriminant factor that has been discussed in the literature (e.g., Franks *et al.*, 2012).

Table 8 presents the results of the PSM approach without (Columns 1 and 3) and with a caliper restriction of $\delta = 0.0001$ (Columns 2 and 4) for *Cash* and *CashToNetAssets* as dependent variables. Showing quantitatively and qualitatively similar results in all specifications, our main findings appear to be robust against the concern of firm specific heterogeneity between FFFs and non-FFFs.

4.3 Firm-level alternative explanations

One might argue that our results could be explained by two alternative explanations on firm-level. *First*, one could argue that high-tech firms and financially constrained firms have a higher need for financial flexibility and thus might increase their cash holdings as a response to tightening LMR (e.g., Karpuz *et al.*, 2020; Schmalz, 2016). At the same time, high-tech status and financial constraints might arguably correlate with FFF status. We address this concern by running a number of horse race regressions, where we add additional variables interacted with FFF status to Model (1). Results of this exercise are reported in Table 9.

In Panel A, we identify high-tech firms as firms operating in industries with high R&D expenses and high proportion of intangible assets. Specifically, we calculate country-specific median values per industry for R&D to lagged sales (intangible assets to lagged sales) and characterize firms as high-tech in case they are affiliated to an industry in the upper quartile (for a similar approach see Klasa *et al.*, 2009) [23]. The results in Panel A of Table 9 remain consistent with our predictions for both, FFFs and non-FFFs, and suggest that our findings are not driven by the prevelance of high-tech firms.

In Panel B, we employ a number of financial constraints measures, as described in the literature:

- a Size Dummy;
- a firm Age Dummy following the findings of Hadlock and Pierce (2010) that size and age serve as fairly reliable proxies for financial constraints;
- a Dividend Payer Dummy (Schmalz, 2016);
- the Whited and Wu (WW) Index (Whited and Wu, 2006); and the
- Kaplan and Zingales (KZ) Index (Kaplan and Zingales, 1997; Lamont *et al.*, 2001)[24].

We again run a horse race regression controlling for the interaction term between *LMR* and a particular measure of financial constraints. The results in Panel B of Table 9 show that both, the coefficient of *LMR* itself and the coefficient of the interaction term between *FFF* and *LMR*, maintain the predicted signs and statistical significance throughout all specifications. Taken together, financial constraints seem not to provide an alternative explanation to our findings.

Table 8. Endogeneity of founding family firms – propensity score matching

	Cash		CashToNetAssets	
Dependent variable	(1)	(2)	(3)	(4)
LMR	–0.006** (−2.80)	–0.006** (−2.53)	–0.024** (−2.29)	–0.033*** (−4.84)
LMR#FFF	0.009*** (4.67)	0.010*** (11.73)	0.029*** (3.78)	0.034*** (9.79)
FFF	–0.035** (−2.19)	–0.034* (−1.87)	–0.136** (−2.86)	–0.154** (−2.97)
$Size_{(t-1)}$	–0.001 (−0.12)	–0.007 (−1.01)	0.029** (2.39)	0.023 (0.60)
$Growth_{(t-1)}$	0.002 (0.78)	0.003 (1.25)	0.008 (0.71)	0.013 (0.86)
$Leverage_{(t-1)}$	–0.095*** (−8.38)	–0.123*** (−5.82)	–0.226*** (−4.81)	–0.317*** (−6.00)
$NWC_{(t-1)}$	–0.061** (−2.37)	–0.067 (−1.42)	–0.169** (−2.49)	–0.194 (−1.52)
$Investments_{(t-1)}$	–0.063** (−2.75)	–0.048 (−1.69)	–0.192** (−2.72)	–0.175* (−2.05)
$Dividends_{(t-1)}$	0.006** (2.57)	0.004* (1.82)	0.007 (1.55)	0.001 (0.19)
$Cash\ flow_{(t-1)}$	0.035** (2.42)	0.023 (1.19)	0.063 (1.19)	0.038 (0.47)
$Cash\ flow\ volatility_{(t-1)}$	0.021*** (3.17)	0.015*** (3.30)	0.102** (2.28)	0.074** (2.40)
Other ultimate owner	–0.006 (−1.61)	–0.013 (−1.64)	–0.042** (−2.38)	–0.075*** (−3.58)
$Inflation_{(t-1)}$	–0.043 (−0.26)	–0.282 (−1.16)	0.593 (1.29)	1.204* (1.97)
$GDP\ growth_{(t-1)}$	–0.074 (−1.54)	–0.085 (−1.13)	–0.030 (−0.12)	0.014 (0.07)
$\ln(GDP\ p.c.)_{(t-1)}$	0.057* (1.79)	0.146** (2.90)	0.020 (0.17)	0.099 (1.17)
Caliper	No	0.0001	No	0.0001
Firm fixed effects	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level
Observations	12,426	6,996	12,426	6,996
R^2_{adj}	0.076	0.123	0.049	0.080

Note(s): This table presents the OLS regression results of the FFF-related differential effect of LMR on cash holdings using a propensity score matched sample. For each FFF observation non-FFF observations in the same country were matched (nearest neighbor matching, without replacement) using the Fama-French 30 industry classification and the firm level variables Size, Leverage, Investments and ln (1 + FirmAge). Column 1 (2) shows the results for Cash (CashToNetAssets) without a caliper restriction. Column 3 (4) shows the results for Cash (CashToNetAssets) using a caliper restriction of 0.0001. All variables are defined in Table A1 in the Appendix. All independent variables except LMR, FFF, and Other Ultimate Owner are lagged by one period. All regression specifications include firm fixed effects, industry-year fixed effects, and country specific year trends. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 9. Alternative explanations I: Firm characteristics

Dependent variable	Cash	CashTo NetAssets	Cash	CashTo NetAssets
Tech firm variable	R&D-Intensity		Intangible assets	
	(1)	(2)	(3)	(4)
Panel A: High-Tech firms				
LMR	–0.004** (−2.88)	–0.015*** (−4.00)	–0.004** (−2.46)	–0.016** (−2.73)
LMR#FFF	0.007*** (3.38)	0.024** (2.29)	0.008*** (3.53)	0.025** (2.50)
FFF	–0.027*** (−5.25)	–0.088*** (−3.92)	–0.028*** (−6.27)	–0.094*** (−4.64)
LMR# tech firm variable	–0.000 (−0.04)	–0.004 (−0.41)	–0.000 (−0.06)	–0.002 (−0.35)
Tech firm variable	0.000 (0.03)	0.019 (0.47)	–0.002 (−0.46)	–0.003 (−0.18)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level
Observations	28,113	28,113	28,067	28,067
R^2_{adj}	0.058	0.037	0.059	0.039

Dependent variable	Cash				
Financial constraint variable	Size	Age	Dividend payer	WW-Index	KZ-Index
	(1)	(2)	(3)	(4)	(5)
Panel B: Financial constraints					
LMR	–0.004** (−2.45)	–0.004** (−2.29)	–0.005** (−2.83)	–0.013*** (−3.76)	–0.005** (−2.58)
LMR#FFF	0.007*** (3.42)	0.008*** (3.42)	0.007*** (3.31)	0.008*** (3.26)	0.006*** (3.04)
FFF	–0.027*** (−5.10)	–0.028*** (−5.59)	–0.027*** (−5.44)	–0.026*** (−4.00)	–0.013 (−1.43)
LMR# financial constraint variable	0.000 (0.16)	–0.002 (−0.50)	0.002 (1.12)	–0.015** (−2.80)	–0.000 (−1.66)
Financial constraint variable	0.002 (0.21)	0.015 (1.02)	–0.003 (−0.40)	0.060* (2.01)	–0.000 (−0.33)
Controls	Yes	Yes	Yes	Yes	Yes

(*continued*)

Table 9. Continued

Dependent variable			Cash		
Financial constraint variable	Size	Age	Dividend payer	WW-Index	KZ-Index
	(1)	(2)	(3)	(4)	(5)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level	Country-level
Observations	28,113	28,086	28,113	26,035	23,988
R^2_{adj}	0.058	0.058	0.058	0.059	0.072

Note(s): This table presents the results of OLS regressions accounting for alternative firm characteristics, explaining the main findings. In Panel A, the dependent variable is Cash (Columns 1 and 3) and CashToNetAssets (Columns 2 and 4). In Columns 1 and 2, regressions control for the interaction between LMR and R&D-intensive industries, where R&D-intensive industries are defined as median values for R&D expenses related to sales from the previous year for each industry from the 48-Fama-French industry classification in a particular country-year (note that main effect of R&D-intensive industries is included, but is omitted because of collinearity). In Columns 3 and 4, the regressions control for the main effect of intangible assets (Intangibility), defined as total intangible assets related to sales from the previous year and adjusted for median industry values, as well as the interaction between LMR and Intangibility. In Panel B, the dependent variable is Cash. The regressions control for the main effect and the interaction term between LMR and Size dummy in Column 1, Age dummy in Column 2, Dividend Payer Dummy in Column 3, Whited and Wu Index in Column 4, and Kaplan and Zingales measure of financial constraints in Column 5. All variables are defined in Table A1 in the Appendix. All independent variables except LMR, FFF, and Other Ultimate Owner are lagged by one period. All regression specifications include firm fixed effects, industry-year fixed effects, and country specific year trends. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

Second, one could argue that firms with a concentrated ownership structure tend to be more risk-averse due to their owners' limited diversification and may therefore increase cash holdings in response to tightening LMR. At the same time, FFF status is—by definition—correlated with concentrated ownership. We address this concern in Table 10.

Column (1) extends our baseline model by including an interaction between *LMR* and *Other Ultimate Owner*, so that the base effect of LMR refers to widely held firms. *Other Ultimate Owner* is a binary variable equal to one if a firm has a global ultimate owner who holds at least 25% of its voting rights and is not classified as a founding family firm. We find that while the coefficient on the interaction between *LMR* and the *FFF* dummy continues to be positive and significant, the coefficient on the interaction between *LMR* and *Other Ultimate Owner* shows a significant but negative sign. This result run against the general blockholder effect raised above [25]. Columns 2 and 3 estimate Model (1) on the

Table 10. Alternative explanations II: Ownership-related characteristics

Dependent variable		Cash		
Sample		Full	w/o widely held firms	
Specification	Coeff.	(1)	(2)	(3)
LMR	λ_1	–0.001 (−0.58)	–0.006* (−1.93)	–0.005 (−1.63)
LMR#FFF	λ_2	0.005** (2.19)	0.011*** (4.28)	0.010*** (4.23)
FFF		–0.020*** (−3.25)	–0.042** (−2.26)	–0.063 (−0.24)
LMR# other ultimate owner	λ_3	–0.005*** (−3.29)		
Other ultimate owner		0.020*** (2.98)		
Diff	H_0: $\lambda_1 = \lambda_1 + \lambda_2$	$p < 0.028$		
Diff	H_0: $\lambda_2 = \lambda_3$	$p < 0.000$		
Diff	H_0: $\lambda_1 + \lambda_2 = \lambda_1 + \lambda_3$	$p < 0.000$		
$Size_{(t-1)}$#FFF				0.007 (1.64)
$Growth_{(t-1)}$#FFF				–0.004 (−0.93)
$Leverage_{(t-1)}$#FFF				–0.016 (−0.77)
$NWC_{(t-1)}$#FFF				–0.001 (−0.03)
$Investments_{(t-1)}$#FFF				–0.022 (−1.05)
Dividend $dummy_{(t-1)}$#FFF				–0.003 (−0.75)
Cash $flow_{(t-1)}$#FFF				0.014 (0.71)
Cash flow $volatility_{(t-1)}$#FFF				0.046* (1.97)
$Inflation_{(t-1)}$#FFF				–0.103 (−0.81)
GDP $growth_{(t-1)}$#FFF				0.017 (0.39)
$\ln(\text{GDP p.c.})_{(t-1)}$#FFF				–0.004 (−0.17)
Controls		Yes	Yes	Yes
Firm fixed effects		Yes	Yes	Yes
Industry-Year fixed effects		Yes	Yes	Yes
Country specific year trend		Yes	Yes	Yes
Clustered standard errors		Country-level	Country-level	Country-level
Observations		28,113	15,185	15,185
R^2_{adj}		0.058	0.065	0.067

Note(s): This table presents the results of OLS regressions accounting for alternative ownership-related characteristics, explaining the main findings. Column 1 presents the results of OLS regression of FFF-related and other ultimate owner-related differential effect of LMR on cash holdings using widely held firms as reference group. Columns 2 and 3 show the FFF-related differential effect using other ultimate owner as reference group. The table also reports results of Wald-test for coefficients from Column 1. In all regression specifications, Cash is used as dependent variable. All variables are defined in Table A1 in the Appendix. All independent variables except LMR and all ownership-related variables are lagged by one period. All regression specifications include firm fixed effects, industry-year fixed effects, and country specific year trends. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

subsample of firms with an ultimate owner, i.e. we exclude widely held firms. To address the concern of distorting control variables we interact all controls with *FFF* status in Column 3. Again, we find no evidence for a general blockholder effect raised above.

Overall, while we cannot entirely rule out the possibility that alternative explanations may drive our findings, the results from Tables 10 and 11 help mitigate such concerns.

5. Sources of cash holdings increases

In this section, we examine the channels through which FFFs and non-FFFs adjust their cash holdings in response to variations in LMR. From the accounting perspective, changes in cash holdings are a result of changes in cash flows from operating, financing and investing activities (Karpuz *et al.*, 2020; Brisker *et al.*, 2013). We are particularly interested in the latter two, as we consider them to serve as channels through which cash holdings may be adjusted intentionally [26].

To investigate the role of the cash flow from financing (CFF) and the cash flow from investing (CFI) activities, we scale CFF (*CFF*) and CFI (*CFI*) by lagged total sales (Srinivasan and Thampy, 2017) and regress each measure on *LMR*, its interaction with *FFF*, a set of controls, and array of fixed effects as in Model (1). Columns 1 and 2 of Table 11 report the results. We find an insignificant coefficient for the interaction term in Column 1, suggesting that

Table 11. Sources of cash holding increases

Dependent variable	CFI (1)	CFF (2)	Debt issuance (3)	Dividends (4)
LMR	–0.005 (−0.53)	–0.034 (−1.34)	–0.021 (−1.10)	0.008** (2.17)
LMR#FFF	0.002 (0.22)	0.059** (2.17)	0.010** (2.27)	–0.016** (−2.77)
FFF	–0.034 (−0.59)	–0.376* (−1.81)	–0.021 (−0.88)	0.057** (2.72)
$Size_{(t-1)}$	–0.000 (−0.00)	–0.127*** (−3.31)	–0.016** (−2.80)	0.035*** (7.92)
$Growth_{(t-1)}$	0.020*** (3.44)	0.065*** (4.18)	0.014 (1.48)	0.004** (2.79)
$Tangibility_{(t-1)}$	–0.325 (−1.41)	–0.577* (−1.89)	0.054** (2.15)	–0.011 (−0.46)
$NWC_{(t-1)}$	0.187** (2.33)	0.033 (0.21)	–0.151*** (−3.19)	0.155*** (4.21)
$Cash_{(t-1)}$	0.962*** (3.66)	0.235 (0.62)	–0.176** (−2.70)	0.230*** (5.19)
Other ultimate owner	0.004 (0.44)	0.042 (1.61)	0.028 (1.40)	–0.000 (−0.03)
$Inflation_{(t-1)}$	–0.750** (−2.46)	–2.044*** (−2.96)	0.530 (1.31)	–0.568** (−2.90)
$GDP\ growth_{(t-1)}$	–0.163 (−1.34)	–0.257 (−0.63)	0.092 (0.47)	0.671*** (5.36)
$\ln(GDP\ p.c.)_{(t-1)}$	0.322** (2.52)	1.539** (2.61)	0.069 (0.47)	–0.388*** (−3.47)
Firm fixed effects	Yes	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Country specific year trend	Yes	Yes	Yes	Yes
Clustered standard errors	Country-level	Country-level	Country-level	Country-level
Observations	27,918	27,856	24,320	26,628
R^2_{adj}	0.084	0.051	0.027	0.063

Note(s): This table presents the results of OLS regressions of mechanisms behind the increases in cash holdings in family firms, compared to non-family firms. The analyses are conducted using interaction terms between labor market regulations and family firms (LMR#FFF). The dependent variables are Cash Flow from Investment Activities divided by Total Sales ($t-1$) (Column 1), Cash Flow from Financing Activities divided by Total Sales ($t-1$) (Column 2), Long Term Debt Issuance divided by Total Assets ($t-1$) (Column 3), and Dividend Payout divided by EBIT ($t-1$) (Column 4). All variables are defined in Table A1 in the Appendix. All independent variables except LMR, FFF, and Other Ultimate Owner are lagged by one period. All regression specifications include firm fixed effects, industry-year fixed effects, and country specific year trends. The *t*-Statistics in parentheses are based on robust standard errors, clustered at the country level. *, **, *** denote statistical significance at the 10, 5, and 1% levels, respectively

FFF response to variations in LMR does not differ significantly from the response of non-FFFs. However, we find a positive and statistically significant coefficient for the interaction term in Column 2, suggesting an FFF-specific response to variations in LMR for CFF.

This raises the question: how do FFFs adjust their cash flow from financing (CFF)? Columns 3 and 4 provide insights into this by examining proceeds from long-term debt issuance and dividend payouts. We define *Debt Issuance* as the issuance of long-term debt scaled by lagged total assets following Karpuz *et al.* (2020), and *Dividends* as total cash dividends relative to the previous period's operating profit (Jensen *et al.*, 1992; Aivazian *et al.*, 2006) [27].

Focusing on the coefficient of the interaction term between *FFF* and *LMR* the results are twofold. First, Column 3 suggests that FFFs, relative to other firms, increase debt issuance in response to stricter LMR. Second, Column 4 indicates that FFFs, again relative to other firms, reduce dividends when LMR tightens. Notably, Column 4 also shows that non-FFFs tend to increase dividend payouts in response to stricter LMR, which may explain their tendency to hold less cash following an increase in LMR.

6. Conclusion

The existing literature provides mixed evidence on the relationship between labor market frictions and firms' cash holding policies. In this paper, we propose that the impact of labor regulation on cash holding decisions is moderated by founding family firms (FFFs), a business type characterized by a unique incentive structure. Drawing on socioemotional wealth (SEW) arguments, we suggest that family firms shape their strategic and financial policies by evaluating whether their actions might jeopardize the firm's survival or their control over it (e.g., Gómez-Mejía *et al.*, 2007; Wiseman and Gómez-Mejía, 1998; Wiseman and Gómez-Mejía, 1998). Accordingly, we hypothesize that the relationship between labor market regulation (LMR) and cash holdings is relatively more positive for FFFs compared to other firms. Given that FFFs prioritize the intergenerational transfer of the firm and their long-term relationships with employees, they are more likely to pursue financial flexibility and adopt a risk-averse stance in response to pro-labor regulations. In contrast, non-FFFs, whose decisions are not shaped by generational concerns and instead focus on immediate wealth maximization, tend to prioritize rent extraction considerations when responding to stricter labor regulations.

Using a unique, partially hand-collected data set of listed FFFs and non-FFFs from 17 European countries during the 2007–2016 period, we find strong support for our hypothesis. Specifically, our results show that while non-FFFs reduce their cash holdings following increases in labor regulation, FFFs build cash buffers when faced with pro-labor regulations. The difference in responses is both statistically and economically significant, and robust across a series of robustness tests. As such, our results imply that:

- labor market frictions are an important determinant of firms' cash holding policies;
- FFFs and non-FFFs evaluate the costs and benefits of holding cash differently due to their distinct incentive structures, leading to significantly divergent responses in cash holding levels following changes in labor regulations; and
- the overall impact of labor market regulation on cash holdings depends, among other factors, on the proportion of family firms in the sample.

As such, our findings have important managerial and policy implications. First, our results suggest that managers, particularly CFOs, should take into account the preferences of influential owners when designing the firm's capital structure. Founding families with socioemotional wealth motives, for instance, may adopt a "better safe than sorry" approach,

favoring financial flexibility over (short-term) financial returns. Second, policymakers should anticipate that founding family firms might respond to softened labor market regulations by increasing payouts, which could have broader implications for labor and capital markets.

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Notes

[1.] As cash holdings represent "unconditional" liquidity that is also available in bad times (Lins *et al.*, 2010), an increasing cash buffer reduces firms' risk of financial distress and improves their financial flexibility (e.g., Beuselinck *et al.*, 2021; Cui *et al.*, 2018; Gamba and Triantis, 2008).

[2.] A notable exception is Kononova *et al.* (2019), which studies the moderating role of ownership concentration on the effect of labor market regulation on leverage.

[3.] It is important to carefully track the annual FFF status, as some 11.25% of our FFFs change their status to non-FFF during our 10-year sample period.

[4.] They are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.

[5.] We discard firm-year data if the increase or decrease in sales growth is more than 60% compared to the previous year (for a similar approach see e.g. Banker *et al.*, 2013; Frank and Goyal, 2003).

[6.] Due to perceived problems regarding the coverage and quality of the data before 2007, our sample starts in 2007.

[7.] One issue that we observe with the GUO variable is that in some cases OSIRIS does not aggregate the family holdings in year t, but shows the holdings of each person within the family as single shareholder, even if the holdings are aggregated in year $t-1$ or $t+1$. To avoid unjustified jumps in the family firm status over years and to assure consistency, we manually rechecked each identified family firm along its yearly observations.

[8.] The Economic Freedom of the World (EFW) index has been developed by James Gwartney, Robert Lawson, and Erik Gartzke and goes back to a series of conferences hosted by Michael Walker of the Fraser Institute and Nobel Laureate Milton Friedman (Gwartney *et al.*, 2005).

[9.] See also Hall and Lawson (2014) for a comprehensive overview of academic studies where the EFW index has been cited. Apart from labor economics studies, the EFW index is also used in finance literature (see e.g. Berger and Roman, 2017; Moeller and Schlingemann, 2005).

[10.] They are: hiring regulations and minimum wages; hiring and firing regulations; centralized collective bargaining; hour's regulations; mandated cost of worker dismissal; and conscription.

[11.] Some studies focus on the legislative provisions governing hiring and firing or dismissing of employees relying on e.g. the EPL index by OECD (Karpuz *et al.*, 2020; Simintzi *et al.*, 2015; Banker *et al.*, 2013), a measure constructed by Botero *et al.* (2004) (e.g., Alesina *et al.*, 2015) or considering a corresponding single legislative change in one country (Serfling, 2016). For example Alesina *et al.* (2015) also consider stringency of the minimum wages as a relevant labor market friction. A lot of studies investigate the relationship using data on trade unions (e.g., Shin *et al.*, 2018; Chino, 2016; Schmalz, 2016; Klasa *et al.*, 2009). Yet, e.g., Matsa (2010) proxies for the bargaining power of trade unions using the centralized collective bargaining.

[12.] Using a simple average to combine the components into a summary index, we follow the methodological approach of Gwartney *et al.* (2005).

[13.] We define low (high) LMR country-year observations as those observations that are smaller (larger) than the 10% (90%) quantiles of LMR, respectively.

[14.] In additional tests reported in the Online Appendix A, we re-estimated our Model (1) with alternative clustering of standard errors: robust standard errors (without clustering), clustering by industry, clustering by year, and clustering by industry-year. In all cases we find statistically significant positive coefficients for LMR#FFF FFF for both cash definitions, *Cash* and *CashToNetAssets*.

[15.] We apply a three-year threshold to maximize the number of observations and to make the sample comparable to the baseline sample. However, results remain unchanged if we use a threshold of five consecutive years.

[16.] In contrast, for non-FFFs, as reported in Columns 2, 4, 6, and 8, the interaction terms show a negative and statistically significant coefficient, implying that non-FFFs being exposed to higher volatility, reduce cash holdings even stronger for rising LMR. This is in line with the prediction of Matsa (2010), that the combination of increasing labor power and operating uncertainty provide firms with the incentive to use their financial policy as strategic devise.

[17.] Panel B and C of Table 1 show summary statistics for labor-intensive and domestic firms, respectively. The distribution of variables in subsamples is comparable to those in the full sample.

[18.] Since firms in our sample can switch from FFF to non-FFF and all test specifications include firm fixed effects, in untabulated results we ensure that our results are not solely driven by this variation in the *FFF* dummy, by re-estimating our main specification excluding FFFs switching their status. The results remain qualitatively and quantitatively similar.

[19.] Family Values is based on question a001 of the World Value Survey.

[20.] Given that the quality of matches depends on the number of potential matching partners, Luxembourg with only 27 observations is excluded from the analysis.

[21.] Using the Fama & French 30 industry definition enables us to trade-off the number of matched pairs.

[22.] Given that the nearest neighbor might still be far away, we further control for the distance of propensity scores between matched pairs and conduct PSM with a fairly conservative caliper restriction of $\delta = 0.0001$ reducing the resulting matched sample to 6.996 observations. The results remain qualitatively and quantitatively similar when using a less conservative caliper of 0.001 or 0.01 (see, e.g. Simintzi *et al.*, 2015).

[23.] Additionally, we consult proxies for high-tech firms based on the taxonomy of Kile and Phillips (2009) as well as Galindo-Rueda and Verger (2016). Analogously we generate dummy

variables, equal to one for high-tech industries, and zero otherwise. Showing qualitatively similar results, for brevity, we just report the results for R&D-Intensity and Intangibility.

[24.] For space reasons, for all tests going forward we only report the results using *Cash* as dependent variables. Our results remain qualitatively similar using the *CashToNetAssets* measure.

[25.] To confirm the robustness of these results, we conduct a Wald-test for equality of coefficients on the effect of widely held firms, founding family firms and firms with other blockholders. The p-values associated with these tests show significant differences at the conventional level.

[26.] We do not expect any intentionally changes in cash flows from operations and indeed in untabulated results, we do not find any empirical evidence for this channel in our sample.

[27.] To eliminate the effect of outliers, we replace the dividend ratio higher than one by one and exclude firms with negative operating profit that pay dividends (see Chay and Suh, 2009).

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Appendix

Table A1. Definition of variables

Variables	Definition
Panel A: Firm level variables	
Family firm dummy (FFF)	An indicator variable that equals one if an individual or a family owns at least 25% of a firm's voting rights and is related by blood or marriage to the founder of the company
Other ultimate owner	An indicator variable that equals one if the firm has an global ultimate owner owns that owns at least 25% of a firm's voting rights, and the firm is not classified as founding family firm
Cash	Cash and short-term investments divided by the book value of total assets
CashToNetAssets	Cash and short-term investments divided by the book value of total assets net of cash and short-term investments
Ln(CashToNetAssets)	The natural logarithm of one plus the ratio of CashToNetAssets
$Cash^{Net\ of\ Debt}$	Cash and short-term investments net of long-term debt divided by the book value of total assets
Size	The natural logarithm of the book value of total assets
Growth	The market-to-book ratio, defined as the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets
Leverage	Book value of total debt divided by the book value of total assets
NWC	Working capital net of cash divided by the book value of total assets
Investment	The sum of capital expenditures, acquisitions, and R&D expenditures divided by the book value of total assets
Dividends	An indicator variable that equals one if a firm pays cash dividends in a particular year, and zero otherwise
Cash flow	Earnings after interests, dividends, and taxes but before depreciation divided by the book value of total assets
Variables	Definition
Cash flow volatility	The standard deviation of industry cash flow calculated as follows: the firm–year standard deviation of cash flow for the previous five years (minimum three years). industry cash flow volatility is then calculated as the average of the firm cash flow standard deviations for each country-industry in each year, classified by 48 Fama-French industries
Panel B: Country level controls	
LMR	The arithmetic mean of the ratings of four Sub indicators of the economic freedom of the world (EFW) index by the fraser institute: hiring regulations and minimum wages, hiring and firing regulations, centralized collective bargaining, and mandated cost of worker dismissal. The indicators are normalized to range from 0 to 10. The index is defined as ten minus the aggregate index
ΔLMR^{LC}	A continuous variable that equals to the changes in LMR if the change is greater than the mean of absolute LMR changes in the sample (0.2 units), and zero otherwise
LMR^{LC-1}	A categorical variable that is based on changes in LMR that are greater than the mean of absolute LMR changes in the sample (0.2 units). the variable is defined recursively starting in 2007 (sample beginning) and distinguish between changes that increased (+ 1) and those that decreased (−1) employment protection

(*continued*)

Table A1. Continued

Variables	Definition
Inflation	The annual inflation rate
GDP growth	The real annual growth rate in gross domestic product
ln(GDP pc.)	The natural logarithm of gross domestic product in constant 2010U.S. dollars divided by total population
Panel C: Additional variables	
Labor intensive firms	An indicator variable that equals one if a firm's labor intensity is above the median of the labor intensity in the affiliate industry (48-Fama French industry classification) in a particular year, and zero otherwise. The labor intensity for each firm is calculated as the number of employees divided by total assets
Domestic firms	An indicator variable that equals one if a firm does not report any foreign assets in the previous three years. Ratio of local assets is computed as total assets minus international assets divided by total assets
Sales volatility	The firm–year standard deviation of sales to total assets calculated for the previous five years. In case that fewer than five years of lagged data are available, the standard deviation is calculated over all available years, but is set to missing if fewer than 3 years are available
Cash flow volatility	The firm–year standard deviation of cash flow to total assets calculated for the previous five years. In case that fewer than five years of lagged data are available, the standard deviation is calculated over all available years, but is set to missing if fewer than 3 years are available
Inheritance law permissiveness	The average of five indicators of the permissiveness of inherence law that differ depending on the surviving of spouse and the total number of children (Ellul *et al.*, 2010)
Gini coefficient	Gini coefficient from OECD
Corporate tax	Corporate tax rate from OECD
Unionization	Natural logarithm of the trade union density rate from OECD
Business confidence	Yearly growth of the business confidence indicator from OECD
Macro-Economic uncertainty	One year ahead macroeconomic uncertainty index of Rossi and Sekhposyan (2015)
Crisis dummy	An indicator variable that equals one for the years 2008 and 2009 and zero otherwise
Age	Natural logarithm of (1 + age). age is based on founding year, hand-collected or from Thomson Reuters
R&D-Intensity	An indicator variable that equals to one if industry-year median values for R&D expenses to sales from the previous year belong to the upper quartile and zero otherwise
Intangible assets	Intangible capital to sales from the previous year, adjusted for median industry values in a particular country-year
Size dummy	An indicator variable equal to one for firms that are smaller (in terms of total assets) than the sample median and zero otherwise, following (Schmalz, 2016)
Age dummy	An indicator variable, based on founding year, hand-collected or from thomson reuters, equal to one for firms that are younger than 15 years (following Karpuz *et al.* (2020)) and zero otherwise

(*continued*)

Table A1. Continued

Variables	Definition
Dividend payer dummy	An indicator variable equal to one for firms that do not pay dividends in a particular year and zero otherwise
Whited and Wu index	Whited and Wu index of financial constraints following Whited and Wu (2006)
Kaplan and zingales index	Kaplan and zingales index of financial constraints following Kaplan and Zingales (1997) and Lamont *et al.* (2001)
CFF	Net cash flow from financing activities to sales from the previous year
CFI	Net cash flow from investing activities to sales from the previous year
Debt issuance	Cash inflows from the issuance of long-term debt to the total assets from previous year
Dividends	Total cash dividends to operating profit of the previous period. The dividend ratio higher than one is replaced with one. Firm-observations with negative operating profit but positive cash dividends are excluded

Note(s): This table presents variable definitions on a firm level (Panel A), country level (Panel B) and for additional variables (Panel C)

Supplementary material
The supplementary material for this article can be found online.

Corresponding author
Marc Steffen Rapp can be contacted at: msr@m-s-rapp.de