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Unemployment insurance and cash holdings of privately-held firms around the world

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ABSTRACT

Research Question/Issue: This paper studies the relationship between country-level unemployment insurance and cash holdings of privately-held firms. When public unemployment insurance is weak, firms may provide alternative unemployment insurance by committing not to lay off workers in bad times. We hypothesize that one way firms can do so is by holding larger cash balances.

Research Findings/Insights: Using a large sample covering 388,940 private firms from 32 countries around the world over the 2007-2014 period, we find a negative relationship between public unemployment insurance and cash holdings. This effect is driven by countries where public unemployment insurance is weak or non-existent. We also find that privately-held firms keep a larger part of their new debt issues as cash when public unemployment insurance is weak.

Theoretical/Academic Implications: We contribute to a growing literature on an institution-based view of comparative corporate governance. We show that national governance factors and, more specifically, public unemployment insurance, which protects employees (an important but relatively ignored stakeholder), influences firm cash holdings in a private firm context.

Practitioner/Policy Implications: Our findings have important implications for policy design. Specifically, they suggest that labor market institutions designed to support employees can also indirectly benefit their employers because these institutions allow firms to reduce the opportunity cost related to holding larger cash balances.

Keywords: privately-held firms, cash holdings, unemployment risk, public unemployment insurance

JEL classification codes: G32, G38, J83

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1. INTRODUCTION

Firms across the world hold considerable amounts of cash (Dittmar, Mahrt-Smith & Servaes, 2003). However, significant cash holdings increase managerial discretion, which raises concerns about agency problems (Kalcheva & Lins, 2007). For instance, managers may use cash to invest in "pet projects" that benefit themselves but do not create value for shareholders (Shleifer & Vishny, 1997). Moreover, cash holdings are subject to a high opportunity cost because they yield low returns (Opler, Pinkowitz, Williamson & Stulz, 1999). Consequently, a large literature has emerged to increase our understanding of the firm-, industry- and country-level factors that explain why firms hold significant cash balances (e.g., Chen, 2008; Dittmar & Mahrt-Smith, 2007; Dittmar, Mahrt-Smith & Servaes, 2003; Frésard & Salva, 2010; Harford, Mansi & Maxwell, 2008; Kalcheva & Lins, 2007; Kusnadi & Wei, 2011; Lins, Servaes & Tufano, 2010; Liu, Luo & Tian, 2015; McLean, 2011; Opler, Pinkowitz, Williamson & Stulz, 1999; Ozkan & Ozkan, 2004; Pinkowitz, Stulz & Williamson, 2003, 2006). However, this influential literature is characterized by some remarkable gaps that we address in this study.

First, while privately-held firms are the dominant organizational form across the world, empirical evidence on cash holdings of private firms remains scarce. Still, privately-held firms differ from their public counterparts in some fundamental ways (Brav, 2009). For instance, privately-held firms generally have lower manager-shareholder agency problems than public firms because managers and owners are often the same individuals (Fama & Jensen, 1983). Thus, private firm managers are less likely to overinvest at the expense of the owners, which explains why private firms have lower cash balances than public firms (Gao, Harford & Kai, 2013). However, because private firms are more constrained in accessing external capital markets, they have a higher precautionary demand for cash than public firms (Brav, 2009). It is further noteworthy that the dearth of research on cash holdings of private firms usually comes from single-country studies (Bigelli & Sánchez-Vidal, 2011; Deloof, 2001; Gao, Harford &

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Kai, 2013; García-Teruel & Martínez-Solano, 2008; Martínez-Sola, Garcia-Teruel & Martinez-Sola, 2018; Orens & Reheul, 2013).[1] Importantly, however, one can observe some notable differences in the findings across studies.[2] Such differences suggest that we need more multi-country studies on cash holdings of private firms, such as ours, to establish the generalizability of findings from prior single-country studies.

Second, although differences in samples, time frames, and measures could explain some of the differences across single-country studies, an institutional economic perspective (North, 1990) indicates that differences in countries' national governance systems are also impactful (e.g., Cumming, Sapienza & Siegel, 2009; Cumming, Johan & Zhang, 2014). Consistent with this idea, extant research has started to examine how differences in countries' protection of stakeholders, including shareholders and creditors, influence firm cash holdings. However, insights on other key stakeholders, such as employees, are more limited. More recently, there is an emerging literature on the relationship between different dimensions of countries' labor protection institutions and cash holdings (e.g., Cui, John, Pang & Wu, 2018; Devos & Rahman, 2018; Klasa, Maxwell & Ortiz-Molina, 2009), but this literature focuses on publicly-traded firms. Despite this focus on public firms, employees' concerns about losing their job, which would bring them substantial costs (Agrawal & Matsa, 2013) may be particularly acute in privately-held firms. Indeed, private firms are regularly viewed as less legitimate employers by (prospective) employees relative to public firms (e.g., Vanacker & Forbes, 2016; Williamson, 2000; Williamson, Cable & Aldrich, 2002). Consequently, we need more insights on how a

[1] A notable exception is Hall, Mateus & Bezhentseva Mateus (2014), who focus on a geographically limited set of countries, namely Central and Eastern European countries.

[2] For instance, cash holdings are remarkably larger in the Belgian sample (12% of total assets) of Orens & Reheul (2013), compared to those in the Spanish sample (6.6% of total assets) of García-Teruel & Martínez-Solano (2008).

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country's labor protection institutions—particularly those that affect (prospective) employees' perceived risk of unemployment—relate to cash holdings in privately-held firms.

This paper addresses the abovementioned gaps by focusing on the relationship between countries' public unemployment insurance—a specific labor protection institution that reduces the risk of unemployment and the associated loss of wages and other benefits (Ellul, Pagano & Schivardi, 2016)—and private firm cash holdings around the world. To do so, we use a large sample covering 388,940 private firms from 32 countries over the period 2007-2014. There are several possibilities for firms to reduce (prospective) employees' perceptions of unemployment risk, which are expected to be particularly high in countries with weak public unemployment insurance. For instance, prior research on public firms focused on ownership structure (Ellul, Pagano & Schivardi, 2018) and leverage (Agrawal & Matsa, 2013). However, private firms generally have concentrated ownership. Moreover, while private firms could also reduce their leverage to minimize unemployment risk, debt is often a very crucial form of external financing for these firms (Brav, 2009).[3] Consistent with Devos & Rahman (2018), we focus on firm cash holdings, which could represent a credible firm-level insurance against employees' unemployment risk. They find that US public firms significantly decreased their cash holdings after increases in unemployment insurance benefits in US states between 1982 and 2010. Contrary to Devos & Rahman (2018), we investigate *cross-country* differences in unemployment insurance and how this affects *private* firm cash holdings.

We hypothesize that privately-held firms hold more cash in countries with weaker public unemployment insurance. Greater cash holdings reduce the likelihood that firms must fire employees during a period of internal or external turmoil. Accordingly, firms might hold more cash as an insurance to diminish (prospective) employees' perceptions of unemployment

[3] When private firms attract new debt, tight financial covenants can also reduce (prospective) employees' perceptions of unemployment risk. However, it represents a double-edged sword because fixed debt-related payments also increase bankruptcy risk.

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risk. Because this risk is particularly acute in countries with low public unemployment insurance, precautionary cash holdings are expected to be greater for firms in these countries. These extra cash holdings may benefit the firm in two ways. First, employees are willing to accept lower wages and benefits if the perceived unemployment risk is lower. Second, a lower unemployment risk facilitates the hiring of new employees (Brown & Matsa, 2016; Devos & Rahman, 2018). In addition, we hypothesize that the issuance of new debt, which is the main source of external finance for privately-held firms (Brav, 2009), results in larger cash balances in countries with weaker public unemployment insurance.

A potential problem with an empirically observed relation between public unemployment insurance and firm cash holdings is that this relation might be driven by other factors, which are correlated with public unemployment insurance and cash holdings. We address this problem in several ways. First, we include in all regressions firm characteristics that have been found to significantly affect cash holdings (e.g., Bigelli & Sánchez-Vidal, 2011; Gao, Harford & Kai, 2013; Opler, Pinkowitz, Williamson & Stulz, 1999). Second, we control for country characteristics that might be correlated with public unemployment insurance and could affect firm cash holdings. These country characteristics measure macro-economic conditions, the availability of private credit, legal creditor protection and the rule of law in the country where the firm is established. We also include two dimensions of labor protection that have been found to significantly affect cash holdings of publicly-traded firms: the degree of unionization (Klasa, Maxwell & Ortiz-Molina, 2009) and the degree of legal employment protection (Cui, John, Pang & Wu, 2018). Finally, we also include industry fixed effects and, where possible, country fixed effects.

After controlling for the abovementioned factors, we find a statistically and economically significant negative relation between public unemployment insurance and private firm cash holdings. Thus, privately-held firms hold more cash for unemployment

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insurance when countries have a weaker public unemployment insurance system. This negative relation is driven by countries where public unemployment insurance is weak or non-existent, which suggests that the value that firms derive from "insuring" their workers against unemployment by holding more cash disappears once a country provides a relatively generous public unemployment insurance system. We further find that the relationship between increases in leverage and cash holdings is stronger for privately-held firms in countries with weak public unemployment insurance, which suggests that in these countries the proceeds of debt issues are more likely to be used for unemployment insurance.

Our study contributes to the literature in two important ways. First, we provide evidence on the determinants of cash holdings in private firms using a unique worldwide sample. This sample allows us to establish the generalizability of findings from a limited set of previous single-country studies. Establishing the external validity of prior findings is an increasingly important issue in many academic fields (Bettis, Helfat & Shaver, 2016). Second, we also make a broader contribution to a growing literature on the institution-based view of comparative corporate governance (e.g., Aguilera, Talaulicar, Chung, Jimenez & Goel, 2015; Cumming, Johan & Zhang, 2014; van Essen, Strike, Carney & Sapp, 2015). Specifically, we provide first-time evidence on the relationship between government policy with respect to unemployment and private firm cash holdings.

Our findings suggest that labor market institutions designed to protect employees also benefit employers, by allowing private firms to reduce their investments in cash. In a recent paper, Fuest, Peichl & Siegloch. (2018) show that German firms shift a significant part of the cost of corporate tax increases towards their employees by decreasing their wages. Investigating the effect of 6,800 corporate tax increases in German municipalities on the wages paid by firms located in these municipalities, they find that employees bear about half of the total tax burden. We show that firms and employees not only share *costs* imposed by the

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government on firms (i.e. corporate taxes) but also share *benefits* granted by the government to employees (i.e. unemployment insurance).

The rest of the paper is organized as follows. In the next section, we develop our hypotheses. We then discuss the sample and variables in section 3. Regression results are discussed in section 4, and section 5 concludes.

2. HYPOTHESES

Large cash balances provide managers with significant discretion, which represents a double-edged sword (e.g., George, 2005). On the one hand, cash allows managers to invest in projects that destroy value for shareholders but benefit themselves (Jensen & Meckling, 1976). Moreover, cash investments have a high opportunity cost because they yield very low returns (Opler, Pinkowitz, Williamson & Stulz, 1999). On the other hand, large cash balances buffer firms against internal and external shocks (Duchin, 2010). An institutional economic perspective (North, 1990) indicates that differences in countries' institutions will affect managerial behavior. Regulatory institutions, in particular, "establish and enforce laws and policies that govern business activities" (Holmes, Miller, Hitt & Salmador, 2003: 544). These institutions may provide protection to different firm stakeholders, affect managers' discretion to take specific actions, and thereby influence firm behavior, including its financial policies. This idea is well established in the influential law and finance literature (e.g., La Porta, Lopez-de-Silanes, Shleifer & Vishny, 1997).

Extant research has almost exclusively focused on the role of shareholder and creditor protection laws on firms' financial policies, including their cash holdings (e.g., Dittmar, Mahrt-Smith & Servaes, 2003; Kalcheva & Lins, 2007; Kusnadi & Wei, 2011). However, other important firm stakeholders, such as employees, have received more limited attention. Still, a growing literature is developing on how employees affect firms' financial policies, including their cash holdings (e.g., Cui, John, Pang & Wu, 2018; Devos & Rahman, 2018; Klasa,

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Maxwell & Ortiz-Molina, 2009).[4] Unfortunately, as highlighted before, this literature focuses exclusively on publicly-traded firms.

It is remarkable that so little research has focused on cross-country differences in cash holdings of privately-held firms and that we lack evidence altogether on how employees affect cash holdings in these firms. Cash holdings may be particularly crucial in private firms because these firms lack access to (and are often unwilling to access) external capital markets (Brav, 2009). While managers in publicly-traded firms can usually smooth their activities and invest when appropriate by accessing public markets, managers in privately-held firms have to rely more on cash holdings to do so (Brav, 2009). Still, privately-held firms often have fewer manager-shareholder agency problems than publicly-traded firms because they typically have concentrated ownership. This situation reduces the ability of private firm managers to overinvest at the expense of the owners and hence reduces their incentive to keep high cash reserves. Consistent with this agency argument, Gao, Harford & Kai (2013) find that public firms in the US tend to hold more cash than private firms, despite a higher precautionary demand for cash by private firms.

Employees are also key stakeholders in privately-held firms and these firms are major employers in most economies around the world. Importantly, when employees contribute their scarce human resources to firms, they face the risk of losing their job, which would bring them substantial costs (see Agrawal & Matsa, 2013, and Devos & Rahman, 2018, for an overview of the relevant literature). In many countries, employees are insured against layoffs by a public unemployment insurance system that reduces the risk of unemployment and the associated loss of wages and other benefits. However, when the public insurance system is weak or does not

[4] See also Bronars & Deere (1991), Chen, Chen & Wang (2015), Chino (2016), Huang (2017), Marciukaityte (2015) and Matsa (2010) for evidence that the power of unions affects debt policy, payout policy and CEO compensation and Ahmad, Beuselinck & Bollaert (2017), Dessaint, Golubov & Volpin (2017), Haw, Hu, Wu & Zhang (2018), Petry (2018), Serfling (2016) and Simintzi, Vig & Volpin (2015) for evidence that labor protection affects debt policy, payout policy, takeover activity and shareholder value.

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exist, firms may act as alternative providers of insurance against this risk (Ellul, Pagano & Schivardi, 2018). Firms may even have an advantage in providing employment insurance relative to governments. They are better positioned to detect opportunistic behavior of employees than market-based insurance providers, and they have a greater risk-bearing capacity than their employees. Firms may also have an incentive to provide unemployment insurance because it can reduce firms' labor costs if it leads the employees to accept lower wages and benefits (Ellul, Pagano & Schivardi, 2018). In addition, it may reduce the significant hiring costs that firms are often confronted with, as prospective employees have a tendency to shy away from less legitimate firms (e.g., Williamson, 2000).

Existing evidence from publicly-traded firms suggests that country-level unemployment insurance and firm-level insurance are substitutes. Specifically, Ellul, Pagano & Schivardi (2018) argue that public firms with long-term owners, who care more about their reputation, will find it easier to win the trust of their employees and are more credible in offering secure employment. This argument is confirmed by their finding that (listed) family firms, who typically have long-term ownership, provide unemployment insurance as a substitute for public unemployment insurance, but other firms do not. Thus, a firm's ownership structure can be a source of unemployment insurance. Moreover, Agrawal & Matsa (2013) show that higher unemployment benefits at the state level lead to increased leverage for a sample of US public firms. In other words, firms choose more conservative financial policies (i.e., lower leverage) partly to mitigate workers' exposure to unemployment risk.

Firms can also provide unemployment insurance to their employees by increasing their cash holdings. These increasing financial buffers reduce the likelihood that firms must fire employees in bad times (Devos & Rahman, 2018). Such cash buffers also reduce the risk of financial distress, which has been found to hamper the hiring of new employees (Brown & Matsa, 2016). Countries differ tremendously in the degree of public employment insurance

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they provide (e.g., Ellul, Pagano & Schivardi, 2018). For instance, in some countries, there is no such insurance (e.g., Colombia) or very limited insurance (e.g., UK), while in other countries (e.g., Portugal) the benefits employees receive in the first two years of unemployment equal more than 2/3 of their last gross wage. Moreover, the effect of public unemployment insurance systems on firm cash holdings is likely to be especially relevant for privately-held firms. Contrary to their publicly-traded counterparts, private firms are often viewed as less legitimate employers (e.g., Vanacker & Forbes, 2016; Williamson, 2000; Williamson, Cable & Aldrich, 2002). Consequently, privately-held firms are often confronted with significant challenges to draw the interest of prospective employees, hire new employees and retain them. In response to these challenges, privately-held firms may provide employment insurance by holding larger cash balances, particularly when these firms operate in countries with weak public unemployment insurance. Thus:

Hypothesis 1: In countries with weaker public unemployment insurance, privately-held firms will hold larger cash balances.

Devos & Rahman (2018) argue that cash holdings of public firms are public information used by media, analysts and other parties to generate forecasts and reports which are consumed by employees. However, these are typically expected to be less available for private firms. This raises the question how cash holdings shape perceptions of employees about unemployment risk in private firms. Since our analysis is based on publicly available financial statements, information on cash holdings is available to the employees. Furthermore, many firms have labor representatives via a works council and/or unions who play an important role in informing employees (e.g., Forth, Bryson & George, 2017; van den Berg, Grift, van Witteloostuijn, Boone & van der Brempt, 2013).

So far, we hypothesized on the impact of public unemployment insurance on the *level* of cash holdings for privately-held firms. We next consider the *change* in cash holdings.

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McLean & Zhao (2018) find that public firms with a high need for precautionary cash use equity issues to fund their cash holdings. However, the primary source of external finance for private firms is debt. Indeed, Brav (2009) shows that compared to their public counterparts, privately-held firms rely almost exclusively on debt, have higher leverage ratios, and tend to avoid external capital markets. The importance of debt is also confirmed for different types of private firms, ranging from young firms (Cassar, 2004; Deloof, La Rocca & Vanacker, 2019) to high-growth firms (Vanacker & Manigart, 2010). Hence, privately-held firms are expected to use debt instead of external equity to fund precautionary cash holdings. If private firms keep cash to secure employment, the issuance of new debt by these firms should result in more cash holdings in countries with a weaker public unemployment insurance system. Thus:

Hypothesis 2: In countries with weaker public unemployment insurance, the issuance of new debt by privately-held firms will result in larger cash balances.

3. DATA AND VARIABLES

3.1. Sample

We collected data on privately-held firms over the period of 2007-2014 using the March 2016 version of the Orbis database, compiled by Bureau van Dijk (a Moody's Analytics company). This database contains financial and administrative data on public and private firms worldwide. We first retrieved all private firms with a minimum of 2 million EUR revenues. This criterion is adopted to exclude micro-firms (revenue less than 2 million EUR according to the European Commission's definition), which often disclosure very limited financial information. Second, we excluded firms operating in financial industries (SIC 6000–6999), utilities (SIC 4800–4999), quasi-regulated industries (SIC 4000–4499) and public administration (SIC 9100-9729). Third, we discarded firms for which the ultimate owner is another firm, to ensure that our sample firms are not subsidiaries, which may have different incentives for holding cash (Beuselinck & Du, 2017). Following the Orbis classification, firms without an ultimate owner

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are defined as independent firms in which no single corporate shareholder holds more than 25.01 percent of the firms' shares. Finally, we excluded firms for which Orbis only has limited financial data and firms with missing industry (SIC) classification codes. Finally, we had to exclude firms from countries that were missing data on the study's key variables (e.g., public unemployment insurance). Our final sample consists of 1,679,907 firm-year observations representing 388,940 private firms from 32 countries around the world. All definitions and data sources for the variables used in our analysis are reported in Table 1.

3.2. Variables

3.2.1. Dependent variable

Following other studies on cash holdings (e.g., Opler, Pinkowitz, Williamson & Stulz, 1999; Dittmar, Mahrt-Smith & Servaes, 2003), we measure *cash holdings* by the natural log of cash and cash equivalents divided by net assets, i.e. total assets minus cash and cash equivalents. The data come from Orbis. In robustness tests, reported below, we also use alternative measures such as winsorized cash on net assets.

3.2.2. Independent variable

Following Ellul, Pagano & Schivardi (2018), we use the ratio of the average unemployment insurance benefits an employee receives in the first two years of unemployment, relative to the employee's last gross wage, as our measure of *public insurance* against unemployment. This measure was originally computed by Aleksynska & Schindler (2011), based on the information from various sources including the ILO, OECD, and national agencies. Since the measures of Aleksynska & Schindler end in 2005, that is, before the start of our sample in 2007, we use the updated measures computed by Ellul, Pagano & Schivardi (2018).[5]

[5] These data were kindly provided by Andrew Ellul. For some countries, the 2014 value was not available, in which case we used the 2013 computed value for public unemployment insurance in 2014. Note that public unemployment insurance does not change over the period considered in this study for most countries in our sample.

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3.2.3. Control variables

We consider several country-level and firm-level control variables. As a first country-level control, we take into account the effect of access to credit in a country. The owners of private firms are typically reluctant to issue outside equity because it is costly and would dilute their control (Brav, 2009). Their main external finance source is debt, but the amount of debt they can borrow is limited by costly bankruptcy. Furthermore, their small scale limits access to public debt markets, and concentrated ownership and informational opacity create significant agency problems of debt, which further hamper access to debt (Berger & Udell 1998; García-Teruel & Martínez-Solano, 2008). These limitations to external finance create a strong precautionary motive to hold cash, which will be reinforced by shareholder risk aversion if the controlling shareholders are under-diversified (Anderson & Hamadi, 2016; Duchin, 2010). It can be argued that the increasing ability to get credit on a short notice reduces the need for private firms to hold large cash reserves. This argument would imply a negative relationship between credit availability and corporate cash holdings. On the other hand, an environment that facilitates access to credit makes it easier for private firms to fund cash holdings, which could lead to higher cash holdings of private firms.[6] We include *private credit* provided by deposit money banks over GDP in each year as a measure of credit availability. We use the indicator from the Financial Development and Structure Database of the World Bank, which is based on data from the IMF's International Financial Statistics and measures credit issued to the private sector by deposit money banks (Beck, Demirguç-Kunt & Levine, 2000; Levine, 2002). It does not include credit issued to governments and state-owned enterprises.

Access to credit also depends on the legal environment in which firms borrow money (e.g., Djankov, McLiesh & Shleifer, 2007; La Porta, Lopez-de-Silanes, Shleifer & Vishny,

[6] In this respect, it is interesting to note that even for public firms, Dittmar, Mahrt-Smith & Servaes (2003) find a positive relation between corporate cash holdings and the availability of private credit in a country.

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1997; Qian & Strahan, 2007). *Legal Rights* is the country-level strength of legal rights index of the World Bank, measuring the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending for each year. The index ranges between 0 (weak) and 12 (strong).[7] Furthermore, the enforceability of contracts matters for how loans are structured and how they are priced (e.g., Bae and Goyal, 2009). *Rule of law* is the country-level rule of law score for each year developed by the World Bank, measuring the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence. We use the aggregate country scores, which range from approximately -2.5 (weak) to 2.5 (strong) (see www.govindicators.org for more information).[8]

Additionally, we use annual *GDP growth* as a control for economic growth. We further include measures of employment regulation (e.g., Serfling, 2016; Simintzi, Vig & Volpin, 2015), and the degree of unionization in countries (e.g., Huang, Jiang, Lie & Que, 2017; Klasa, Maxwell & Ortiz-Molina, 2009; Matsa, 2010). *Legal labor protection* is a synthetic indicator constructed by the OECD, which measures the strictness of regulation against dismissals in regular labor contracts (e.g., Simintzi, Vig & Volpin, 2015).[9] *Union density* is also obtained from the OECD and measures the ratio of wage and salary earners that are trade union members to the total number of wage and salary earners, based on surveys wherever possible or on administrative data adjusted for non-active and self-employed members otherwise. Both

[7] See https://www.doingbusiness.org/en/methodology/getting-credit for more information on the construction of this measure.

[8] In unreported regressions we additionally include the ratio of general government gross debt over GDP (source: IMF) as a determinant of corporate cash holdings. High government debt may reduce the availability of credit to private firms, thereby increasing the need to hoard cash. Including this variable does not affect our findings on the relation between public unemployment insurance and corporate cash holdings.

[9] The 2014 score for labor protection was not available for some countries. In those cases, we again used the 2013 score. Importantly, prior evidence indicates that employment laws remain very stable over time. Capron & Guillén (2009), for instance, report a 0.95 correlation between their labor rights index of the early 1990s and the index of the early 2000s.

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dimensions of labor protection have been found to affect corporate financing policies of public firms. Stronger labor protection may lead to more cash holdings because it reduces wage flexibility and makes it more difficult to lay off employees. The resulting increase in operating leverage makes firms riskier (Chen, Kacperczyk & Ortiz-Molina, 2011), which could increase their demand for precautionary cash. However, better labor protection could also induce firms to keep *less* cash, because higher cash holdings weaken the bargaining position of firms against their employees (Klasa, Maxwell & Ortiz-Molina, 2009). When a firm has less cash, it can make a more credible case to its employees that the risk of a cash shortage threatens its competitive position. Firms may, therefore, try to keep cash holdings low to shelter profits from employees' demands.[10]

We also control for firm-level variables that are obtained from the Orbis database. As for the firm-level determinants of cash holdings, we consider a number of variables that have been found to affect cash holdings (e.g., Bigelli & Sánchez-Vidal, 2011; Dittmar, Mahrt-Smith & Servaes, 2003; Gao, Harford & Kai, 2013; Hall, Mateus & Bezhentseva Mateus, 2014; Opler, Pinkowitz, Williamson & Stulz, 1999; Ozkan & Ozkan, 2004), taking into account the information available in the Orbis database. The Pecking Order Theory of Myers & Majluf (1984) predicts that profitable firms will accumulate cash to finance future investments, while firms with low cash flows will use their cash to finance investment, resulting in a positive relation between *ebit* and cash holdings.[11, 12] It also predicts that firms will only take on debt when they do not have enough internal funding to finance their investments. This behavior is

[10] Additionally, from an agency perspective, labor unions are a governance mechanism which may limit managers' access to free cash flow.

[11] We consider ebit rather than a cash flow measure because the information in the Orbis database does not allow us to estimate cash flows for many firms in our sample.

[12] It can be expected that capital expenditures will reduce cash holdings (e.g., Bigelli & Sánchez-Vidal, 2011). Unfortunately, since depreciation is not available for a large part of our sample, we also have no clean measure of capital expenditures. However, when we add the increase in (the natural log of) net assets as a proxy of capital expenditures in the regressions of Table 5, this does not affect our findings for public unemployment insurance at all.

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likely to result in a negative relation between *leverage* and cash. Cash is a buffer that can absorb negative shocks. Firms with more volatile profits, as measured by *volatility*, are therefore likely to hold more cash for precautionary reasons, to protect themselves against the likelihood of a cash shortfall (Bigelli & Sánchez-Vidal, 2011). Larger and older firms may find it easier to get external financing because of lower asymmetric information. We therefore also include *log(size)* and *log(age)* as cash holdings determinants.[13] Size additionally takes into account economies of scale in cash management. Following Bigelli & Sánchez-Vidal (2011), Gao, Harford & Kai (2013) and Opler, Pinkowitz, Williamson & Stulz (1999), *sales growth* is our measure of growth opportunities.[14] Since the cost of a cash shortage is higher for firms with strong growth opportunities, high growth firms are expected to hold more cash. *Net working capital* can be a cash substitute because it consists of assets that can be easily converted into cash (Dittmar, Mahrt-Smith & Servaes, 2003; Gao, Harford & Kai, 2013). We additionally include *intangibility*, defined as the ratio of intangible assets (may include R&D expenses and the value of patents, trademarks, and brands) to total assets, as a proxy for financial distress costs, which may induce firms to hold more cash (Bigelli & Sánchez-Vidal, 2011). Finally, a higher *tax rate* increases the tax benefits of debt and the opportunity cost of cash holdings (Bigelli & Sánchez-Vidal, 2011). Ebit, leverage, volatility, net working capital, sales growth, intangibility and tax rate are winsorized at the 1% lower and upper level.

3.3. Summary statistics and correlations

Table 2 reports for each country over the period 2007-2014 the number of firm-year observations, median cash holdings and average score of public unemployment insurance and

[13] We take the log of size and age to account for the non-linear effect on cash holdings found in other studies (e.g., Bigelli & Sánchez-Vidal, 2012; Gao, Harford & Kai, 2013; Ozkan & Ozkan, 2004).

[14] Obviously, we cannot use Tobin's Q as the firms in our sample are not listed.

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the other country characteristics.[15] Our sample includes 1,282,062 observations for European firms, 354,107 observations for firms in Asia, Australia, and New Zealand, and 43,738 observations for the Americas. The median cash to net assets ratio ranges from 0.03 in India and Peru to 0.52 in Singapore. Table 2 shows that we have a lot of variation in our sample with respect to country characteristics. Public insurance ranges between zero (Philippines, Singapore, Columbia, Peru) and 0.67 (Portugal). Private credit by deposit money banks is between 27.85% (Peru) and 194.37% (Hong Kong) of GDP. The Rule of Law index in our sample ranges between -0.73 (Argentina) and 1.96 (Finland), while the legal rights measure is between two (Argentina, Brazil, Italy, Portugal) and 12 (New Zealand), which is the highest possible score.

Table 3 reports summary statistics for the firm-level variables. The median (mean) cash (winsorized at 1%) holdings is 0.09 (0.23). The median (mean) ratio of debt (excluding trade credit) to net assets is 0.17 (0.24). Investment in net working capital, which is a potentially important alternative source of liquidity for private firms, is on average 28% of net assets (the median is also 28%).

Table 4 reports pairwise Pearson correlation coefficients between the variables. Consistent with our first hypothesis, public insurance is negatively related to cash holdings (r=-0.18). Cash holdings are positively related to private credit (r=0.18), rule of law (r=0.26) and legal rights (r=0.12). This suggests that more available credit, a stronger rule of law and better legal protection in a country increase cash holdings of private firms.

Table 4 further shows that public insurance is strongly and positively related to other measures of worker protection such as legal labor protection (r=0.66). Botero, Djankov, La Porta, Lopez-de-Silanes & Shleifer (2004) argue that in every country a complex system of laws protects the

[15] We report *median* cash holdings because our sample includes some outlying values for cash holdings. In the regression analysis, the effect of these outliers is absorbed by using log(cash) as the dependent variable (table 5) or by winsorizing cash at the 1% upper level (table 6).

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interests of workers. More specifically, they highlight that this complex system covers distinct bodies of laws: "Employment laws govern the individual employment contract. … Social security laws govern the social response to needs and conditions that have a significant impact on the quality of life, such as old age, disability, death, sickness, and unemployment" (p. 1339-1340). Our legal labor protection measure relates to the first body of laws, i.e., it is an indicator of strictness of regulation of individual employee contracts. These laws relate to the situation where there is (still) a relationship between the employer and employee. Public unemployment insurance relates to the second body of law. It captures the temporary income to individuals who are involuntarily unemployed and are actively seeking jobs in order to help them maintain lost income and their standard of living. Thus, these laws relate to the situation after the employer-employee relationship ended. While empirically correlated, it is clear that these are theoretically different constructs. As we detail below, in our subsequent multivariate regressions, we do take into account that these variables are highly correlated and run models with only public insurance and models with public insurance and the other measures of labor protection.

4. REGRESSION RESULTS

4.1. The determinants of cash holdings

To investigate the determinants of cash holdings, we estimate firm random effects regressions that include industry fixed effects based on 2-digit Standard Industrial Classification (SIC) and year fixed effects.[16] Results are reported in Table 5. Significance levels are based on robust standard errors clustered by countries.

Since this study is the first to investigate the determinants of cash holdings by private firms for a worldwide sample, we start by considering the relation between firm characteristics

[16] At this stage, we do not include country fixed effects, because these would largely absorb the effect of the public insurance, which for most countries in our sample does not change over the period considered in this study. For the same reason we cannot include firm fixed effects.

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and cash holdings in regression 1. The results are generally as expected. More profitable firms and firms with more volatile profits hold more cash. The results also suggest that net working capital is a significant substitute for cash holdings.[17] Furthermore, larger firms hold less cash, which is consistent with economies of scale in cash management. Interestingly, we find that older firms hold more cash, which does not support the information asymmetry argument but confirms the results of Gao, Harford & Kai (2013) on cash holdings of private U.S. firms. This finding is consistent with a life-cycle effect where mature firms hold more cash than young firms because they are more profitable and have fewer attractive investment opportunities (e.g. DeAngelo, DeAngelo & Stulz, 2006). The coefficients for the other firm characteristics are not statistically significant.

We add country characteristics in regression 2. Both private credit and rule of law are significantly and positively related to cash holdings, suggesting that an increase in credit availability and a stronger rule of law leads private firms to hold *more* cash. These findings are consistent with the argument that more developed credit markets and a stronger rule of law facilitate cash holdings by private firms. GDP growth is also positively and significantly related to corporate cash holdings. It is noteworthy that including country characteristics strongly increases the explanatory power of our empirical model: the R^2 increases from 0.191 in regression 1 to 0.256 in regression 2, confirming that the country environment in which private firms operate explains a large part of the variation in their cash holdings.

Legal Rights has a statistically significant negative effect in regressions 3, 4 and 5, while Rule of Law has a significant positive effect on cash holdings, which is remarkable since both variables are strongly correlated (r = 0.64 for our sample). While Legal Rights measures

[17] The individual components of net working capital (trade receivables, inventories and trade payables) are likely to have different effects on cash holdings (Wu, Rui & Wu, 2012). To ascertain that this does not influence our results for public insurance, as a robustness check we re-estimated our main regressions with trade receivables, inventories and trade payables as separate variables. The results are very similar to the ones reported in the paper.

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the degree in which the law facilitates access to credit, Rule of Law measures the extent to which people have confidence in and abide by the laws. This is a related but different concept. A number of studies have found that corporate cash holdings are negatively related to corruption, arguing that firms hold less cash in more corrupt environments because cash holdings facilitate expropriation of the firm in a corrupt environment (Andriosopoulos, Loncan & Michaely, 2019; Caprio, Faccio & McConnell, 2013; Smith, 2016; Svensson; 2003). Since the concept of corruption is closely related to the rule of law (there is an almost perfect correlation between the Control of Corruption index and the Rule of Law index of the World Bank), this might be the driving force behind the positive relation between the Rule of Law and cash holdings we find. The negative relation between Legal Rights and cash holdings, on the other hand, might reflect that an improvement in legal rights facilitates access to debt and therefore reduces the need to hold cash.

When we add our key variable public unemployment insurance in regression 3, it is statistically significant at the 0.1% level and negatively related to corporate cash holdings, confirming Hypothesis 1 that better public unemployment insurance reduces the need for firms to hold precautionary cash.[18] This effect is also economically significant: a one standard deviation increase in public insurance decreases cash holdings by 32.6%.[19] We found in table 3 that public unemployment insurance is positively correlated with legal labor protection and union density. When both dimensions of labor protection are added in regression 4, the negative effect of public unemployment insurance remains highly significant.[20] Legal labor protection

[18] The negative effect of public unemployment insurance remains significant at the 0.1% level when we replace Rule of Law with the Control of Corruption index of the World Bank, which is significantly and positively related to cash holdings. This is also the case when we exclude Rule of Law or Legal rights from the regression.

[19] The economic significance is calculated as: $Ln(cash_1) – ln(cash_0) = ln(cash_1/cash_0)$ = st.dev. (public insurance) * coefficient public insurance = 0.193 * (-2.046) = -0.395. Percentage change in cash = exp(-0.395) – 1 = -32.6%.

[20] Multicollinearity could be a concern for the interpretation of Regression 4. Nevertheless, in situations where multicollinearity is a concern, the standard error of the coefficients (of two or more highly correlated variables) will increase. By overinflating the standard errors, multicollinearity makes some variables statistically insignificant when they should be significant. Accordingly, although multicollinearity works against finding

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and union density are also negatively related to cash holdings, confirming that private firms hold less cash in countries where unemployment risk for employees is lower.

We also consider the possibility that the effect of public unemployment insurance is non-linear: the marginal benefit of increasing public unemployment insurance could be larger at lower levels of insurance than at higher levels of insurance. When we distinguish between countries where public insurance is weak (regression 5) and countries where public insurance is strong (regression 6), using the median public insurance as split-off value, we find confirmation of a non-linear effect. The effect of public insurance is statistically significant only for countries with weak public insurance.[21] In other words, differences in public insurance matter for cash holdings below the median public insurance value of 0.44, but not anymore above the median.

Our results are confirmed by some robustness checks, of which the findings are reported in the appendix. First, our results are confirmed when cash (winsorized at 1%) is the dependent variable instead of log(cash) (Table A.1).[22] Instead of random effects regressions, we estimated OLS regressions and cross-sectional regressions on the mean value for all variables, again with very similar results (Table A.2). Our results might be affected by survivorship bias because disappearing firms are deleted from the Orbis dataset after three years. To ascertain that survivorship does not drive our results, we re-estimated all regressions for a subsample that includes only the years 2012, 2013 and 2014, which are not affected by survivorship. Again, our base results are confirmed (Table A.2). Our sample consists of privately held firms, including large firms, which raises the question to what extent the results in Table 5 reflect policies of small and medium-sized enterprises (SMEs). To check whether

support for our Hypothesis 1, we still find a negative and highly significant coefficient for Public insurance in Regression 4.

[21] A Chow test further confirms that the coefficients of public insurance are significantly different in regressions 5 and 6 (F-statistic = 3,611.37).

[22] The results are also confirmed when we winsorize cash at the 2% level.

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our findings apply to SMEs, we re-estimated all the regressions in Table 5 for a sample consisting of firms with no more than 250 employees.[23] The results in Appendix Table A.3 fully confirm those for the full sample. Finally, the effect of public unemployment insurance on cash holdings might be weaker for high risk firms because these firms need high cash balances, irrespective of public unemployment insurance.[24] We test this conjecture by estimating separate regressions for low risk firms (i.e. volatility < sample median) and high risk firms (i.e. volatility ≥ sample median) and estimating a regression which includes the interaction between public unemployment insurance and volatility. The results, which are reported in Appendix Table A.4, indicate that the effect of public unemployment insurance is indeed significantly weaker for high risk firms compared to low risk firms, but it remains highly significant.

4.2. Change in cash holdings

To test Hypothesis 2, we estimate an empirical model that closely follows models of Almeida, Campello & Weisbach (2004) and Kusnadi & Wei (2011), and takes into account the availability of data for private firms in the Orbis database:

$$\Delta Cash_{it} = a + b_1 \Delta Leverage_{it} + b_2 \Delta Log(size)_{it} + b_3 Ebit_{it} + b_4 \Delta Net\ working\ capital_{it} + b_5 Log(size)_{it} + b_6 Sales\ growth_{it} + b_7 (Industry\ FE)_i + b_8 (Year\ FE)_t + b_8 (Country\ FE)_i + e_{it} \quad (1)$$

The effect of the change in leverage reflects the extent to which a change in debt is associated with a change in cash holdings.[25] Since depreciation is not available for a large part of our sample, we use the increase in (the natural log of) net assets as a proxy of investments and ebit as a proxy for cash flow. Additionally, the effect of the change in net working capital reflects the degree to which net working capital and cash holdings are substitutes. Following

[23] Applying this threshold reduces the sample to 933,645 observations because we lack information on employees for a substantial number of countries. Countries for which the number of employees is not known are left out of the SME sample.

[24] We thank an anonymous reviewer for pointing this out.

[25] This analysis is based on cash holdings winsorized at the 1% upper level. We obtain very similar results when the dependent variable is the change in unwinsorized log(cash), see Appendix Table A.5.

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Almeida, Campello & Weisbach (2004) and Kusnadi & Wei (2011), we also include log(size) as a measure of economies of scale in cash management and sales growth as a measure of investment opportunities. An advantage of focusing on changes in cash is that it allows controlling for country fixed effects, which was not possible in the previous regressions because in most countries in our sample public unemployment insurance did not change over the period considered in this study. We also control for industry and year fixed effects (Kusnadi & Wei, 2011).[26]

We estimate model (1) separately for countries with weak (i.e. below median) public unemployment insurance and countries with strong (i.e. above median) public unemployment insurance. The results are reported in Table 6. We find indeed that an increase in leverage is more strongly associated with an increase in cash holdings in countries with weak public unemployment insurance (regression 7) than in countries with strong public unemployment insurance (regression 8).[27] This finding again confirms the effect of public unemployment insurance on corporate cash holdings. Additionally, we include the interaction between Δ Leverage and the level of public unemployment insurance in regression 9, which is estimated for the full sample. The interaction has a statistically significant and negative effect on change in cash, confirming Hypothesis 2 that the issuance of new debt by privately-held firms results in larger cash balances in countries with weaker public unemployment insurance.[28] The effect of public insurance is also economically significant: a one standard deviation increase in public

[26] The model does not include the main effect of the Public Insurance variable because its effect is absorbed by the country fixed effects.

[27] A Chow test further confirms that the coefficients of leverage are significantly different between regressions 7 and 8 (F-statistic = 2,818.14).

[28] When we additionally include the interaction between Ebit and public insurance in the regression, the coefficient of this interaction term is negative but not statistically significant. This finding indicates that weaker public unemployment insurance does not significantly increase the propensity to save cash out of cash flows. Cash flows are volatile and firms may prefer a more stable source of funding for precautionary cash balances to provide unemployment insurance.

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insurance reduces the effect of a change in leverage on the change in cash by 22.9%.[29] Again, our results are fully confirmed if we consider SMEs only (see Appendix Table A.6).

5. CONCLUSION

While there have been many studies on the determinants of cash holdings by publicly-traded firms, we do not know much about what determines cash holdings by privately-held firms. This lack of research is remarkable since private firms are the dominant corporate form across the world. Our evidence suggests that private firm managers use cash resources to govern the employer-employee relationship. More specifically, private firm managers hold larger cash balances in countries with weaker unemployment protection to reduce (prospective) employees' perceptions of unemployment risk.

This paper is the first to study the determinants of cash holdings by private firms for a worldwide sample. The scarce literature on cash holdings of private firms focuses on a single country (Bigelli & Sánchez-Vidal, 2011; Deloof, 2001; Gao, Harford & Kai, 2013; García-Teruel & Martínez-Solano, 2008; Martínez-Sola, García-Teruel & Martínez-Solano, 2018) or on a geographically limited set of countries (Hall, Mateus & Bezhentseva Mateus, 2014). Our study allows us to examine the generalizability of results from these previous studies, which is an increasingly important concern in many research fields (Bettis, Helfat & Shaver, 2016). For instance, Italian evidence has shown that both bank debt and net working capital represent good cash-substitutes for private firms (e.g., Bigelli & Sánchez-Vidal, 2011). In our worldwide sample of private firms, we also find that net working capital is a substitute for cash holdings, which suggests this is a "stylized fact". But, we fail to find strong evidence that debt represents a good cash substitute (except in countries where public unemployment insurance is above the median level, which includes Italy).

[29] The economic significance is calculated as: st.dev. (public insurance) * coefficient (Δ leverage * public insurance) / coefficient (Δ leverage) = 0.193 * (-0.513) / 0.433 = -22.9%.

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In addition, our study also forms the basis for a broader contribution to an institution-based perspective (van Essen, Strike, Carney & Sapp, 2015) on cash holdings in private firms. Specifically, we focus on one of the most important but often ignored stakeholders of privately-held firms: employees. We find that an increase in public unemployment insurance significantly reduces cash holdings of private firms, especially at low levels of public unemployment insurance. Furthermore, private firms keep a larger part of debt issues as precautionary cash when public unemployment insurance is weak.

More generally, we find that cash holdings of private firms are substantially affected by country characteristics. Private firms hold more cash in an environment that facilitates access to debt, that is, countries with more developed private credit markets and a better rule of law. An explanation for this result is that better access to credit drives private firms to hold more cash because under-diversified shareholders wanting to keep control reduce their dependence on external financing. Private firms also hold less cash in countries with better legal protection of labor and stronger unions, which is consistent with the argument that cash holdings weaken the bargaining position of firms against their employees. Combined, our results show that the environment in which private firms operate matters a lot for their cash policy.

It is a limitation of our study that we cannot fully ascertain the causal effect of unemployment insurance on corporate cash holdings. Our empirical model may not fully capture country-level frictions in financial and labor markets. Substantial changes in the unemployment insurance system in some of the countries in our sample would allow for a difference-in-differences analysis. Unfortunately, there were no such 'shocks' in the period considered in this study. Furthermore, our sample covers an era in which many things happened in different countries: even if we were able to identify unemployment insurance shocks, it

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would be very hard to isolate the effect of these shocks.[30] However, our results hold after controlling for a large number of firm and country characteristics that affect corporate cash holdings (including other dimensions of labor market institutions), they are driven by those countries where unemployment insurance is weak or non-existent, and they are confirmed when we investigate the effect of debt issues on the change of cash holdings within firms.[31] All these results point to a causal effect of unemployment insurance on corporate cash holdings.

Our findings have implications for managers and policy-makers. For managers, our findings highlight that firm cash holdings will be significantly influenced by the business environment in which their firms operate. There is significant evidence that private firms and especially small and medium-sized firms, experience major difficulties in attracting employees (Williamson, 2000). Our results suggest that in countries with weak public unemployment insurance, firms try to provide employment insurance by holding larger cash balances. Whether this approach is indeed successful and eases the attraction of employees (or facilitates the retention of key employees) remains an important avenue for future research. For policy-makers, our findings suggest that a generous public unemployment insurance system not only benefits employees but also the firms by which they are employed. Indeed, while cash holdings entail an important cost, better public unemployment insurance for employees allows firms to reduce their investment in cash reserves.

[30] There was a reduction in public unemployment insurance in Denmark (2010) but we have only eight observations for Denmark, and there were increases in Ireland (2008) and Italy (2009) but these coincided with the financial crisis which hit both countries hard and makes it basically impossible to test the effect in a clean way.

[31] Note that this latter finding involves the interaction effect between the change in leverage and public unemployment insurance. Bun and Harrison (2019: 823) show that potential "endogeneity bias can be reduced to zero for the OLS estimator as far as the interaction term is concerned" and that "Whenever IV based inference procedures fail, we show that the OLS estimator of the coefficient of the interaction term is consistent, and that standard OLS inference applies."

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Table 1. Variable definitions and data sources

Variable	Description	Data source
Public insurance	Ratio of average unemployment insurance benefits an employee receives in the first two years of unemployment, relative to the employee's last gross wage	Andrew Ellul, as described in Ellul, Pagano & Schivardi (2018)
Other country characteristics		
Private credit	Private credit by deposit money banks / GDP	Financial Development and Structure Dataset World Bank
Rule of law	Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence	World Governance Indicators World Bank
Legal rights	Degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending	World Development Indicators World Bank
GDP growth	Growth of annual GDP	World Development Indicators World Bank
Legal labor protection	Strictness of employment protection (regular contracts)	OECD Employment Protection Database
Union density	Ratio of wage and salary earners that are trade union members, divided by the total number of wage and salary earners	OECD Employment and Labor Market Statistics
Firm characteristics		
Log(cash)	Natural log of (cash and cash equivalents / net assets)	Orbis Bureau Van Dijk
Ebit	Ebit / net assets	Orbis Bureau Van Dijk
Volatility	Standard deviation of (ebit / net assets)	Orbis Bureau Van Dijk
Log(size)	Natural log of net assets	Orbis Bureau Van Dijk
Log(age)	Natural log of firm age	Orbis Bureau Van Dijk
Sales growth	(Sales in year t / sales in year t-1) – 1	Orbis Bureau Van Dijk
Leverage	Debt (excluding trade credit) / net assets	Orbis Bureau Van Dijk
Net working capital	(inventories + receivables – payables) / net assets	Orbis Bureau Van Dijk
Intangibility	Intangible assets / net assets	Orbis Bureau Van Dijk
Tax rate	1 – (profit after tax / profit before tax)	Orbis Bureau Van Dijk

Note. This table shows the definition and data sources for the variables used in the empirical analysis. Net assets is total assets net of cash and cash equivalent. All variables are yearly measured except volatility, which is measured over the 2007-2014 period. All financial variables are expressed in USD. Ebit, volatility, net working capital, tax rate, sales growth, leverage and intangibility are winsorized at the 1% lower and upper level.

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Table 2. Cash (median) and country characteristics (average) by country, 2007-2014

Country	No. of obs.	Cash	Public insurance	Private credit	Rule of law	Legal rights	GDP growth	Legal labor protection	Union density
Asia and Australasia	*354,107*								
Australia	1,097	0.07	0.17	131.12	1.76	11.00	2.50	1.67	17.04
Hong Kong	1,265	0.19	0.11	194.37	1.55	7.00	3.09	.	.
India	3,653	0.03	0.13	49.62	-0.08	6.00	6.64	3.29	.
Israel	303	0.09	0.17	65.22	0.96	6.00	3.16	2.04	22.80
Japan	273,120	0.26	0.11	179.35	1.42	4.00	1.36	1.37	17.78
New Zealand	137	0.06	0.25	139.65	1.87	12.00	-0.54	1.56	21.04
Philippines	2,206	0.05	0.00	29.87	-0.54	3.00	6.62	.	.
Singapore	8	0.52	0.00	100.33	1.70	8.00	4.17	.	.
Thailand	41,088	0.04	0.13	128.57	-0.15	3.00	2.70	2.92	.
Turkey	31,230	0.05	0.15	53.15	0.08	3.00	4.19	2.31	7.00
Europe	*1,282,062*								
Austria	5,353	0.05	0.38	94.02	1.84	5.00	0.75	2.37	28.38
Belgium	19,940	0.08	0.35	56.20	1.40	4.00	1.65	1.89	55.02
Czech Republic	60,262	0.10	0.12	47.78	1.01	5.00	2.00	3.05	15.83
Denmark	8	0.12	0.35	189.01	1.92	8.00	0.38	2.17	66.89
Finland	19,250	0.09	0.31	87.34	1.96	7.00	-0.71	2.17	69.21
France	200,118	0.19	0.47	94.94	1.44	4.00	0.58	2.38	7.72
Germany	54,897	0.06	0.24	84.54	1.64	6.00	1.08	2.68	18.49
Greece	26,243	0.07	0.16	102.00	0.61	3.00	-3.24	2.80	22.60
Ireland	2,301	0.08	0.31	122.14	1.74	7.00	1.10	1.27	31.47
Italy	472,067	0.04	0.53	90.01	0.37	2.00	0.09	2.76	36.33
Netherlands	1398	0.05	0.50	116.35	1.81	3.00	1.40	2.82	18.37
Poland	46,126	0.05	0.11	49.64	0.75	7.00	3.28	2.23	14.58
Portugal	44,363	0.05	0.67	155.54	1.04	2.00	-1.13	4.13	19.76
Spain	222,823	0.06	0.50	161.36	1.13	5.00	-1.00	2.21	16.89
Sweden	45,927	0.14	0.36	123.12	1.95	6.00	1.24	2.61	68.22
Switzerland	490	0.12	0.53	156.58	1.80	6.00	1.80	1.60	17.12
United Kingdom	60,496	0.08	0.09	168.22	1.70	7.00	1.91	1.26	25.82
South America	*43,738*								
Argentina	82	0.06	0.17	13.31	-0.73	2.00	0.62	1.82	.
Brazil	1,218	0.05	0.08	73.00	-0.11	2.00	3.02	1.43	.

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Chile	32	0.08	0.11	99.67	1.34	4.00	3.98	2.63	15.03
Colombia	42,394	0.04	0.00	41.73	-0.39	4.00	4.39	1.37	.
Peru	12	0.03	0.00	27.85	-0.60	8.00	5.85	1.75	.
Total	*1,679,907*								

Note. Variable definitions and data sources are reported in Table 1.

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Table 3. Summary statistics for firm-level variables

	Median	Mean	St. dev.	Minimum	Maximum
Log(cash)	-2.42	-2.79	2.11	-17.07	12.39
Cash (winsorized at 1%)	0.09	0.23	0.37	0	2.20
Ebit	0.06	0.11	0.14	-0.14	0.92
Volatility	0.05	0.08	0.12	0.00	0.90
Log(size)	8.18	8.34	1.39	-3.00	20.43
Log(age)	3.09	3.09	0.80	0.00	4.76
Sales growth	0.03	0.18	0.92	-0.70	10.02
Leverage	0.17	0.24	0.24	0.00	1.00
Net working capital	0.28	0.28	0.28	-0.59	0.90
Intangibility	0.00	0.03	0.08	0.00	0.51
Tax rate	0.30	0.39	0.38	0.00	2.42

Note. This table shows summary statistics for the firm-level variables used in the empirical analysis. Variable definitions and data sources are reported in Table 1. All statistics are based on the full sample of 1,679,907 observations, except for labor protection (1,618,703 observations) and union density (1,562,332 observations).

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Table 4. Pearson correlation coefficients

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1. Public insurance	1.00															
Other country characteristics																
2. Private credit	-0.14	1.00														
3. Rule of law	-0.16	0.50	1.00													
4. Legal rights	-0.47	0.22	0.64	1.00												
5. GDP growth	-0.40	-0.14	0.00	0.26	1.00											
6. Legal labor protection	0.66	-0.61	-0.48	-0.45	-0.17	1.00										
7. Union density	0.23	-0.21	-0.20	-0.20	-0.17	0.24	1.00									
Firm characteristics																
8. Log(cash)	-0.18	0.18	0.24	0.12	0.05	-0.24	-0.17	1.00								
9. Ebit	-0.03	-0.13	0.08	0.10	0.07	0.05	-0.01	0.34	1.00							
10. Volatility	0.00	-0.06	0.09	0.09	0.01	0.03	-0.01	0.23	0.46	1.00						
11. Log(size)	-0.14	0.09	-0.01	0.08	0.03	-0.12	0.04	-0.27	-0.27	-0.28	1.00					
12. Log(age)	-0.32	0.10	-0.03	0.14	0.14	-0.19	-0.10	0.01	-0.11	-0.16	0.30	1.00				
13. Sales growth	0.03	-0.06	-0.06	-0.04	0.02	0.06	0.04	0.00	0.08	0.12	-0.08	-0.19	1.00			
14. Leverage	-0.17	0.32	0.13	0.03	0.01	-0.26	-0.09	-0.10	-0.20	-0.12	0.13	0.04	-0.03	1.00		
15. Net working capital	0.02	-0.03	-0.02	0.03	0.03	0.06	0.00	-0.14	0.00	-0.05	0.04	0.05	-0.03	0.04	1.00	
16. Intangibility	0.13	-0.09	0.05	-0.03	-0.01	0.04	-0.08	-0.01	0.02	0.01	-0.03	-0.17	0.02	0.01	-0.16	1.00
17. Tax rate	0.20	-0.13	-0.26	-0.33	-0.12	0.17	0.23	-0.15	-0.15	-0.08	0.01	-0.07	-0.01	-0.01	-0.01	0.03

Note. This table reports Pearson correlation coefficients for the variables used in the empirical analysis. Each correlation coefficient is based on the maximum number of available observations for both variables. Variable definitions and data sources are reported in Table 1. All correlations are significant at the 1% level except the correlation between Log(cash) and sales growth which is significant at the 5% level.

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Table 5. Public unemployment insurance and cash holdings

Sample:	(1) All firms	(2) All firms	(3) All firms	(4) All firms	(5) Public insurance < median	(6) Public insurance ≥ median
Public insurance			-2.046***	-1.311***	-3.903***	0.764
			(-5.606)	(-3.486)	(-3.910)	(1.473)
Other country characteristics						
Legal labor protection				-0.384*		
				(-2.410)		
Union density				-0.009***		
				(-3.743)		
Private Credit		0.008**	0.007***	0.005***	0.003	0.001
		(2.577)	(3.851)	(3.301)	(1.387)	(0.496)
Rule of Law		0.520**	0.638***	0.567***	0.875***	0.532***
		(2.967)	(3.820)	(5.986)	(3.543)	(6.888)
Legal rights		-0.073	-0.194**	-0.218***	-0.330***	0.080
		(-0.955)	(-3.019)	(-3.976)	(-3.390)	(1.596)
GDP growth		0.049***	0.031**	0.031**	0.007	0.046**
		(3.665)	(3.100)	(3.197)	(1.456)	(2.904)
Firm characteristics						
Ebit	2.761***	2.790***	2.762***	2.758***	2.593***	2.909***
	(17.249)	(20.355)	(18.908)	(17.585)	(13.000)	(13.357)
Volatility	0.713*	0.777***	0.838***	0.975***	0.955***	0.926***
	(2.215)	(5.933)	(6.822)	(8.748)	(4.775)	(23.184)
Log(size)	-0.451***	-0.445***	-0.443***	-0.459***	-0.364***	-0.523***
	(-11.372)	(-12.154)	(-11.960)	(-13.619)	(-14.215)	(-29.314)
Log(age)	0.350*	0.312***	0.221***	0.292***	0.156*	0.341***
	(2.259)	(4.434)	(3.467)	(8.095)	(1.967)	(8.645)
Sales growth	0.001	0.006	0.002	0.005	-0.016*	0.016***
	(0.068)	(0.737)	(0.215)	(0.684)	(-2.574)	(8.079)
Leverage	0.138	-0.216	-0.365*	-0.402*	-0.127	-0.604***
	(0.408)	(-1.051)	(-2.165)	(-2.275)	(-0.849)	(-3.357)
Net working capital	-0.977***	-0.939***	-0.876***	-0.877***	-0.733***	-0.991***
	(-8.590)	(-8.954)	(-7.263)	(-6.520)	(-12.017)	(-7.471)
Intangibility	-0.385	-0.288	-0.051	-0.158	0.075	-0.215
	(-0.964)	(-1.387)	(-0.303)	(-0.925)	(0.385)	(-1.264)
Tax rate	-0.106	-0.059	-0.051	-0.059	0.067***	-0.075*
	(-1.530)	(-1.238)	(-1.091)	(-1.356)	(4.207)	(-2.294)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	1,679,907	1,679,907	1,679,907	1,562,326	738,645	941,262
R^2	0.191	0.256	0.282	0.297	0.286	0.276

Note. This table shows regression results. The dependent variable in all regressions is log(cash). All reported results are based on random effects regressions. Variable definitions and data sources are reported in Table 1. T-statistics, based on standard errors clustered by countries, in parentheses.
$^{+}$ p<0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

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Table 6. Public unemployment insurance, change in leverage and change in cash holdings

	(7)	(8)	(9)
Sample:	Public insurance < median	Public insurance ≥ median	All firms
Δ Leverage * public insurance			-0.513*
			(-2.344)
Δ Leverage	0.375***	0.161***	0.433***
	(4.827)	(94.374)	(4.079)
Δ Log(size)	-0.321***	-0.313***	-0.316***
	(-12.426)	(-457.449)	(-10.040)
Ebit	0.260***	0.222***	0.238***
	(8.025)	(159.300)	(12.994)
Δ Net working capital	-0.356***	-0.225***	-0.266***
	(-8.373)	(-206.073)	(-5.425)
Log(size)	-0.001	-0.000+	-0.001
	(-0.828)	(-1.663)	(-0.822)
Sales growth	0.055***	0.054***	0.055***
	(5.165)	(166.161)	(6.327)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
N	473,958	699,912	1,173,870
R^2	0.369	0.307	0.331

Note. This table shows regression results. The dependent variable in all regressions is Δ Cash. All reported results are based on OLS regressions. Variable definitions and data sources are reported in Table 1, with Δ indicating a change in the variable. T-statistics, based on standard errors clustered by countries, in parentheses.
$^{+}$ p<0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

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Appendix: Results of additional analyses

Table A.1. The dependent variable is cash (winsorized at the 1% level) instead of log(cash)

	(1)	(2)	(3)	(4)	(5)	(6)
Sample:	All firms	All firms	All firms	All firms	Public insurance < median	Public insurance ≥ median
Public insurance			-0.192***	-0.081+	-0.411*	0.078
			(-4.403)	(-1.719)	(-2.354)	(0.483)
Other country characteristics						
Legal labor protection				-0.064***		
				(-3.727)		
Union density				-0.001		
				(-1.597)		
Private Credit		0.001**	0.001***	0.001***	0.001**	-0.000
		(2.813)	(4.659)	(3.667)	(2.783)	(-0.007)
Rule of Law		0.072**	0.081***	0.072**	0.099***	0.058***
		(3.211)	(3.940)	(3.265)	(3.804)	(3.976)
Legal rights		-0.016+	-0.027***	-0.032***	-0.032***	-0.001
		(-1.832)	(-4.330)	(-4.199)	(-3.443)	(-0.134)
GDP growth		0.004**	0.003*	0.003+	0.000	0.007*
		(2.732)	(2.049)	(1.956)	(0.273)	(2.224)
Firm characteristics						
Ebit	0.839***	0.843***	0.842***	0.849***	0.805***	0.881***
	(19.785)	(19.512)	(19.326)	(19.352)	(16.745)	(12.655)
Volatility	0.294***	0.315***	0.323***	0.352***	0.390***	0.291***
	(7.900)	(6.699)	(6.408)	(7.157)	(6.476)	(6.141)
Log(size)	-0.112***	-0.109***	-0.108***	-0.115***	-0.107***	-0.108***
	(-11.115)	(-11.891)	(-11.683)	(-11.964)	(-8.797)	(-6.844)
Log(age)	0.073**	0.070***	0.062***	0.078***	0.042*	0.090***
	(2.649)	(4.294)	(3.986)	(5.940)	(2.173)	(4.038)
Sales growth	-0.004+	-0.004+	-0.004+	-0.004	-0.009***	-0.001
	(-1.717)	(-1.724)	(-1.891)	(-1.641)	(-5.634)	(-1.031)
Leverage	0.143***	0.107***	0.096***	0.093***	0.111***	0.086***
	(5.478)	(8.248)	(9.136)	(8.593)	(7.055)	(4.517)
Net working capital	-0.243***	-0.238***	-0.233***	-0.233***	-0.286***	-0.213***
	(-5.811)	(-6.436)	(-6.345)	(-5.929)	(-9.127)	(-4.664)
Intangibility	-0.044	-0.040	-0.022	-0.034	0.028	-0.057
	(-0.613)	(-0.628)	(-0.342)	(-0.511)	(0.516)	(-0.805)
Tax rate	0.015*	0.019**	0.019**	0.018**	0.029***	0.015*
	(2.129)	(2.927)	(3.040)	(2.926)	(7.199)	(2.548)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	1,679,907	1,679,907	1,679,907	1,562,326	738,645	941,262
R^2	0.304	0.341	0.351	0.362	0.308	0.397

Note. This table shows regression results. All reported results are based on random effects regressions. Variable definitions and data sources are reported in Table 1. T-statistics, based on standard errors clustered by countries, in parentheses.
$^{+}$ p<0.10, * p < 0.05, ** p < 0.01, *** p < 0.00

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Table A.2. Pooled OLS, cross-section, and 2012-2014 period

Method/sample:	Pooled OLS		Cross-section		2012-2014 period	
Public Insurance	-2.229***	-1.808***	-2.325***	-1.866***	-2.000***	-1.413**
	(-5.203)	(-5.041)	(-6.020)	(-4.648)	(-4.793)	(-3.286)
Legal labor protection		-0.243^{+}		-0.256^{+}		-0.334
		(-1.904)		(-1.858)		(-1.548)
Union density		-0.011***		-0.010***		-0.012**
		(-4.500)		(-4.050)		(-3.629)
Private Credit	0.007***	0.006***	0.009***	0.007***	0.008***	0.006*
	(3.697)	(4.328)	(4.083)	(4.761)	(3.737)	(2.820)
Rule of Law	0.832***	0.740***	0.752***	0.697***	0.812***	0.745***
	(4.292)	(6.935)	(3.680)	(6.170)	(4.038)	(5.940)
Legal rights	-0.278***	-0.295***	-0.280***	-0.296***	-0.275**	-0.309***
	(-4.020)	(-5.642)	(-3.921)	(-5.194)	(-3.612)	(-4.958)
GDP growth	0.040^{+}	0.033**	0.044	0.016	0.049	0.039
	(2.038)	(3.052)	(1.640)	(1.213)	(1.425)	(1.271)
Ebit	3.600***	3.607***	3.852***	3.938***	3.580***	3.593***
	(15.736)	(14.874)	(16.366)	(16.716)	(13.887)	(13.050)
Volatility	0.943***	1.016***	0.567**	0.623**	0.848***	0.930***
	(7.377)	(7.627)	(3.520)	(3.576)	(6.352)	(7.047)
Log(size)	-0.321***	-0.335***	-0.294***	-0.316***	-0.321***	-0.334***
	(-11.866)	(-18.178)	(-10.683)	(-17.419)	(-11.877)	(-16.250)
Log(age)	0.167*	0.228***	0.127^{+}	0.197***	0.160*	0.231***
	(2.639)	(6.668)	(1.921)	(5.165)	(2.523)	(8.482)
Sales growth	-0.043**	-0.033*	-0.062**	-0.048*	-0.052***	-0.040**
	(-3.163)	(-2.690)	(-3.421)	(-2.760)	(-3.733)	(-3.242)
Leverage	-1.132**	-1.141**	-1.016**	-1.052*	-0.992*	-0.996*
	(-2.998)	(-2.852)	(-2.764)	(-2.640)	(-2.451)	(-2.285)
Net working capital	-0.853***	-0.869***	-0.768**	-0.751**	-0.772***	-0.778**
	(-4.362)	(-4.070)	(-3.490)	(-3.091)	(-3.819)	(-3.424)
Intangibility	-0.141	-0.372^{+}	-0.087	-0.237	-0.281	-0.464*
	(-0.615)	(-1.742)	(-0.342)	(-0.974)	(-1.283)	(-2.151)
Tax rate	-0.219*	-0.217*	-0.257	-0.260	-0.200	-0.201
	(-2.300)	(-2.422)	(-1.257)	(-1.280)	(-1.487)	(-1.463)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	No	No	Yes	Yes
N	1,679,907	1,562,326	388,940	364,317	789,796	722,096
R^2	0.298	0.313	0.366	0.385	0.318	0.333

Note. This table shows regression results.The dependent variable in all regressions is log(cash). Variable definitions and data sources are reported in Table 1. T-statistics, based on standard errors clustered by countries, in parentheses.

$^{+}$ p<0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

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Table A.3. Main regressions for SME sample (max. 250 employees)

Sample:	(1) All firms	(2) All firms	(3) All firms	(4) All firms	(5) Public insurance < median	(6) Public insurance ≥ median
Public insurance			-2.388***	-1.597***	-2.827***	0.788
			(-6.504)	(-4.342)	(-3.939)	(1.296)
Other country characteristics						
Legal labor protection				-0.352*		
				(-2.484)		
Union density				-0.011***		
				(-3.519)		
Private Credit		0.009**	0.008***	0.005**	0.004*	0.001
		(2.817)	(4.672)	(2.961)	(2.050)	(0.298)
Rule of Law		0.630***	0.481*	0.567***	0.555***	0.509***
		(3.621)	(2.489)	(4.615)	(3.373)	(7.136)
Legal rights		-0.118	-0.210**	-0.239***	-0.382***	0.082
		(-1.634)	(-2.898)	(-3.955)	(-4.239)	(1.445)
GDP growth		0.049**	0.035***	0.031**	0.013	0.032*
		(3.221)	(3.474)	(3.169)	(1.488)	(2.027)
Firm characteristics						
Ebit	2.856***	2.865***	2.823***	2.841***	2.514***	3.181***
	(13.819)	(15.099)	(13.823)	(13.485)	(11.108)	(12.239)
Volatility	0.858*	1.058***	1.099***	1.145***	1.250***	1.074***
	(2.169)	(6.917)	(7.065)	(7.216)	(5.085)	(8.305)
Log(size)	-0.513***	-0.510***	-0.510***	-0.507***	-0.433***	-0.563***
	(-10.489)	(-11.654)	(-11.093)	(-11.495)	(-11.401)	(-21.330)
Log(age)	0.467**	0.412***	0.284***	0.270***	0.228***	0.308***
	(2.884)	(7.752)	(7.279)	(6.974)	(4.902)	(9.405)
Sales growth	0.006	0.012	0.005	0.003	-0.013	0.016***
	(0.538)	(1.294)	(0.509)	(0.356)	(-1.317)	(4.954)
Leverage	0.197	-0.259	-0.459*	-0.482*	-0.195	-0.780**
	(0.555)	(-1.019)	(-2.077)	(-2.172)	(-1.243)	(-2.699)
Net working capital	-0.938***	-0.899***	-0.791***	-0.789***	-0.623***	-0.933***
	(-6.586)	(-6.609)	(-5.132)	(-4.949)	(-13.464)	(-5.376)
Intangibility	-0.590	-0.341	-0.059	-0.211	0.207	-0.263
	(-1.124)	(-1.234)	(-0.270)	(-1.059)	(0.865)	(-1.166)
Tax rate	-0.148*	-0.084+	-0.085+	-0.079+	0.048*	-0.100***
	(-2.033)	(-1.810)	(-1.926)	(-1.788)	(2.484)	(-4.480)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	933,645	933,645	933,645	920,280	421,774	511,871
R^2	0.191	0.267	0.299	0.305	0.298	0.245

Note. This table shows regression results. The dependent variable in all regressions is log(cash). All reported results are based on random effects regressions. Variable definitions and data sources are reported in Table 1. T-statistics, based on standard errors clustered by countries, in parentheses.
+ p<0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

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Table A.4. Firm risk and the effect of public insurance

Sample:	(1) Volatility < sample median	(2) Volatility ≥ sample median	(3) All firms
Public insurance	-2.388***	-1.635***	-2.205***
	(-5.963)	(-4.449)	(-5.342)
Public insurance x volatility			1.959*
			(1.997)
Other country characteristics			
Private Credit	0.008***	0.006***	0.007***
	(4.140)	(4.255)	(3.885)
Rule of Law	0.644**	0.534***	0.633***
	(3.031)	(3.950)	(3.819)
Legal rights	-0.231**	-0.178***	-0.191**
	(-2.622)	(-3.420)	(-2.971)
GDP growth	0.039***	0.024*	0.031**
	(3.702)	(2.494)	(3.086)
Firm characteristics			
Ebit	5.171***	2.560***	2.768***
	(11.559)	(18.282)	(18.802)
Volatility	7.332***	0.185	0.178
	(6.018)	(1.416)	(0.420)
Log(size)	-0.342***	-0.500***	-0.444***
	(-9.323)	(-15.569)	(-12.105)
Log(age)	0.166*	0.266***	0.222***
	(2.185)	(4.270)	(3.503)
Sales growth	0.024***	-0.009	0.002
	(3.376)	(-1.167)	(0.202)
Leverage	-0.233	-0.396*	-0.365*
	(-1.298)	(-2.476)	(-2.169)
Net working capital	-0.980***	-0.811***	-0.874***
	(-7.334)	(-7.475)	(-7.239)
Intangibility	-0.220	0.000	-0.047
	(-1.110)	(0.002)	(-0.282)
Tax rate	-0.032	-0.009	-0.050
	(-0.986)	(-0.166)	(-1.084)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
N	839,951	839,956	1,679,907
R^2	0.227	0.283	0.282

Note. This table shows regression results. The dependent variable in all regressions is log(cash). All reported results are based on random effects regressions. Variable definitions and data sources are reported in Table 1. T-statistics, based on standard errors clustered by countries, in parentheses.
+ p<0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

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Table A.5. Change analysis with Δ log(cash) (unwinsorized) as dependent variable

Sample:	Public insurance < median	Public insurance ≥ median	All firms
Δ Leverage * public insurance			-1.263+
			(-1.904)
Δ Leverage	0.771***	0.271	0.921***
	(4.271)	(1.308)	(4.260)
Δ Log(size)	-1.262***	-1.462***	-1.365***
	(-10.916)	(-50.103)	(-17.259)
Ebit	0.707***	0.711**	0.705***
	(13.654)	(5.017)	(8.860)
Δ Net working capital	-0.999***	-1.017***	-1.010***
	(-11.438)	(-17.558)	(-18.500)
Log(size)	-0.008+	-0.014*	-0.012**
	(-1.999)	(-2.795)	(-3.295)
Sales growth	0.253***	0.313***	0.291***
	(7.082)	(8.123)	(9.836)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
N	473,958	699,912	1,173,870
R^2	0.140	0.099	0.109

Note. All reported results are based on OLS regressions. Variable definitions and data sources are reported in Table 1, with Δ indicating a change in the variable. T-statistics, based on standard errors clustered by countries, in parentheses.
+ $p<0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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Table A.6. Change regressions for SME sample (max. 250 employees)

Sample:	(7) Public insurance < median	(8) Public insurance ≥ median	(9) All firms
Δ Leverage * public insurance			-0.686**
			(-3.002)
Δ Leverage	0.549***	0.261***	0.648***
	(11.683)	(24.463)	(9.346)
Δ Log(size)	-0.800***	-0.606***	-0.691***
	(-8.888)	(-127.632)	(-10.168)
Ebit	0.490***	0.351***	0.418***
	(6.848)	(37.428)	(7.139)
Δ Net working capital	-0.628***	-0.259***	-0.380***
	(-13.702)	(-36.347)	(-4.144)
Log(size)	-0.003	-0.004***	-0.004
	(-0.638)	(-4.388)	(-1.523)
Sales growth	0.114**	0.121***	0.125***
	(3.777)	(47.729)	(8.764)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
N	271,612	391,970	663,582
R^2	0.117	0.049	0.075

Note. This table shows regression results. The dependent variable in all regressions is Δ Cash. All reported results are based on OLS regressions. Variable definitions and data sources are reported in Table 1, with Δ indicating a change in the variable. T-statistics, based on standard errors clustered by countries, in parentheses.
$^{+}$p<0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

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