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Investment–cash flow sensitivity and investor protection

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Abstract

We examine the role of country-level legal investor protection (i.e., shareholder and creditor protection) on firm investment–cash flow sensitivity (ICFS). Using underexplored research data on investor protection across 21 countries and working with a conservative empirical design, we extend prior literature on the relation between investor protection and ICFS and provide new evidence on how these country-level attributes interact to explain a firm's ICFS. We find that either the strong legal protection of minority shareholders or the strong legal protection of creditors reduces the sensitivity of investment to internal cash flow. However, in countries with strong levels of both minority shareholder and creditor protection, ICFS increases. Our results remain robust after controlling for several alternative explanations. The results support the argument that overregulation arises when policymakers increase investor protection at levels that lead firms to avoid external sources of finance, hampering firm investment. Our findings suggest that countries face a regulatory trade-off such that increasing investor protection (either shareholder or creditors protection) enhances financial markets efficiency, but excessive regulation can indeed lead to financial markets inefficiencies.

KEYWORDS
investment-cash flow sensitivity, creditor protection, minority shareholder protection, over-regulation, cross-country

JEL CLASSIFICATION
G31, G32, G38

1 | INTRODUCTION

> *The last 10 years have been the toughest of my career—and that is all down to regulations. They are swamping us.*
>
> *A corporate treasurer at an FTSE 250 manufacturing company.*
>
> David Oakley [1]

Corporate finance research provides consistent evidence that investor protection fosters the development of financial markets (La Porta et al., 1997; Larkin et al., 2018) and drives firms' investment and financial choices (Döring et al., 2018). However, little is known about whether the strength and balance of protection to different suppliers of capital—shareholders and creditors—can lead to differing equilibria in firm investment behavior. Because minority shareholders and creditors coexist and have different and sometimes conflicting interests (Giofré, 2013), country-level legal institutions can protect these suppliers of capital disproportionately, being beneficial to one type of investor and detrimental to the other. For example, strong minority shareholder protection may attract equity investment but damage creditor interests since shareholders tend to be more prone to risk-taking activities than is optimal for creditors. In contrast, strong creditor protection may favor the supply of debt financing while discouraging equity investment if firms engage in risk-reducing practices (Acharya, Sundaram, & John, 2011; Giofré, 2013).

By focusing on economic development (Larkin et al., 2018), institutional framework (Döring et al., 2018) and asset tangibility (Moshirian et al., 2017), prior research provides relevant insights into firm- and country-level determinants of investment–cash flow sensitivity (ICFS) around the world. However, this research has overlooked how the interplay between country-level legal institutions protecting different types of suppliers of capital can explain cross-country variations in ICFS. Further, prior research tends to consider investor protection as either a homogeneous and aggregated construct (Larkin et al., 2018) or isolated constructs (Döring et al., 2018), without accounting for the joint effect of different legal institutions protecting minority shareholders and creditors. Thus, our understanding of the determinants of ICFS may be incomplete.

In this study, we fill this gap by investigating whether the differences between the strength with which a country protects the interests of minority shareholders and creditors affect firms' ICFS. In doing so, we recognize the potential trade-off that policymakers face when determining the strength of regulations that protect different suppliers of capital, that is, minority shareholder protection and creditor rights. We contend that the variation in country-level legal institutions intended to protect the interests of minority shareholders and creditors is crucial to explaining why we observe variations in ICFS across firms and economies.

Using a sample of 54,541 firm-year observations from 21 countries between 2010 and 2019, we first provide evidence that ICFS decreases in countries where protection is relatively strong for at least one supplier of capital (either minority shareholders or creditors), compared to countries where protection is weak for both suppliers of capital. This

[1] David Oakley, "EU regulations blamed for 'swamping' businesses." *Financial Times*, February 2, 2016.

evidence corroborates the law and economics argument postulating that strong legal protection of suppliers of capital improves the efficiency of capital markets, easing firms' access to external finance (La Porta et al., 1997). This result is also in line with prior research showing that ICFS is higher for firms in countries with a weaker institutional framework (Döring et al., 2018).

However, we show that, when countries combine high levels of protection for both suppliers of capital, shareholders and creditors, firms show higher levels of ICFS, compared to countries providing strong protection to only one supplier of capital. This result reveals an unintended effect of investor protection, suggesting that under the "overprotection" of suppliers of capital, firms are reluctant to issue debt or equity, relying on internal cash flow to fund investment opportunities, increasing ICFS. We interpret this novel evidence as an overregulation effect in which the positive effect of one legal provision can reduce the effectiveness of the other, leading to institutional crowding out (Bowles, 2004).

Our results are robust to several alternative explanations of ICFS, including the issuance of debt and/or equity (Döring et al., 2018; Larkin et al., 2018), firms' financial constraints (Fazzari et al., 1988), asset tangibility (Moshirian et al., 2017), the presence of negative cash flow (Larkin et al., 2018), the presence of a controlling shareholder (Wei & Zhang, 2008), Tobin's Q measurement errors (Erickson & Whited, 2000; Lewellen & Lewellen, 2016), country's economic development (Larkin et al., 2018) and bank- versus market-based financial systems (Levine, 2002). In addition, in line with Gatchev et al. (2010), Dasgupta et al. (2011), Chang et al. (2014) and Drobetz et al. (2019), our analyses take into account that the sources of funds are equivalent to the use of funds (interdependence of financial decisions) and that financial decisions are intertemporally dependent in the estimation of our investment models accounting for alternative uses of funds and lags of cash flow besides investment.

Given our distinction between country-level legal provisions enhancing minority shareholders' and creditors' protection, we not only provide a more nuanced perspective on the effects of investor protection in ICFS but also support the argument that some countries make a deliberate choice to unbalance the property rights of different stakeholders (Rajan & Zingales, 1995). Understanding the complex interplay among such legal institutions that protect different suppliers of capital is important to several market players. First, this interaction informs policymakers that investor protection regulations that aim to increase capital markets' efficiency can have unintended consequences. Second, this understanding helps managers to adjust investment and financing decisions, given the constraints of the legal environment and the influence of external investors. Third, it allows outside investors to choose the more suitable instrument—debt or equity—for their risk-return preferences, adjusting their choices to different institutional settings. Finally, in a broader sense, it advances our understanding of how legal institutions enable or constrain the development of capital markets.

Our study contributes to both corporate finance and corporate governance literatures. We respond to recent calls from governance scholars for a deeper understanding of the role of country-level legal institutions in firm-level decision-making (Aguilera et al., 2015; Hoskisson et al., 2013). Further, we show that the strength of country-level governance mechanisms affects not only the supply of external capital but also firms' demand for external financing, shedding new light on the determinants of firm investment behavior in a cross-national context. Our findings suggest that firms tend to face a trade-off between their need for funds and their desire for control (or lower external monitoring), leading to suboptimal investment decisions. As we show that previously important corporate factors or characteristics (e.g., financial restriction and asset tangibility) do not change our main results, we infer that overregulation affects all firms in similar ways. In addition, we provide relevant insights into the corporate governance convergence and enforcement debates since we show that countries may adapt the level of investor protection to their political and economic environments, including the choice to protect different investors asymmetrically (Deakin et al., 2017; Giofré, 2013; Rasheed & Yoshikawa, 2012).

This paper proceeds as follows. Section 2 presents the related literature and our hypotheses development. Section 3 describes our country- and firm-level data and empirical methodology, including variable definitions and descriptive statistics. In Section 4, we present descriptive statistics. Section 5 describes our results, evaluating alternative explanations. Finally, in Section 6, we conclude the paper.

2 | BACKGROUND AND HYPOTHESES DEVELOPMENT

2.1 | ICFS

Despite the corporate finance discussion of whether ICFS is a matter of investment opportunities (Gomes, 2001; Kaplan & Zingales, 1997), demand for liquidity (Almeida et al., 2004) or financial restrictions (Fazzari et al., 1988), scholars agree that the relation between investment and cash flow emerges from inefficiencies in financial markets (Almeida & Campello, 2007; Döring et al., 2018; Francis et al., 2013; Hubbard, 1998; Larkin et al., 2018; Lewellen & Lewellen, 2016). Indeed, prior research shows that the relevance of a firm's internal cash flow in explaining investment choices also depends on the type and level of agency costs within the firm (Pawlina & Renneboog, 2005; Wei & Zhang, 2008), as well as the extent to which investors perceive the effectiveness of firm-level governance mechanisms in minimizing them (Francis et al., 2013; Kuo & Hung, 2012). Overall, these studies provide consistent evidence that, in firms where investors perceive a greater potential for expropriation by managers or large shareholders, the cost of external financing is higher, increasing firm ICFS.

A complementary stream of literature examines ICFS when there are no positive net present value (NPV) projects and firms rely upon internal funds to finance low-return or even negative-return projects. Jensen (1986) proposes that a positive relation between investment and cash flow can be a byproduct of an agency problem of free cash flow in which insiders use the excess cash to finance low-return projects, overinvesting a firm's resources at the expense of outside investors (i.e., the managerial discretion perspective). Indeed, Hoshi et al. (1991) analyze two sets of Japanese firms, one with close ties to banks (where information asymmetries are likely to be low) and a second group of firms with no such ties. These authors find higher ICFS in the second group and conclude that managerial discretion over free cash flow prevails over asymmetric information. More recently, Lewellen and Lewellen (2016) examine the ICFS of US firms from 1971 to 2009 and conclude that free cash flow problems are relevant to investment behavior.

Although both asymmetric information and managerial discretion imply a positive effect of cash flow on the level of investment, the outcome may depend on the type of investor (i.e., shareholders or creditors). On the one hand, according to the asymmetric information perspective, because lenders have incomplete information about the quality of firm investment projects, firms cannot obtain resources for all positive NPV projects. This leads to an underinvestment problem. For these firms, investment becomes conditional on their ability to generate internal funds, which creates a greater sensitivity of capital investment to internal cash flow. On the other hand, shareholders suffer losses if firm investment hinges on externally financed funds, because the NPV may turn negative due to a higher cost of capital (Kathuria & Mueller, 1995). Under the managerial discretion perspective, firms invest in negative-NPV projects when marginal returns are below the cost of capital. In this case, manager overinvestment decisions harm outside investors. In the words of Jensen (1986, p.323), "the problem is how to motivate managers to disgorge the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies." This discussion leads to the question: What is the solution to the problems of asymmetric information and managerial discretion? One alternative answer is the development of a legal framework at the country level that protects the supply side of capital—for example, minority shareholder protection or creditor rights—by addressing asymmetric information, as well as managerial discretion and market frictions.

2.2 | Investor protection and ICFS

When a firm's corporate governance does not work efficiently to curb adverse selection (Akerlof, 1970) or moral hazard problems (Hart, 1995), legal and regulatory practices come into play to resolve problems caused by the divergence between managerial decisions and what would be optimal from the external investor standpoint. Therefore, country-level legal institutions, such as disclosure regimes, takeover restrictions and corporate and bankruptcy laws emerge as

an alternative to reduce information asymmetries, facilitate external monitoring and enhance market efficiency, thus preserving outside investor interests (La Porta et al., 1997, 2000). Indeed, prior studies document that legal institutions protecting the interests of suppliers of capital reduce information asymmetries and transaction costs, increasing the supply of capital and fostering the development of financial markets (Deakin et al., 2017; La Porta et al., 2000).

Because financial markets are not perfect, the law and economics literature (La Porta et al., 1998; Shleifer & Vishny, 1997) proposes that any corporate governance system is only as good as the institutions that ensure effective investor protection. The key assumption is that legal institutions that enhance investor protection may reduce market imperfections, which in turn assure the availability of external finance. Once external finance is available, firms' investment is primarily contingent on investment opportunities and the cost of capital. More so, because equity (shareholders) and debt (creditors) financing coexist and represent two alternative sources of external finance, countries can regulate the supply of capital by either increasing minority shareholder protection or creditor rights. In other words, by strengthening legal institutions that enhance property rights and protect the suppliers of capital—either minority shareholders or creditors—external finance will be available to fund value-adding projects, and one can expect firm investment to be less dependent on internal funds, which leads to the following hypothesis:

Hypothesis 1: Firms operating in countries with strong legal protection for at least one supplier of capital—either strong minority shareholder protection or strong creditor protection—exhibit lower ICFS than firms operating in countries with weak legal protection for both minority shareholders and creditors.

However, because countries differ in the way they assure and prioritize legal protection to shareholders and debtholders, firms' ICFS may depend on whether and how countries enhance minority shareholder and creditors protection equally (or unequally; Deakin et al., 2017; Giofré, 2013; Rasheed & Yoshikawa, 2012). The intuition is that the capital market's legal institutions are in place to assure the collective supply of capital, where creditors, shareholders and firms interact to jointly provide the necessary input to foster economic growth. Consequently, countries face a potential trade-off between favoring the demand and/or the supply of capital when arranging their legal institutions as a system that coordinates the interests of different actors. Therefore, an institutional setting that provides strong protection for creditors and minority shareholders may not necessarily lead to better economic outcomes since it neglects one of the collective actors, namely, the firm. Accordingly, by providing too much protection to the supply side, country-level legal institutions empower external suppliers of capital by erecting barriers to the use of external funds. Thus, even though a supply of external capital is available, firms will look for alternative means to fund value-added projects, which, in turn, increases ICFS.

Extant research provides evidence that strong creditor protection can introduce negative effects on firm investment behavior since it can discourage risk-averse managers from using external financing to avoid either increased outside monitoring or the risk of losing control in case of bankruptcy (e.g., inefficient liquidation and dismissal of management; see Acharya, Sundaram, & John, 2011; Cho et al., 2014; Deakin et al., 2017; Vig, 2013). Acharya, Amihud, & Litov (2011), Cho et al. (2014) and Vig (2013) suggest that firms are reluctant to issue debt in the face of strong creditor protection because when creditors are powerful, they could prematurely seize the assets of defaulting firms. Therefore, firms react by reducing leverage to avoid the likelihood of default. This literature implies that strong creditor rights induce firms to prefer internal funds over debt financing. Consequently, investment becomes more sensitive to internal cash flow in countries with strong creditor protection.

Deakin et al. (2017) examine several dimensions of creditor protection and demonstrate that strengthening certain dimensions can be negative for debt market growth. More so, such effect tends to be stronger in developed economies, where shareholder protection tends to be higher when compared to emerging economies (see La Porta et al., 2000). In other words, their evidence suggests that not only the supply side of a country's external financing affect firm investment behavior but also, and perhaps more importantly, management preferences and the choice of the optimal financing mix. Indeed, Rajan and Zingales (1995) are among the first to have proposed the logic of a regulatory trade-off, where countries must balance the property rights of different stakeholders, such as suppliers of capital

(supply side) and managers (demand side). These authors use bankruptcy law to show the extent to which liquidation is emphasized over the renegotiation of claims and the degree to which management can control the bankruptcy process. Their evidence suggests that in the United States, bankruptcy law limits creditor protection, giving management substantial decision power, including the ability to propose a reorganization plan. In contrast, the enforcement of minority shareholder protection in the United States increases public participation in the stock market, unbalancing the legal protection of creditors and minority shareholders.

In addition, legal provisions that require the filing of detailed financial accounts and that impose stringent requirements for material disclosure will improve the scrutiny of firm internal resources and increase the costs of cash flow diversion (Aslan & Kumar, 2012; Djankov et al., 2008), thereby enhancing the protection of minority shareholders. There is, however, substantial heterogeneity across countries in terms of financial disclosure regimes (Biddle et al., 2009), legal enforcement, bankruptcy codes (Aerts et al., 2013) and the extent to which bankruptcy codes favor managers and shareholders vis-à-vis creditors (Deakin et al., 2017; Qi et al., 2017). Evidence also exists that laws intended to enforce the protection of suppliers of capital accomplish this in different and complementary ways, such as by protecting minority shareholders from controlling shareholders and entrenched managers and/or by protecting creditors by either enforcing credit contracts or insolvency procedures (Acharya, Sundaram, & John, 2011; Deakin et al., 2017).

What this prior research suggests is that by combining strong minority shareholder and creditors protection, countries impose greater external monitoring, reducing managerial discretion and increasing private costs, which in turn may lead risk-averse managers to reduce corporate risk-taking or avoid external finance, ultimately increasing ICFS. We, therefore, hypothesize that strengthening both minority shareholder and creditors protection can lead to institutional *crowding out* (Bowles, 2004), which implies that a legal institution that protects one source of capital may reduce the effectiveness of other legal institutions.

Hypothesis 2: Firms operating in countries combining strong legal protection for both suppliers of capital—strong minority shareholder protection and strong creditor protection—exhibit higher ICFS than firms operating in countries with strong legal protection for at least one supplier of capital.

3 | METHODS

3.1 | Sample

To test our hypotheses, we draw our sample from the 30 countries included in the Centre for Business Research (CBR) Extended Shareholder and Creditor Protection Indices collected by the CBR of the University of Cambridge (Armour et al., 2016). We identify all publicly listed firms whose firm-level financial and ownership data are available in the Bureau van Dijk's Osiris database between 2010 and 2019. Our data collection starts in 2010 to avoid overlap with the financial crisis of 2007–2009, which had a potentially adverse effect on the supply of capital, affecting firms' ability to raise external capital (Duchin et al., 2010). Similarly, our collection stops in 2019 to avoid the adverse shock of the Coronavirus disease (COVID-19) crisis on international trade and thus firm valuation (Ramelli & Wagner, 2020).[2]

We collect financial and ownership data for all firms operating in the manufacturing sector (Standard Industrial Classification codes 2000–3999). We then exclude firms with negative or missing data on total assets and gross sales. Consistent with Almeida and Campello (2007), we exclude firms whose growth in either total assets or gross sales is above 100% (i.e., firms that could have gone through significant mergers and acquisitions or reorganizations) and with a negative Tobin's Q or above 10 (suggestive of measurement errors). Moreover, we exclude firms with negative or missing tangible fixed assets (i.e., net property, plant and equipment). Our final sample comprises 54,541 firm-year observations from 21 countries. Due to the use of lagged values in some of our variables and sample definition, our

[2] We also estimated our models including 2020 data in our sample and found similar results. The results are available from the authors upon request.

final sample contains the period 2012–2019. To alleviate the effect of extreme observations, we winsorize financial variables at the first and 99th percentiles.

3.2 | Variables measurement

We use the CBR database to measure minority shareholder and creditor protection for the countries in our sample (for a detailed description of the data, see Armour et al., 2016).[3] By constructing a time series of minority shareholder and creditor protection comprising several legal provisions, this dataset is a significant improvement over prior investor protection indices that rely on cross-sectional institutional variables (La Porta et al., 2000; Martins et al., 2019; Spamann, 2010). In addition, by separating provisions protecting minority shareholders' interests from those protecting creditors, this dataset allows us to explore how different country-level combinations of investor protection affect firm-level investment decisions. We classify countries in our sample into low and high levels of protection using the median value of each index (minority shareholder and creditor protection) as a threshold. First, we calculate the average score of minority shareholder and creditor protection for each country in our sample for the years 2010–2013. Then, for each investor protection index, we calculate the median value of these averages to split our sample into a low or high level of investor protection if the country is below or above the median, respectively. Putting together the low and high levels of minority shareholder and creditor protection gives us four quadrants (hereafter subsamples), as follows: (1) low shareholder–low creditor (LSLC) protection, (2) low shareholder–high creditor (LSHC) protection, (3) high shareholder–low creditor (HSLC) protection and (4) high shareholder–high creditor protection (HSHC), which compose our four subsamples.

Following the ICFS literature (Arslan et al., 2006; Becker & Sivadasan, 2010; Kuo & Hung, 2012; Lewellen & Lewellen, 2016; Pindado et al., 2011), our dependent variable, *Investment*, is the change in fixed assets as measured by the net property, plant and equipment plus depreciation and amortization expenses scaled by total assets at the beginning of the year. For robustness, we measure *Investment (alternative)* as the variation in property, plant and equipment plus research and development (R&D) expenses scaled by total assets at the beginning of the year. Similar to Andrén and Jankensgård (2020) we measure *Cash flow* by net income plus depreciation and amortization expenses.[4] We scale both *Investment* and *Cash flow* by total assets at the beginning of the year. We also include *Tobin's Q*, measured as market capitalization plus net debt over total assets, and *Size*, measured as the natural logarithm of gross sales. Table 1 presents the descriptive statistics for these variables using the entropy-balanced samples, which we discuss in the next section.

3.3 | Entropy balancing

One potential concern in our analysis of the full sample of 54,541 firm-year observations across 21 countries is the possible presence of confounding factors among firms, leading to selection bias. More specifically, due to unobserved characteristics, firms within one given subsample are likely to differ from firms in other subsamples. This unobserved heterogeneity could bias our estimates. Indeed, Table 2 suggests that firms classified among the four subsamples—LSLC, LSHC, HSLC and HSHC—are significantly different in terms of *Size*, confirming this is a potential bias.

[3] A detailed description of the items that comprise the CBR Extended Shareholder and Creditor Protection Indices are omitted here because of space concerns and are available from the authors upon request.

[4] Recently, Andrén and Jankensgård (2020) stressed the conjecture that, in the past few years, earnings have become a poorer proxy for cash flows from operations due to the increased use of accruals, possibly leading to measurement errors in earnings-based proxies. Their results showed that, in fact, the cash effectiveness of earnings has increased in a sample of US large manufacturing firms and shows convergence in the coefficient of variation for sensitivities across the five cash flow measures examined, in the period post-2000 (2000 to 2014). Since we use a cross-country sample and focus on the combined effect of investor protection on ICFS, we adopted a more standard proxy for cash flow.

TABLE 1 Variables definitions and descriptive statistics (full sample–after entropy balancing)

Variable	Description	Minimum	Mean	Median	Maximum	S.D.	*N*
Investment	(ΔNet Property, Plant & Equipment + Dep. & Amort) ÷ Lagged Total Assets	−0.132	0.047	0.035	0.337	0.067	54,541
Investment (alternative)	(ΔNet Property, Plant & Equipment + Dep. & Amort + R&D) ÷ Lagged Total Assets	−0.129	0.067	0.048	0.454	0.086	54,541
Cash flow	(Net Income + Dep. & Amort.) ÷ Lagged Total Assets	−0.523	0.066	0.073	0.311	0.106	54,541
Tobin's Q	(Market Capitalization + Net Debt) ÷ Total Assets	0.069	1.206	0.830	6.615	1.135	54,541
Size	Natural Logarithm of Gross Sales	5.275	12.325	12.293	17.371	1.766	54,541

Note: All financial variables are winsorized at the 1st and 99th percentiles.

TABLE 2 Descriptive statistics before and after balancing between subsamples

	Mean "treated" (1)	Mean "Control" *Before balancing* (2)	Mean "Control" *After balancing* (3)	Mean Diff. *Before balancing* (1)–(2)	Mean Diff. *After balancing* (1)–(3)	Mean Diff. *t*-stat *Before balancing* (1)–(2)	Mean diff. *t*-stat *After balancing* (1)–(3)
Panel A. "Treated": HSHC versus "Control": LSLC							
Size	12.325	10.877	12.325	1.448	0.000	65.690	0.000
Size × $year_{2013}$	1.268	1.272	1.268	−0.003	0.000	−0.082	0.000
Size×$year_{2014}$	1.357	1.301	1.357	0.056	0.000	1.371	0.000
Size×$year_{2015}$	1.424	1.369	1.424	0.055	0.000	1.313	0.000
Size×$year_{2016}$	1.573	1.391	1.573	0.182	0.000	4.270	0.000
Size×$year_{2017}$	1.643	1.398	1.643	0.245	0.000	5.688	0.000
Size×$year_{2018}$	1.870	1.437	1.870	0.432	0.000	9.675	0.000
Size×$year_{2019}$	2.046	1.470	2.046	0.576	0.000	12.592	0.000
Panel B. "Treated": HSHC versus "Control": LSHC							
Size	12.325	12.219	12.325	0.106	0.000	2.002	0.010
Size×$year_{2013}$	1.268	1.370	1.268	−0.102	0.000	−1.276	0.001
Size×$year_{2014}$	1.357	1.442	1.357	−0.085	0.000	−1.043	0.001
Size×$year_{2015}$	1.424	1.470	1.424	−0.046	0.000	−0.562	0.001
Size×$year_{2016}$	1.573	1.554	1.573	0.018	0.000	0.218	0.001
Size×$year_{2017}$	1.643	1.597	1.643	0.046	0.000	0.539	0.001
Size×$year_{2018}$	1.870	1.687	1.870	0.183	0.000	2.095	0.001
Size×$year_{2019}$	2.046	1.775	2.046	0.271	0.000	3.045	0.000

(Continues)

TABLE 2 (Continued)

	Mean "treated" (1)	Mean "Control" *Before balancing* (2)	Mean "Control" *After balancing* (3)	Mean Diff. *Before balancing* (1)–(2)	Mean Diff. *After balancing* (1)–(3)	Mean Diff. *t*-stat *Before balancing* (1)–(2)	Mean diff. *t*-stat *After balancing* (1)–(3)
Panel C. "Treated": HSHC versus "Control": HSLC							
Size	12.325	13.151	12.326	−0.825	−0.001	−42.747	−0.040
$Size \times year_{2013}$	1.145	1.514	1.145	−0.370	0.000	−8.892	−0.012
$Size \times year_{2014}$	1.357	1.593	1.357	−0.236	0.000	−5.439	−0.003
$Size \times year_{2015}$	1.424	1.613	1.424	−0.189	0.000	−4.301	−0.001
$Size \times year_{2016}$	1.573	1.651	1.573	−0.078	0.000	−1.736	0.000
$Size \times year_{2017}$	1.643	1.708	1.643	−0.065	0.000	−1.422	−0.002
$Size \times year_{2018}$	1.870	1.746	1.870	0.123	0.000	2.613	0.002
$Size \times year_{2019}$	2.046	1.773	2.046	0.273	0.000	5.658	0.003

Note: Size is the natural logarithm of gross sales. All financial variables are winsorized at the 1st and 99th percentiles.

To mitigate this potential selection bias, we create balanced samples using the entropy balancing approach (Hainmueller, 2012; Hainmueller & Xu, 2013). The main advantage of this approach is that it balances the moments of the distributions of the treatment group's covariates with the moments of those covariates from the control group. Entropy balancing is a reweighting scheme to exactly balance the first and possibly higher moments of the covariate distributions in a reweighted control group and the treatment group. Accordingly, this approach alleviates covariate imbalance between treatment and control subsamples more efficiently while having the advantage of allowing weights for virtually all observations, which minimizes data discarding (Hainmueller, 2012).

Using the entropy balancing approach, our strategy is to balance the covariates' moments of firms from one subsample with those from the other subsamples. Since our main argument concerns the overregulation hypothesis (as stated in hypothesis 2) and we have four subsamples, we deploy a sequence of three balancing schemes using the subsample where shareholder and creditor protection are both high (i.e., HSHC) as the treatment group (using the remaining subsamples, i.e., LSLC, LSHC and HSLC,as control groups). We begin by balancing firms between the HSHC subsample and the subsample where both levels of protection are low (i.e., LSLC), followed by balancing firms from the HSHC subsample with firms from the LSHC subsample. The third step in this sequence is to balance firms from the HSHC subsample with firms from the HSLC subsample. This sequence of balancing allows us to reweight the observations in the control groups to balance with those in the treatment group. Because our data have a panel structure, this sequence of steps is implemented yearly[5] (Greenaway et al., 2005; Heyman et al., 2007; Martins et al., 2019). Following previous literature (Drobetz et al., 2019), we use the lagged value of firm size, *Size*, as the covariate. In robustness tests, we increase the list of covariates by including the lagged values of *Cash flow* and *Tobin's Q* and find similar results. Finally, we balance the three first moments—the mean, standard deviation and skewness—of the covariates.

The three panels of Table 2 show the descriptive statistics before and after the entropy balancing approach. While the mean differences in *Size* across subsamples and years are statistically significant in most cases before balancing, after balancing they are not significant, primarily due to the exact balancing nature of the entropy approach. This result suggests that the distributions of *Size* are similar among subsamples and thus comparable.

3.4 | Empirical model

To examine how different degrees of country-level investor protection affect ICFS, we estimate the following empirical model for each subsample after balancing by *Size*, an unconstrained model that allows the intercepts and slope coefficients to differ freely across subsamples:

$$\frac{I_{i,t}}{TA_{i,t-1}} = \beta_1 + \beta_2\left(\frac{CF_{i,t}}{TA_{i,t-1}}\right)_{i,t} + \beta_3 Tobin's\ Q_{t-1} + \beta_4 Size_{t-1} + \eta_i + \psi_t + \omega_c \times \psi_t + \varphi_i \times \psi_t + \varepsilon_{it}. \quad (1)$$

Therefore, we test whether β_2 in equation (1) is significantly different across all subsamples, where $I_{i,t}$ is *Investment*, $TA_{it\text{-}1}$ is total assets at the beginning of the year and $CF_{i,t}$ is *Cash flow*. Following the literature on ICFS (Fazzari et al., 1988; Kaplan & Zingales, 1997; Larkin et al., 2018; McLean et al., 2012; Moshirian et al., 2017), we include *Tobin's Q* as an explanatory variable. We also control for *Size* to account for the fact that larger firms have easier access to external capital (Almeida & Campello, 2007). Standard errors are clustered at the firm level (Petersen, 2009).

We include firm fixed effects (η_i) to control for any unobservable effects at the firm level and year fixed effects (ψ_t) to control for common shocks in investments that vary over time (McLean et al., 2012). Additionally, we include interactions between year and country fixed effects ($\psi_t \times \omega_c$) and industry fixed effects($\psi_t \times \varphi_i$). These terms are included to control for any shock in firm investment that might occur in specific countries or industries over the sample period. For example, if there is an increase or decrease in investment levels in a specific country or industry unrelated to

[5] We use interaction terms between *Size* and all years. For more details, see Hainmueller and Xu (2013).

corporate cash flow, these controls capture this investment trend. This procedure helps us tease out ICFS not only from investment sensitivity to time-variant factors in any country or industry but also from time-invariant firm-level characteristics.

4 | DESCRIPTIVE STATISTICS

Table 3 presents the mean values per country for the main variables used in our estimations. Note the significant variance in *Investment* across countries. For example, while the average investment in fixed assets in Brazil is 1% of total assets, firms in Lithuania invested around 10% in our sample period. There is also a wide variance in *Cash flow*, ranging from an average of 1% of total assets in the United States to 14% in Lithuania. The mean of *Tobin's Q* ranges from 0.590 in Latvia to 1.636 in the United States, while *Size* ranges from 10.620 in Latvia to 13.815 in Switzerland (gross sales of 40,946 and 999,490 thousand US dollars, respectively).

Table 4 shows pairwise correlations. We observe that the correlations are significant but small for most variables, except those between the *Investment* measures since they are alternative proxies for the same decision. We also observe that the correlation between the indices measuring country-level minority shareholder and creditor protection is not strong (0.454), which supports our argument that some countries do provide a different level of protection for different suppliers of capital. Table 4 suggests we should not be concerned about multicollinearity in our empirical estimations.

5 | EMPIRICAL RESULTS

5.1 | Baseline results

Table 5 reports the results from our estimations of equation (1) for several subsamples according to country-level minority shareholder and creditor protection. We use standard errors clustered by firm throughout the estimations (Petersen, 2009). ICFS is positive and significant in the full sample and across all subsamples. These results confirm previous evidence and suggest that, on average, internal cash flow availability explains the level of investment beyond its correlation with investment opportunities (Francis et al., 2013; Kuo & Hung, 2012; Pindado et al., 2011). After implementing the entropy balancing approach, we can compare cash flow coefficients (β_2) across different columns in Table 5, controlling for unobserved firm heterogeneity across the four subsamples.

The ICFS in the full sample is 0.099 (Table 5, Column 1). Overall, a dollar of prior-year cash flow is associated with $0.10 of additional investment for an average firm in the full sample. The highest ICFS is 0.166 (Table 5, Column 6), in the LSLC subsample, where both suppliers of capital have below-median protection, while the lowest ICFS is 0.061 (Table 5, Column 7) in the LSHC subsample.

Comparing the subsamples of firms from countries with low and high minority shareholder protection, we observe that the sensitivity changes very slightly from 0.109 (Table 5, Column 2) to 0.089 (Table 5, Column 3). Comparing the subsamples of firms from countries with low and high creditor protection, we observe a more substantive change: the sensitivity decreases from 0.114 (Table 5, Column 4) to 0.082 (Table 5, Column 5). In other words, strengthening minority shareholder protection or creditor protection alone seems to decrease ICFS. Note that these results do not account for differences within countries regarding the combined effect of the strength of both minority shareholder and creditor protection.

To test our argument about the effect of overregulation on ICFS, we compare Columns 6 to 9 in Table 5. First, following hypothesis 1, we test whether ICFS in countries where either minority shareholder or creditor protection is high (i.e., LSHC and HSLC) differs from countries where both minority shareholder and creditor protection are low (LSLC). Our results show that increasing protection for either minority shareholders (HSLC) or creditors (LSHC) is

TABLE 3 Descriptive statistics after entropy balancing (average values for all variables)

Country	Average creditor protection (2010–2013)	Average shareholder protection (2010–2013)	Investment	Investment (alternative)	Cash flow	Tobin's Q	Size	Obs.	Subsample
Belgium	6.785	5.660	0.064	0.106	0.044	1.338	12.027	288	High shareholder–low creditor (HSLC)
Brazil	5.875	4.980	0.010	0.011	0.042	0.832	13.426	615	Low shareholder–low creditor (LSLC)
Canada	6.750	6.500	0.064	0.085	0.059	1.104	12.893	732	High shareholder–high creditor protection (HSHC)
China	7.850	6.725	0.054	0.056	0.068	1.458	12.588	12,239	HSHC
France	7.725	6.500	0.045	0.063	0.041	1.007	12.251	1,412	HSHC
Germany	6.500	6.760	0.060	0.091	0.077	1.116	12.425	1,462	Low shareholder–high creditor (LSHC)
India	6.300	5.630	0.034	0.038	0.069	1.323	11.992	11,695	LSLC
Japan	7.300	6.400	0.036	0.056	0.065	0.648	12.385	10,500	HSLC
Latvia	6.000	6.500	0.065	0.068	0.087	0.590	10.620	73	LSHC
Lithuania	6.250	5.750	0.102	0.104	0.139	0.978	11.764	58	LSLC
Malaysia	7.500	6.910	0.032	0.034	0.061	0.792	10.981	2,419	HSHC
The Netherlands	6.500	6.425	0.060	0.085	0.100	1.222	13.110	301	LSHC
Poland	6.160	6.260	0.058	0.059	0.086	0.986	12.076	949	LSLC

(Continues)

TABLE 3 (Continued)

Country	Average creditor protection (2010–2013)	Average shareholder protection (2010–2013)	Investment	Investment (alternative)	Cash flow	Tobin's Q	Size	Obs.	Subsample
Russia	7.850	4.320	0.035	0.037	0.057	0.786	12.268	390	HSLC
South Africa	6.159	5.320	0.036	0.038	0.092	1.040	13.537	273	LSLC
Spain	6.660	6.440	0.041	0.048	0.065	1.192	12.652	323	HSHC
Sweden	6.500	6.860	0.058	0.081	0.080	1.481	12.041	1,017	LSHC
Switzerland	5.500	6.290	0.051	0.084	0.100	1.471	13.815	712	LSLC
Turkey	6.285	6.143	0.025	0.029	0.083	1.066	12.461	1,012	LSLC
UK	7.400	7.490	0.064	0.096	0.066	1.455	12.091	1,622	HSHC
USA	7.188	6.000	0.056	0.127	0.014	1.636	12.241	6,449	HSLC
Total	6.716	6.184	0.047	0.067	0.066	1.206	12.325	**54,541**	

Note: Investment is the variation in plant, property and equipment over lagged total assets. *Investment (alternative)* is the variation in plant, property and equipment plus the variation of inventory plus research and development (R&D) expenses over lagged total assets. *Cash flow* is net income plus depreciation and amortization scaled by total assets at the beginning of the year. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All financial variables are winsorized at the 1st and 99th percentiles.

TABLE 4 Pairwise correlation matrix

	1	2	3	4	5	6	7
1 Investment	1.000						
2 Investment (alternative)	0.800***	1.000					
3 Cash flow	0.164***	−0.080***	1.000				
4 Tobin's Q	0.105***	0.177***	0.089***	1.000			
5 Size	0.065***	−0.040***	0.298***	−0.050***	1.000		
6 Shareholder Protection	0.045***	0.031***	−0.051***	0.003	−0.011	1.000	
7 Creditor Protection	0.188***	0.157***	0.033***	−0.006	−0.012	0.454***	1.000

Note: *Investment* is the variation in plant, property and equipment over lagged total assets. *Investment (alternative)* is the variation in plant, property and equipment plus the variation of inventory plus R&D expenses scaled by total assets at the beginning of the year. *Cash flow* is net income plus depreciation and amortization scaled by total assets at the beginning of the year. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails.
$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

TABLE 5 Country institutions and investment-cash flow sensitivity (ICFS)–entropy balancing per subsamples

	Full	Low Shar	High Shar	Low Cred	High Cred	LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Cash flow	0.099	0.109	0.089	0.114	0.082	0.166	0.061	0.068	0.117
	[9.135]	[6.071]	[8.299]	[9.697]	[4.578]	[9.212]	[2.146]	[4.845]	[7.464]
Tobin's Q	0.004	0.004	0.004	0.007	0.002	0.007	0.001	0.006	0.002
	[4.886]	[2.449]	[4.932]	[6.365]	[1.495]	[4.254]	[0.294]	[4.509]	[2.541]
Size	−0.004	−0.007	−0.002	−0.006	−0.003	−0.007	−0.007	−0.004	−0.002
	[−2.230]	[−2.137]	[−1.124]	[−2.681]	[−1.242]	[−2.539]	[−0.864]	[−1.245]	[−0.882]
Constant	0.092	0.141	0.058	0.082	0.137	0.076	0.199	0.083	0.080
	[3.126]	[2.948]	[2.037]	[2.553]	[3.455]	[2.010]	[1.939]	[1.760]	[2.655]
Observations	54,541	18,167	36,374	32,941	21,600	15,314	2,853	17,627	18,747
Adjusted R^2	0.335	0.334	0.341	0.318	0.337	0.260	0.385	0.404	0.294

Note: t-statistics in brackets. The dependent variable is *Investment*, which is the variation in plant, property and equipment plus the variation of Inventory scaled by total assets at the beginning of the year. *Cash flow* is net income plus depreciation and amortization scaled by total assets at the beginning of the year. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails. Standard errors are clustered by firm. All models contain firm fixed effects, year effects, country fixed effects interacted with year fixed effects and industry fixed effects interacted with year effects. Independent control variables are lagged for 1 year. Firms are matched between subsamples, each year, using the values of lagged *Size* as a covariate.

associated with a significant decline in firm ICFS. More specifically, a dollar of prior-year cash flow is associated with $0.17 of additional investment for firms in the LSLC subsample and $0.06 ($0.07) of additional investment for firms in countries in the LSHC (HSLC) subsample, a 65% (59%) reduction. This evidence supports the predictions of hypothesis 1.

In Table 5, Column 9, we estimate ICFS for countries where both suppliers of capital have above-median protection (HSHC) and show that the coefficient is 0.117 and significant. That is, in countries with strong levels of both minority shareholder and creditor protection, ICFS increases, and cash flow is associated with $0.12 of additional investment. This is a 100% (71%) increase in firm ICFS for countries that strengthen legal provisions to protect one of the main sources of capital instead of both, that is, LSHC and HSLC. This evidence supports the predictions of hypothesis 2.

Examining Table 5 further, we observe that the subsamples of firms operating in countries assuring unbalanced protection (LSHC and HSLC) are those with the lowest ICFS coefficients. In fact, Columns 7 and 8 contain the lowest ICFS coefficients throughout Table 5. When we calculate the difference between the *Cash flow* coefficients in the subsamples with unbalanced protection (i.e., 0.061 and 0.068 in Columns 7 and 8, respectively), we find a *z*-score of 0.221, not significant at usual levels. This evidence suggests that strengthening either minority shareholder or creditor protection seems to decrease ICFS to a similar amount.

In Table 6, we show the *z*-scores of the differences among the *Cash flow* estimated coefficients in the subsamples. Table 6, Column 1, shows the *z*-scores of the differences between the coefficients reported in Table 5. In Table 6, Column 1, Row 1, the difference between the *Cash flow* coefficient in LSHC (i.e., 0.061 in Column 7 of Table 5) and the coefficient in LSLC (i.e., 0.166 in Column 6 of Table 5) has a *z*-score of −3.109, which is significant at the usual levels. Similarly, in Row 2 of Table 6, the difference between the *Cash flow* coefficient in HSLC (i.e., 0.068 in Column 8 of Table 5) and the coefficient in LSLC (i.e., 0.166 in Column 6 of Table 5) has a *z*-score of −4.278, which is also significant at the usual levels. The results in Table 6, Column 1, Rows 1 and 2, are qualitatively the same as those presented in Table 5 and support the predictions of hypothesis 1.

When we move from countries with unbalanced protection to countries combining high protection for both minority shareholders and creditors, we observe that the differences in the *Cash flow* coefficients have large *z*-scores. Specifically, Row 3 of Table 6 shows that the *Cash flow* coefficient in HSHC (i.e., 0.117 in Column 9 of Table 5) minus the coefficient in LSHC (i.e., 0.061 in Column 7 of Table 5) has a *z*-score of 1.720, while Row 4 of Table 6 shows that the same coefficient minus the coefficient in HSLC (i.e., 0.068 in Column 8 of Table 5) has a *z*-score of 2.323. Both differences are statistically significant and support the predictions of hypothesis 2.

In the remaining columns of Table 6 (Columns 2–10), we anticipate the *z*-scores of the differences in ICFS across subsamples for alternative explanations and to determine the robustness of our baseline results in Table 5. Overall, we present strong evidence corroborating our argument on the adverse effect of overregulation as formally presented in hypothesis 2. Next, we discuss these robustness tests in further detail.

5.2 | Different matching covariates

First, we explore an alternative set of covariates to balance firms across subsamples. Alongside lagged values of *Size*, we include lagged values of *Cash flow* and *Tobin's Q* as covariates and repeat the balancing by year. Expanding the number of covariates by which subsamples are balanced increases the moment conditions that lead to more constrained balancing weights. After estimating equation (1) in this new matched sample, we observe the same patterns as in Table 5. Table 7 shows that moving from LSLC to either of the two subsamples with unbalanced protection leads to a statistically significant decrease in ICFS while moving from the same two subsamples to the HSHC subsample increases ICFS. The results in Table 6, Column 2, show the differences in the *z*-scores of this test and that hypotheses 1 and 2 are both supported.

TABLE 6 Differences in ICFS across quadrants for several subsamples and models

	Difference in cash flow betas between subsamples	Hypotheses	Expected coefficient sign	Main table	Different balancing covariates	Financial constraints	Asset tangibility	Dep. Var.: *Investment (alternative)*	Non-negative cash Flow	Controlling shareholder	Measurement error in Tobin's Q	Country-level control Variables	Period 2014–2019
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	LSHC–LSLC	H1	Negative	**−3.109**	**−2.449**	**−2.934**	**−2.137**	**−2.934**	**−2.934**	**−1.962**	**−2.482**	**−2.818**	**−1.617**
(2)	HSLC–LSLC	H1	Negative	**−4.278**	**−2.872**	**−3.570**	**−2.774**	**−5.810**	**−3.760**	**−2.575**	**−3.217**	**−4.263**	**−3.297**
(3)	HSHC–LSHC	H2	Positive	**1.720**	**1.400**	1.087	0.440	**1.628**	**1.740**	**1.224**	**1.402**	**1.308**	0.770
(4)	HSHC–HSLC	H2	Positive	**2.323**	**1.401**	0.857	0.157	**4.067**	**2.246**	**1.637**	**1.688**	**2.084**	**2.245**

Note: The *z*-score of the difference between the coefficients (b_1 and b_2) is measured following Paternoster et al.'s (1998, p.862) eq. 4 ($z = (b_1 - b_2)/\sqrt{SEb_1{}^2 + SEb_2{}^2}$). A *z*-score higher than 1.2 (or lower than −1.2) is significant at the 10% threshold (bold values).

TABLE 7 Country Institutions and ICFS–entropy balancing per subsamples – different balancing covariates

	Full	Low Shar	High Shar	Low Cred	High Cred	LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Cash flow	0.103	0.108	0.099	0.120	0.085	0.157	0.068	0.085	0.117
	[8.624]	[5.685]	[8.339]	[9.432]	[4.386]	[8.450]	[2.201]	[4.987]	[7.464]
Tobin's Q	0.004	0.003	0.004	0.006	0.001	0.006	0.000	0.006	0.002
	[3.740]	[1.652]	[3.892]	[4.591]	[1.081]	[3.897]	[0.021]	[3.029]	[2.541]
Size	−0.004	−0.008	−0.001	−0.004	−0.005	−0.005	−0.011	−0.002	−0.002
	[−1.912]	[−2.127]	[−0.583]	[−1.414]	[−1.642]	[−1.788]	[−1.385]	[−0.365]	[−0.882]
Constant	0.092	0.151	0.049	0.055	0.159	0.051	0.272	0.051	0.080
	[2.767]	[2.891]	[1.520]	[1.452]	[3.719]	[1.246]	[2.469]	[0.816]	[2.655]
Observations	54,541	18,167	36,374	32,941	21,600	15,314	2,853	17,627	18,747
Adjusted R^2	0.335	0.333	0.343	0.329	0.334	0.262	0.387	0.409	0.294

Note: t-statistics in brackets. The dependent variable is *Investment*, which is the variation in plant, property and equipment plus the variation of Inventory over lagged total assets. *Cash flow* is net income plus depreciation and amortization over lagged total assets. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails. Standard errors are clustered by firm. All models contain firm fixed effects, year effects, country fixed effects interacted with year fixed effects, and industry fixed effects interacted with year effects. Independent control variables are lagged for 1 year. Firms are matched between quadrants, in each year, using the values of lagged *Size*, lagged *Cash flow* and lagged *Tobin's Q* as covariates.

5.3 | Financial constraints

To investigate whether our main results are driven by firms that can be considered financially constrained, we screen firms using the payout ratio and select only firms below the 50th percentile. Then we balance the covariate moments of firms across subsamples using the same sequence mentioned above. This criterion substantially decreases the number of weighted observations but allows us to understand whether ICFS changes across the subsamples, conditional on the level of firm financial constraints. Table 8, Panel A, presents the new estimates. Although the magnitude of the ICFS coefficient in the HSHC subsample is smaller (i.e., 0.076, while that in Table 5 is 0.117), we observe a similar pattern in the magnitude of ICFS as in our main results. In other words, the strongest two sensitivities come from the LSLC and HSHC subsamples, while the weakest two come from the subsample of countries with unbalanced protection. While the bottom two rows of Column 3 in Table 6 show that the *z*-scores are positive but no longer significant at usual levels, the top two rows show negative and significant *z*-scores, consistent with hypothesis 1.

5.4 | Asset tangibility

Moshirian et al. (2017) have recently examined ICFS levels across 41 countries and documented the important role of asset tangibility in explaining ICFS patterns. We thus examine whether our results are sensitive to omitting asset tangibility in our baseline model. To do so, we screen all firms using their tangibility ratios and select only firms below the 50th percentile to balance between subsamples. Andrén and Jankensgård (2020) use a similar approach and allow us to verify whether tangible assets help mitigate ICFS differences across the subsamples. Examining the new estimates in Table 8, Panel B, we observe that low levels of tangible assets substantially decrease the ICFS in all subsamples. However, again, we find that the strongest two levels of sensitivity come from the LSLC and HSHC subsamples, while the weakest two come from the subsample of countries with unbalanced protection, LSHC and HSLC. The top two rows of Column 4 in Table 6 show that the *z*-scores between LSLC and the subsamples with unbalanced protection are negative and significant at usual levels, consistent with hypothesis 1.

5.5 | Alternative measures for investment and cash flow

We also explore whether measurement problems in our variables of interest might be driving our main results. First, we use *Investment (alternative)* as the dependent variable. Its difference from *Investment* is that in *Investment (alternative)*, we include the allocation of capital in R&D expenses. The correlation with the original *Investment* variable is considerably below one (Table 4 shows that the correlation is 0.800), suggesting that our adjustment in this variable captures a different dimension of a firm's investment decision. Again, we find in Panel A of Table 9 that the two largest *Cash flow* coefficients come from the LSLC and HSHC subsamples and that both are larger than the *Cash flow* coefficients of countries assuring unbalanced protection to minority shareholders and creditors. Again, the results in Table 6, Column 5, show that the differences in the *z*-scores of this model support both hypotheses 1 and 2.

In addition to changing the measurement of *Investment*, we change the measurement of *Cash flow*, using only positive *Cash flow*. This is to mitigate the concerns discussed by Larkin et al. (2018) and Andrén and Jankensgård (2020) that firms with negative cash flow cannot invest properly, which might drive ICFS. In this new test, we select only the subsample of firms with cash flow greater than 5% of total assets at the beginning of the year and rematch them across subsamples. The results shown in Panel B of Table 9 are similar to our main results, and the results in Table 6, Column 6, show that all the *z*-scores corroborate previous findings and support the predictions of both hypotheses 1 and 2.

TABLE 8 Country Institutions and ICFS–matching per subsamples – financial constraints and asset tangibility

	Full	Low Shar	High Shar	Low Cred	High Cred	LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Panel A. Constrained firms (bottom 50th percentile of payout ratio)									
Cash flow	0.071	0.081	0.062	0.090	0.052	0.146	0.034	0.053	0.076
	[5.768]	[3.911]	[4.691]	[6.885]	[2.590]	[7.168]	[1.043]	[3.250]	[3.520]
Tobin's Q	0.005	0.005	0.004	0.006	0.003	0.006	0.003	0.005	0.003
	[4.081]	[2.568]	[3.248]	[4.201]	[1.784]	[2.639]	[0.749]	[3.021]	[1.631]
Size	−0.002	−0.004	−0.000	−0.003	−0.001	−0.004	−0.002	−0.002	0.000
	[−0.801]	[−0.968]	[−0.027]	[−1.079]	[−0.308]	[−1.120]	[−0.199]	[−0.430]	[0.067]
Constant	0.059	0.103	0.025	0.044	0.118	0.047	0.117	0.048	0.061
	[1.208]	[1.770]	[0.503]	[0.871]	[2.164]	[0.985]	[0.905]	[0.703]	[1.321]
Observations	27,267	11,189	16,078	17,467	9,800	9,895	1,294	7,572	8,506
Adjusted R^2	0.322	0.370	0.286	0.290	0.340	0.259	0.431	0.342	0.243

(Continues)

TABLE 8 (Continued)

	Full	Low Shar	High Shar	Low Cred	High Cred	LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Panel B. Low tangible firms (bottom 50th percentile of tangibility)									
Cash Flow	0.040	0.050	0.033	0.055	0.024	0.096	0.019	0.031	0.034
	[3.682]	[2.461]	[3.273]	[5.041]	[1.262]	[4.858]	[0.641]	[2.466]	[2.093]
Tobin's Q	0.002	0.002	0.002	0.003	0.001	0.004	0.000	0.002	0.001
	[2.242]	[1.124]	[2.373]	[2.970]	[0.849]	[2.247]	[0.045]	[2.036]	[1.257]
Size	−0.001	−0.000	−0.001	−0.001	−0.000	−0.003	0.004	−0.000	−0.001
	[−0.367]	[−0.129]	[−0.523]	[−0.790]	[−0.052]	[−1.392]	[0.582]	[−0.132]	[−0.563]
Constant	0.040	0.042	0.031	0.031	0.097	0.034	0.037	0.024	0.086
	[1.493]	[0.899]	[1.123]	[1.044]	[2.635]	[0.870]	[0.407]	[0.593]	[2.669]
Observations	27,271	7,746	19,525	15,406	11,865	5,890	1,856	9,516	10,009
Adjusted R^2	0.397	0.440	0.346	0.407	0.365	0.378	0.386	0.381	0.314

Note: t-statistics in brackets. The dependent variable is *Investment*, which is the variation in plant, property and equipment plus the variation of inventory over lagged total assets. *Cash flow* is net income plus depreciation and amortization over lagged total assets. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails. Standard errors are clustered by firm. All models contain firm fixed effects, year effects, country fixed effects interacted with year fixed effects, and industry fixed effects interacted with year effects. Independent control variables are lagged for 1 year. Firms are matched between quadrants, each year, using the values of lagged *Size* as a covariate.

TABLE 9 Country institutions and ICFS–matching per subsamples–alternative measures for investment and cash flow

	Full	Low Shar	High Shar	Low Cred	High Cred	Low Shar Low Cred (LSLC)	Low Shar High Cred (LSHC)	High Shar Low Cred (HSLC)	High Shar High Cred (HSHC)
	1	2	3	4	5	6	7	8	9
Panel A. Dependent variable: *Investment (alternative)*									
Cash flow	0.087	0.112	0.061	0.089	0.084	0.172	0.062	0.016	0.122
	[6.886]	[5.573]	[4.352]	[6.287]	[4.067]	[9.034]	[1.925]	[0.827]	[6.779]
Tobin's Q	0.006	0.005	0.006	0.010	0.003	0.008	0.002	0.011	0.004
	[5.669]	[2.654]	[5.827]	[6.951]	[1.874]	[4.537]	[0.601]	[5.379]	[3.202]
Size	−0.008	−0.011	−0.005	−0.011	−0.006	−0.009	−0.014	−0.016	−0.002
	[−3.421]	[−2.716]	[−2.267]	[−3.867]	[−1.777]	[−2.883]	[−1.452]	[−2.903]	[−0.902]
Constant	0.184	0.208	0.149	0.197	0.190	0.098	0.324	0.288	0.093
	[4.322]	[3.591]	[3.475]	[4.116]	[4.006]	[2.433]	[2.477]	[3.881]	[2.857]
Observations	54,541	18,167	36,374	32,941	21,600	15,314	2,853	17,627	18,747
Adjusted R^2	0.521	0.472	0.569	0.561	0.476	0.292	0.555	0.715	0.353

(Continues)

TABLE 9 (Continued)

Panel B. Firms with positive *Cash flow*									
	Full	Low Shar	High Shar	Low Cred	High Cred	Low Shar Low Cred (LSLC)	Low Shar High Cred (LSHC)	High Shar Low Cred (HSLC)	High Shar High Cred (HSHC)
	1	2	3	4	5	6	7	8	9
Cash flow	0.179	0.191	0.167	0.199	0.155	0.272	0.118	0.132	0.203
	[10.897]	[6.734]	[10.322]	[9.999]	[5.991]	[8.798]	[2.769]	[6.237]	[8.573]
Tobin's Q	0.003	0.003	0.003	0.006	−0.000	0.006	−0.002	0.007	0.002
	[2.498]	[1.239]	[3.244]	[4.595]	[−0.065]	[3.028]	[−0.615]	[3.775]	[1.312]
Size	−0.011	−0.025	−0.003	−0.019	−0.007	−0.033	−0.017	−0.006	v0.004
	[−3.435]	[−3.902]	[−1.079]	[−4.008]	[−1.653]	[−4.778]	[−1.469]	[−0.967]	[−1.082]
Constant	0.174	0.408	0.064	0.246	0.175	0.438	0.324	0.094	0.096
	[3.621]	[4.717]	[1.437]	[3.845]	[2.874]	[4.811]	[2.153]	[1.159]	[2.069]
Observations	35,262	10,596	24,666	21,074	14,188	8,600	1,996	12,474	12,192
Adjusted R^2	0.363	0.332	0.401	0.342	0.375	0.263	0.434	0.453	0.349

Note: t-statistics in brackets. The dependent variables are, respectively, *Investment (alternative)* is the variation in plant, property and equipment plus the variation of inventory plus R&D expenses over lagged total assets; and *Investment* is the variation in plant, property and equipment over lagged total assets. *Cash flow* is net income plus depreciation and amortization over lagged total assets. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails. Standard errors are clustered by firm. All models contain firm fixed effects, year effects, country fixed effects interacted with year fixed effects, and industry fixed effects interacted with year effects. Independent control variables are lagged for 1 year. Firms are matched between quadrants, each year, using the values of lagged *Size* as a covariate.

5.6 | Presence of a controlling shareholder

We also check whether the presence of controlling shareholders drives our main results. This investigation is based on extensive previous literature showing that these shareholders' preferences lead to agency conflicts and, ultimately, to the inability to obtain external funding from capital markets (Kuo & Hung, 2012; Pindado et al., 2011). To examine whether our results are robust to such a firm-level attribute, we select the subsample of firms whose largest shareholder holds more than 20% of firm outstanding shares, and we then rebalance the covariate moments of these firms across subsamples. The coefficients shown in Panel A of Table 10 corroborate our main results presented in Table 5 and suggest that ownership concentration does not drive our results. The results of Table 6, Column 7, show the differences in the *z*-scores of this model and again support the predictions of hypotheses 1 and 2.

5.7 | Measurement error in *Tobin's Q*

Erickson and Whited (2000) argue that measurement error in *Tobin's Q* biases ICFS and that when correcting for this, US firms no longer present a positive relation between investment and cash flow. Thus, if the levels of disclosure and transparency increase when investor protection increases, the inclusion of *Tobin's Q* might affect the ICFS that we observe. To mitigate this concern, we substitute *Tobin's Q* with firm *Sales growth* since the literature suggests that growth of sales is an alternative proxy for growth opportunities (Castro et al., 2015). The results in Table 6, Column 8 (and in Table 10, Panel B), show that, while an increase in either minority shareholder or creditor protection reduces ICFS, when countries combine high protection for both minority shareholders and creditors, ICFS increases. This result confirms those of Table 5 and suggests that the potential measurement error in *Tobin's Q* does not drive our main results.

5.8 | Additional country-level controls

We are concerned that other country-level factors might also drive our main results. Indeed, the literature shows that a country's reliance on either bank or market financing (Castro et al., 2015; Ergungor, 2004; Levine, 2002), as well as economic and financial development (Larkin et al., 2018) or legal origins (La Porta et al., 1997), may affect ICFS. To account for potential country-level confounding factors, we include country fixed effects interacted with year fixed effects in all previous models. In this section, we include additional interactions between a common law dummy and year fixed effects, the interactions of an emerging economy dummy with year fixed effects and the ratio of a country's debt to stock market capitalization. The results in Table 6, Column 9 (and Table 11), are qualitatively similar to those of our baseline model and these new estimates support hypotheses 1 and 2.

5.9 | Subperiod analysis

As discussed in Section 3, we rely on the minority shareholder and creditor protection indices provided by the CBR database. Despite the advantage of offering time-series indices for both types of capital suppliers, the CBR database does not provide updated indices after 2013. Because of this limitation, we use the values from 2010 to 2013 to create the four subsamples in our study. To verify whether this data limitation drives our results, in this section, we estimate equation (1), but only using the period 2014 to 2019. Table 12 presents the new estimates. The main findings of Table 5 persist since the dominant *Cash flow* coefficients come from the LSLC and the HSHC subsamples. Table 6, Column 10, shows the differences in the *z*-scores when we estimate this model.

TABLE 10 Country institutions and ICFS–matching per subsamples–controlling shareholder and measurement error in Tobin's Q

	Full	Low Shar	High Shar	Low Cred	High Cred				
						LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Panel A. Firms with one large shareholder holding more than 20% of shares									
Cash flow	0.105	0.115	0.095	0.118	0.089	0.157	0.071	0.076	0.122
	[7.481]	[5.016]	[6.556]	[7.150]	[3.967]	[6.587]	[1.950]	[3.751]	[6.443]
Tobin's Q	0.003	0.004	0.003	0.006	0.001	0.008	−0.001	0.004	0.002
	[3.549]	[1.913]	[3.202]	[4.837]	[0.924]	[4.263]	[−0.299]	[2.367]	[1.964]
Size	−0.005	−0.009	−0.002	−0.004	−0.006	−0.007	−0.011	−0.002	−0.003
	[−2.097]	[−2.048]	[−0.862]	[−1.288]	[−1.836]	[−1.530]	[−1.256]	[−0.292]	[−1.088]
Constant	0.102	0.170	0.057	0.064	0.177	0.070	0.265	0.052	0.098
	[3.145]	[2.809]	[1.805]	[1.500]	[3.886]	[1.221]	[2.267]	[0.799]	[2.744]
Observations	36,531	11,991	24,540	20,390	16,141	9,878	2,113	10,512	14,028
Adjusted R^2	0.345	0.329	0.365	0.332	0.349	0.262	0.388	0.438	0.314

(Continues)

TABLE 10 (Continued)

Panel B. Correcting potential Tobin's Q measuring error (using *Sales Growth* as a proxy for investment opportunities)									
	Full	Low Shar	High Shar	Low Cred	High Cred	LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Cash flow	0.104	0.111	0.093	0.119	0.086	0.156	0.062	0.078	0.112
	[9.538]	[5.938]	[9.116]	[9.398]	[4.844]	[7.519]	[1.971]	[5.995]	[7.130]
Sales Growth	0.008	0.010	0.006	0.006	0.009	0.006	0.015	0.004	0.006
	[3.080]	[2.175]	[2.492]	[1.804]	[2.460]	[1.358]	[1.570]	[1.151]	[2.028]
Ln(Total Assets)	−0.018	−0.030	−0.011	−0.025	−0.014	−0.032	−0.026	−0.017	−0.008
	[−8.079]	[−6.516]	[−4.932]	[−8.453]	[−4.257]	[−6.991]	[−3.057]	[−4.445]	[−3.085]
Constant	0.281	0.459	0.175	0.339	0.276	0.431	0.467	0.250	0.166
	[8.626]	[7.170]	[5.636]	[8.411]	[5.954]	[6.914]	[3.885]	[4.997]	[4.432]
Observations	54,541	18,167	36,374	32,941	21,600	15,314	2,853	17,627	18,747
Adjusted R^2	0.348	0.355	0.347	0.335	0.346	0.279	0.411	0.421	0.295

Note: t-statistics in brackets. The dependent variable is *Investment*, which is the variation in plant, property and equipment plus the variation of inventory over lagged total assets. *Cash flow* is net income plus depreciation and amortization over lagged total assets. *Tobin's Q* is market capitalization plus net debt over total assets. *Sales Growth* is the annual increase in gross sales. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails. Standard errors are clustered by firm. All models contain firm fixed effects, year effects, country fixed effects interacted with year fixed effects, and industry fixed effects interacted with year effects. Independent control variables are lagged for 1 year. Firms are matched between quadrants, each year, using the values of lagged *Size* as a covariate.

TABLE 11 Country institutions and ICFS–matching per subsamples–country-level control variables

	Full	Low Shar	High Shar	Low Cred	High Cred	LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Cash flow	0.116	0.120	0.098	0.129	0.093	0.173	0.074	0.075	0.118
	[10.267]	[6.418]	[9.249]	[10.776]	[4.967]	[9.383]	[2.511]	[5.438]	[7.519]
Tobin's Q	0.003	0.004	0.003	0.007	0.001	0.006	0.000	0.006	0.002
	[3.232]	[2.281]	[3.811]	[6.312]	[1.253]	[3.863]	[0.170]	[4.554]	[2.002]
Size	−0.009	−0.008	−0.006	−0.011	−0.004	−0.010	−0.006	−0.007	−0.003
	[−4.961]	[−2.504]	[−3.174]	[−4.860]	[−1.513]	[−3.335]	[−0.746]	[−1.940]	[−1.417]
Bank- vs Market-Based Economies	−0.014	−0.012	−0.008	−0.011	0.001	−0.015	−0.003	0.027	0.001
	[−7.232]	[−2.268]	[−3.149]	[−4.146]	[0.220]	[−1.905]	[−0.265]	[3.239]	[0.144]
Constant	0.148	0.159	0.087	0.126	0.118	0.117	0.187	0.053	0.069
	[6.364]	[3.566]	[3.780]	[4.416]	[3.056]	[3.174]	[1.804]	[1.150]	[2.389]
Dummy Common law times year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummy Emerging times year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,541	18,167	36,374	32,941	21,600	15,314	2,853	17,627	18,747
Adjusted R^2	0.295	0.311	0.320	0.282	0.323	0.235	0.369	0.383	0.288

Note: t-statistics in brackets. The dependent variable is *Investment*, which is the variation in plant, property and equipment plus the variation of Inventory over lagged total assets. *Cash flow* is net income plus depreciation and amortization over lagged total assets. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails. Standard errors are clustered by firm. All models contain firm fixed effects and year effects. Independent control variables are lagged for 1 year. Firms are matched between quadrants, each year, using the values of lagged *Size* as a covariate.

TABLE 12 Country institutions and ICFS–matching per subsamples–period 2014–2019

	Full	Low Shar	High Shar	Low Cred	High Cred	LSLC	LSHC	HSLC	HSHC
	1	2	3	4	5	6	7	8	9
Cash flow	0.109	0.125	0.092	0.112	0.105	0.158	0.096	0.067	0.125
	[8.829]	[6.370]	[7.018]	[7.882]	[5.214]	[7.471]	[3.011]	[3.734]	[6.724]
Tobin's Q	0.005	0.006	0.004	0.008	0.003	0.010	0.001	0.005	0.004
	[5.357]	[3.068]	[5.055]	[6.151]	[2.291]	[5.275]	[0.420]	[3.300]	[3.885]
Size	−0.006	−0.010	−0.004	−0.008	−0.005	−0.007	−0.009	−0.009	−0.003
	[−2.850]	[−2.267]	[−1.996]	[−2.805]	[−1.597]	[−2.002]	[−0.947]	[−1.999]	[−1.203]
Constant	0.073	0.128	0.048	0.074	0.102	0.061	0.131	0.100	0.058
	[2.266]	[2.174]	[1.565]	[1.932]	[2.311]	[1.208]	[1.071]	[1.777]	[1.710]
Observations	42,677	14,073	28,604	25,378	17,299	11,836	2,237	13,542	15,062
Adjusted R^2	0.356	0.365	0.351	0.325	0.378	0.271	0.442	0.399	0.317

Note: t-statistics in brackets. The dependent variable is *Investment*, which is the variation in plant, property and equipment plus the variation of inventory over lagged total assets. *Cash flow* is net income plus depreciation and amortization over lagged total assets. *Tobin's Q* is market capitalization plus net debt over total assets. *Size* is the natural logarithm of gross sales. All variables are winsorized at the 1% level in both tails. Standard errors are clustered by firm. All models contain firm fixed effects, year effects, country fixed effects interacted with year fixed effects, and industry fixed effects interacted with year effects. Independent control variables are lagged for 1 year. Firms are matched between quadrants, each year, using the values of lagged *Size* as a covariate.

5.10 | Interdependence and intertemporal effects

Our final robustness test concerns two criticisms of the single-equation model represented by equation (1): (a) the interdependence of financial decisions and (b) the intertemporal effects of alternative sources and uses of cash flow.[6] First, previous literature (Chang et al., 2014; Dasgupta et al., 2011; Drobetz et al., 2019; Gatchev et al., 2010) argues that financial decisions are interrelated since each time firms have a surplus of cash flow, they can increase investments, but they can also increase, for instance, cash holdings, dividend payments, pay back debt and buy back stocks. Therefore, ignoring the sources-equals-uses identity can lead to biased coefficients. Recognizing that a firm's cash flow is interdependent with other sources and uses, Chang et al. (2014) define the following accounting identity using flow-of-funds terms:

$$Cash\ \ flow_t = Inv_t + \Delta Cash_t + Div_t - \Delta Debt_t - \Delta Equity_t, \tag{2}$$

where a surplus of cash flow can be used to either increase investments (*Inv*), accumulate cash holdings (*Cash*) or pay dividends (*Div*), while sources of additional cash flow comprise external financing through variations in debt (*Debt*) or equity (*Equity*). Because equation (2) is an identity, it must hold without additional constraints (Chang et al., 2014). equation (2) holds consistently in our data.

Additionally, this literature (Chang et al., 2014; Dasgupta et al., 2011; Drobetz et al., 2019; Gatchev et al., 2010) argues that firms delay when they spend any surplus of cash flow. For instance, firms can increase any use of cash flow when they realize a cash flow surplus, to invest only in subsequent periods. This literature, therefore, suggests including lagged values of *Cash flow* in equation (1) to accommodate these intertemporal effects. Hence, to account for both interdependence and intertemporal effects, we follow Chang et al. (2014) and estimate different extended versions of equation (1). For each of the five channels represented on the right-hand side of equation (2), we estimate the following equation:

$$\begin{aligned} Channel_{i,t} = {} & \beta_1 + \beta_2 \left(\frac{CF_{i,t}}{TA_{i,t-1}} \right)_{i,t} + \beta_3 \left(\frac{CF_{i,t}}{TA_{i,t-1}} \right)_{i,t-1} + \beta_4 Tobin'sQ_{t-1} + \beta_5 Size_{t-1} + \beta_6 Debt_{t-1} + \beta_7 Tangibility_{t-1} \\ & + \eta_i + \psi_t + \omega_c \times \psi_t + \varphi_i \times \psi_t + \varepsilon_{it}, \end{aligned} \tag{3}$$

where *Channel* denotes the flows of funds from one of the five terms on the right-hand side of equation (2), $\Delta Cash$ is the variation of cash and equivalents over total assets, *Div* is total dividends paid over total assets, $\Delta Debt$ is the variation of total debt over total assets, $\Delta Equity$ is the variation of shareholder equity over total assets and *Tangibility* is tangible fixed assets over total assets. All the remaining variables are the same as in equation (1). While *Channel* accounts for the interdependence of financial decisions, lagged *Cash flow* accounts for the intertemporal allocation of cash flow. Because equation (2) is an accounting identity, the coefficients β_2 across the five channels must sum to unity. Following Chang et al. (2014), we do not impose any additional constraints when estimating these equations and demean all the variables. Finally, when *Investment* is the dependent variable, β_2 is the ICFS coefficient.

Table 13 contains the results of the five equations. There are four panels, one for each subsample of countries. We observe that the sum of the coefficients of *Cash flow (t)* is close to unity. In Panel A (i.e., the LSLC subsample), the ICFS coefficient is 0.401, while the same coefficient is 0.159, 0.281 and 0.401 in Panels B to D (i.e., subsamples LSHC, HSLC and HSHC), respectively. Due to the accounting identity nature of equation (2), the magnitude of coefficients is not directly comparable to those reported in our results. However, taken together, the results presented in Table 13 support our hypotheses 1 and 2.

Table 13, Panel E, presents the *z*-scores of the differences in the ICFS coefficients as in Table 6. Moving from the LSLC subsample to either of the two subsamples with unbalanced protection shows a statistically significant decrease

[6] We are grateful to one anonymous reviewer for this valuable suggestion.

TABLE 13 Country institutions and ICFS–matched sample–interdependence and intertemporal effects

Dependent variable =	*Investment*	*D.Cash*	*Dividends*	*D.Debt*	*D.Equity*	*Investment*	*D.Cash*	*Dividends*	*D.Debt*	*D.Equity*
	1	2	3	4	5	1	2	3	4	5
	Panel A. LSLC					Panel B.LSHC				
Cash flow (t)	0.401	0.275	0.075	−0.827	0.776	0.159	0.573	0.327	−0.730	0.933
	[6.935]	[3.080]	[4.306]	[−6.104]	[6.994]	[2.182]	[3.883]	[5.776]	[−6.336]	[7.464]
Cash flow (t−1)	0.038	−0.145	−0.002	−0.013	−0.100	0.031	−0.209	0.023	0.036	−0.188
	[1.473]	[−2.355]	[−0.321]	[−0.200]	[−1.421]	[0.791]	[−2.408]	[1.285]	[0.544]	[−2.363]
Tobin's Q (t−1)	0.006	−0.006	0.003	0.020	−0.019	0.001	−0.039	0.004	0.014	−0.049
	[2.163]	[−1.152]	[2.604]	[3.128]	[−2.611]	[0.182]	[−3.089]	[2.082]	[2.504]	[−4.185]
Size (t−1)	0.003	−0.008	−0.003	−0.041	0.041	0.011	0.068	0.001	0.020	0.059
	[0.455]	[−0.807]	[−1.855]	[−3.257]	[3.675]	[1.344]	[3.177]	[0.227]	[1.289]	[2.597]
Debt (t−1)	−0.046	−0.102	−0.009	−0.314	0.153	−0.053	−0.118	−0.005	−0.432	0.245
	[−2.686]	[−2.189]	[−1.902]	[−5.273]	[3.360]	[−2.497]	[−2.030]	[−0.442]	[−6.165]	[3.728]
Tangibility (t−1)	−0.078	−0.016	0.002	0.056	−0.116	−0.122	−0.072	−0.011	−0.008	−0.098
	[−2.787]	[−0.430]	[0.267]	[0.859]	[−2.021]	[−1.781]	[−0.709]	[−0.320]	[−0.088]	[−1.048]
Constant	−0.008	−0.013	0.008	−0.006	−0.019	0.016	−0.019	0.003	0.080	−0.084
	[−0.402]	[−0.382]	[1.207]	[−0.140]	[−0.442]	[0.862]	[−0.690]	[0.343]	[3.116]	[−3.659]
Observations	4,052	4,052	4,052	4,052	4,052	1,178	1,178	1,178	1,178	1,178
R^2	0.803	0.579	0.928	0.636	0.623	0.778	0.671	0.911	0.678	0.723

(Continues)

TABLE 13 (Continued)

	Panel C. HSLC					Panel D. HSHC				
Dependent variable =	*Investment*	*D.Cash*	*Dividends*	*D.Debt*	*D.Equity*	*Investment*	*D.Cash*	*Dividends*	*D.Debt*	*D.Equity*
	1	2	3	4	5	1	2	3	4	5
Cash flow (t)	0.281	0.661	0.055	−0.398	0.646	0.401	0.288	0.192	−0.378	0.379
	[8.338]	[3.704]	[6.685]	[−3.253]	[8.155]	[9.793]	[3.184]	[8.856]	[−4.995]	[3.836]
Cash flow (t−1)	0.074	−0.213	0.020	−0.046	−0.069	0.052	−0.347	0.030	−0.041	−0.238
	[3.290]	[−1.176]	[3.148]	[−0.489]	[−0.641]	[2.488]	[−4.357]	[2.702]	[−0.881]	[−3.016]
Tobin's Q (t−1)	0.002	−0.022	0.002	0.002	−0.021	0.001	−0.002	0.000	0.001	−0.002
	[1.291]	[−1.533]	[2.159]	[0.415]	[−2.019]	[1.229]	[−0.404]	[0.460]	[0.441]	[−0.427]
Size (t−1)	−0.004	0.039	0.001	0.026	0.026	0.001	0.009	−0.001	0.016	−0.002
	[−0.863]	[2.236]	[0.713]	[2.396]	[2.000]	[0.467]	[1.153]	[−0.886]	[2.730]	[−0.282]
Debt (t−1)	−0.037	−0.119	−0.010	−0.416	0.245	−0.022	−0.103	−0.011	−0.467	0.327
	[−2.979]	[−1.585]	[−4.013]	[−9.754]	[5.683]	[−2.231]	[−2.687]	[−2.217]	[−15.828]	[8.826]
Tangibility (t−1)	−0.146	−0.148	0.005	0.012	−0.236	−0.057	−0.139	0.003	0.049	−0.232
	[−6.281]	[−1.624]	[1.209]	[0.243]	[−3.327]	[−3.110]	[−2.982]	[0.470]	[1.359]	[−4.850]
Constant	0.026	0.002	0.002	0.013	0.014	0.005	−0.011	0.002	−0.045	0.038
	[1.135]	[0.058]	[0.287]	[0.655]	[0.561]	[0.490]	[−0.505]	[0.251]	[−1.850]	[1.470]
Observations	7,278	7,278	7,278	7,278	7,278	6,472	6,472	6,472	6,472	6,472
R^2	0.756	0.514	0.918	0.559	0.577	0.721	0.505	0.811	0.570	0.541

(Continues)

TABLE 13 (Continued)

Panel E. Differences in ICFS across quadrants										
Dependent variable =	*Investment*	*D.Cash*	*Dividends*	*D.Debt*	*D.Equity*	*Investment*	*D.Cash*	*Dividends*	*D.Debt*	*D.Equity*
	1	2	3	4	5	1	2	3	4	5
LSHC – LSLC	**H1**		**Negative**	**−2.605**						
HSLC–LSLC	**H1**		**Negative**	**−1.799**						
HSHC–LSHC	**H2**		**Positive**	**2.901**						
HSHC–HSLC	**H2**		**Positive**	**2.273**						

Note: t-statistics in brackets. The dependent variable is *Investment*, which is the variation in plant, property and equipment plus the variation of inventory over net total assets. *D.Cash* is the variation of cash and equivalents over net total assets. *Dividends* is total dividends paid over net total assets. *D.Debt* is the variation of total debt over net total assets. *D.Equity* is the variation of shareholders' equity over net total assets. *Cash flow* is net income plus depreciation and amortization over net total assets. *Tobin's Q* is market capitalization plus net debt over net assets. *Size* is the natural logarithm of gross sales. *Tangibility* is tangible fixed assets over net total assets. All variables are winsorized at the 1% level in both tails and demeaned. Standard errors are clustered by firm. All models contain firm fixed effects, year effects, country fixed effects interacted with year fixed effects, and industry fixed effects interacted with year effects. Independent financial variables are lagged 1 year. Firms are matched between quadrants, each year, using the values of lagged *Size* as a covariate. The z-score of the difference between the coefficients (b_1 and b_2) is measured following Paternoster et al.'s (1998, p.862) eq. 4 ($z = (b_1 - b_2)/\sqrt{SEb_1{}^2 + SEb_2{}^2}$). A *z*-score higher than 1.2 (or lower than −1.2) is significant at the 10% threshold (bold values).

in ICFS. Additionally, moving from the same two subsamples to the HSHC subsample increases ICFS significantly. Overall, Panel E suggests that hypotheses 1 and 2 are both supported.

6 | DISCUSSION AND CONCLUSION

In this study, we investigate how differences in legal institutions protecting minority shareholders and creditors' interests affect firms' ICFS across 21 economies, a controversial issue in both the scholarly and practical corporate finance literature. We find that strong legal protection for either minority shareholders or creditors tends to increase the supply side of capital markets, reducing firms' ICFS. This result, while important in demonstrating the role of legal institutions in the development of capital markets is not new since it is a central hypothesis of the law and finance literature (La Porta et al., 2000).

We extend the law and finance hypothesis by distinguishing between the strength of protection for different suppliers of capital and demonstrate that firms' investment behavior is sensitive to the way countries combine minority shareholder protection and creditor rights. Such an approach allows us to provide new evidence that the initial reduction in firms' dependence on internal cash flow associated with the ease of external financing made possible by a country's strength of investor protection tends to disappear when such protection becomes excessive (overregulation). Our conjecture and findings are consistent with the evidence of a potentially adverse consequence of overprotection of suppliers of capital in firm risk-taking and investment behavior (Acharya, Amihud, & Litov, 2011; Acharya, Sundaram, & John, 2011; Deakin et al., 2017). In other words, our findings suggest that the trade-off countries face when arranging their legal institutions as a system that coordinates the interests of minority shareholders and creditors (supply side) and firms (demand side) can lead to a suboptimal allocation of capital. In our research setting, such unintended effect is clearly observed in the institutional setting that combines strong protection for both creditors and minority shareholders. Our interpretation is that by providing too much protection to the supply side, countries may impose greater external monitoring, reducing managerial discretion, and increasing private costs, which in turn may lead managers to avoid external finance, increasing ICFS.

Our study provides policy and managerial implications. First, our findings suggest a regulatory trade-off regarding whether to strengthen institutional protection for different suppliers of capital. On the one hand, country-level legal institutions may be complementary, where one institution enhances the functioning of the other and, together, they improve market efficiency. On the other hand, they may reduce each other's effectiveness, thus leading to an institutional crowding out effect (Bowles, 2004) in which the positive effect of one legal provision cancels out the other. We show that the combination of strong minority shareholder and creditor protection can increase firms' ICFS, suggesting that excessive regulation can lead to market inefficiencies. We also add to the international corporate governance divergence–convergence debate (Rasheed & Yoshikawa, 2012) since our evidence shows that country-level investor protection differs not only across countries but also within countries when we distinguish between the strength of protection offered to minority shareholders versus creditors. Second, considering the above-mentioned regulatory trade-off and assuming the exogenous nature of country-level institutions, managers could potentially arbitrate and use international capital markets as alternative ways to finance their investment projects.

Our fine-grained approach to capturing differences in the protection of minority shareholders and creditors goes beyond previous studies that consider creditors' rights or shareholders' protection alone. Hence, we not only respond to recent calls from governance scholars to examine the role of country-level governance on firm-level decision-making (Aguilera et al., 2015; Denis & McConnell, 2003) but also reveal the complex and multidimensional perspectives of different sources of finance (Ahmadjian, 2016; Giofré, 2013; Haxhi & Aguilera, 2017). Our study speaks to a wider debate on the role of legal institutions in finance (Djankov et al., 2008; La Porta et al., 1997, 1998, 2000; Schnyder et al., 2021; Shleifer & Vishny, 1997; Spamann, 2010) since it reveals cross- and within-country differences in investor protection (minority shareholder protection vs. creditor protection) and their combined effects on firm investment behavior from an international and comparative perspective.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from Bureau van Dijk and Cambridge Center for Business Research (https://www.cbr.cam.ac.uk/datasets/). Restrictions may apply to the availability of Bureau van Dijk's data, which were used under license for this study.

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