Unbundling Institutions for Corporations

Dong Wook Lee[a,*], **Jee Eun Lee**[a], **Lingxia Sun**[b]

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Keywords: Institutions; Policing; Supporting; Free cash flow (FCF); Cross-country difference
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[a] Korea University Business School, Seoul, Korea
[b] International School of Business & Finance, Sun Yat-sen University, Guangdong, China

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1. Introduction

Institutions are a set of human-made constraints or "guardrails" that are devised to affect our incentives and transaction costs (North 1981, 1990, 1991). Almost tautologically, good institutions should lead to good economic outcomes because, by definition, they would affect our incentives and transaction costs in a way that we cooperate more, defect less, and engage in more economic activities. A large literature has developed—typically focusing on the role of institutions in protecting property rights and enforcing contracts—and, by now, it is correct to say that this thesis has been validated empirically—see, e.g., Acemoglu, Johnson, and Robinson (2002). A strand of this literature then evolved to "unbundle" institutions. This attempt is understandable, because institutions consist of many elements that work jointly yet in different dimensions. By dividing them into sub-categories, one can better understand how institutions work. As of this writing, the established view in the literature is Acemoglu and Johnson (2005; AJ hereafter), according to whom there are vertical institutions that govern the relations between the state rulers and the citizen, and horizontal institutions for the transactions among citizens. The former protects property rights of ordinary people from the state, while the latter enforces contracts among ordinary people. AJ (2005) show that property rights (i.e., vertical) institutions are generally more relevant for the cross-country differences in economic outcomes than contracting (i.e., horizontal) institutions.

In this paper, we propose a new way of unbundling institutions for corporations. Our motivation is two-fold. First, AJ (2005) find that, unlike other country-wide economic outcomes such as GDP and financial development, corporate valuations are closely related to both types of institutions. This leaves the *corporate sector as a niche* that warrants a new angle, and we take up this opportunity. Second, we find it possible—and useful for the corporate sector in particular—to *unbundle institutions by considering their targets*. This notion is on the grounds that: (1) an institution is a constraint or guardrail and as such reveals itself through whom it is applied to and (2) the usual "outcome variable" problem is minimal in the corporate sector. For example, despite lax constraints, state rulers and elites could choose to not abuse their power and instead use it in a productive way. In this case, the vertical (property rights) institutions and their effectiveness cannot be measured by the behavior of those in power—the very reason why an outcome variable is generally not recommended. Corporations are different. Even in the presence of good track records, any *room* for misbehavior in the future due to insufficient constraints on corporate insiders would affect the valuation *today*. It is thus possible—and even appropriate—to understand institutions for corporations by looking at their targets.

Specifically, we hypothesize two types of institutions for corporations, namely, ***policing*** and ***supporting***. (We elaborate on the targets of those institutions in the next paragraph.) This dichotomy is on the following three grounds. First, and quite plainly, it seems natural to categorize a given outcome as positive or negative and, accordingly, an institution contributing to a certain outcome can be thought of as fostering a good result or preventing a bad one. Second, most real-world relations and transactions are neither completely horizontal nor perfectly vertical; they are always sloped with multiple parties joining with differential negotiating power. In such a context, the role of institutions is to properly

police the party with more power (thereby preventing misbehavior) and correctly support the party with less power (thereby inducing productive economic activities). While all parties are subject to both policing and supporting, the relative importance between the two will differ across parties to the extent that their negotiating power is unbalanced. Third, the premise in the literature is that institutions vary at the country level because of the primary role played by the government in determining institutional quality and effectiveness. Indeed, policing and supporting summarize quite aptly the various roles that a state is mandated to play with its monopoly on legalized coercive power.

We identify corporate targets of policing and supporting institutions by using free cash flow (FCF). Defined as the internal funds minus capital expenditure, a company's FCF measures two different things on a single scale. When positive, it represents the resources at the discretion of corporate insiders. When negative, it quantifies the investment made possible by external funding. For *positive-FCF firms*, we thus need the policing role of institutions that ensure that those resources are not misused by corporate insiders. For *negative-FCF firms*, on the other hand, we need the supporting role of institutions that correctly identify and finance corporate growth potential. This mapping is admittedly imperfect. Empirically, however, FCF sorting is instructive as it creates two groups of companies that are readily identifiable, collectively exhaustive, and mutually exclusive with a clear-cut line between the two. This feature sets apart FCF from other possible sorting keys, such as firm size or growth rate. Finally, it is reassuring that both positive- and negative-FCF firms command a sizable and persistent presence in a given country, implying that both are subject to proper institutional interventions.

In this approach, it is unnecessary to identify policing and supporting institutions. In fact, our view is that a given institution plays both policing and supporting roles toward different targets. Consider, for example, the media. They unearth wrongdoings of the powerful and also report stories of those in need. That is, the media play the dual role of policing and supporting simultaneously, with each role aimed at different targets. Thus, the two roles are likely correlated with each other; and we agree. We further posit that various measures of institutional quality at the country level essentially quantify both roles of institutions and their effectiveness. With these premises, we ask whose economic outcome, between the targets of policing institutions and the targets of supporting institutions, shows a greater cross-country difference. Below is a schematic summary of our approach (left) vis-à-vis the existing one in the literature (right).
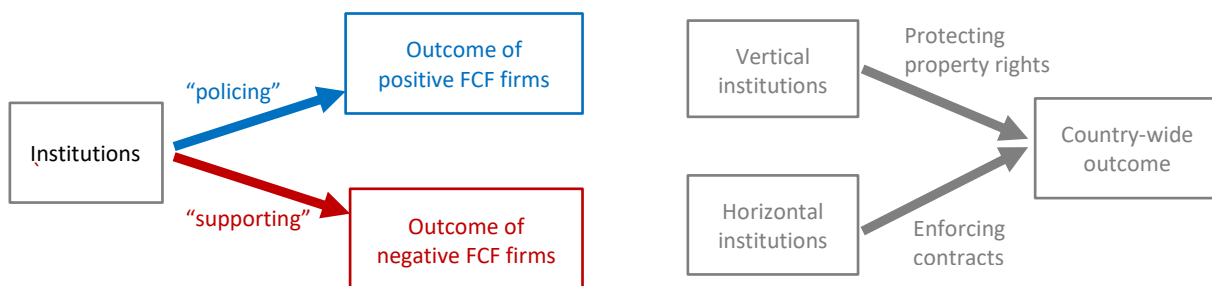
Using 474,042 firm-year observations from 43 countries for the period of 2000-2018, we find:

- Firm value (measured by Tobin's q) differs more across countries when it is estimated with negative-FCF firms than with positive-FCF firms.
- The firm value of negative-FCF firms is significantly higher in common law countries than in (French) civil law countries. Such a pattern is weak to non-existent with the firm value of positive-FCF firms.
- In lieu of legal origin, we use the World Bank's Doing Business Indicators (DBIs) and Worldwide Governance Indicators (WGIs) as a measure of country-level institutional quality. The results are qualitatively identical: only the valuation of negative-FCF firms is significantly related to those measures across countries.

Besides firm value, we use two more measures of corporate performance. One is the covariance between firm value and FCF, denoted as **FCF beta** and defined as follows:

$$FCF\ beta \overset{\text{def}}{=} cov(q, FCF)$$
$$= cov(q, CF - INV)$$
$$= cov(q, CF) - cov(q, INV)$$

By construction, the FCF beta measures the relative value-relevance between CF today and CF in the future, the latter of which is brought about by the investment today. By nature, policing and supporting are aimed at CF today and CF in the future, respectively. Therefore, the targets of policing institutions (i.e., positive-FCF firms) will have a positive FCF beta, and more effective policing would render their FCF beta more positive. In the same vein, the targets of supporting institutions (i.e., negative-FCF firms) will have a negative FCF beta, and it will be made more negative by better institutional supporting.

We find:

- In each of the 43 sample countries, the FCF beta is always positive among positive-FCF firms, while the FCF beta is always negative among negative-FCF firms.
- FCF beta differs more across countries when it is estimated with negative-FCF firms than with positive-FCF firms.
- The FCF beta of negative FCF firms is significantly more negative in common law countries than in (French) civil law countries. No such pattern exists in the FCF beta of positive-FCF firms.
- The FCF beta of negative FCF firms is significantly more negative in countries with a higher score of DBIs and WGIs than in countries with a lower score. The FCF beta of positive-FCF firms shows virtually no relation with those indices.
- Across countries, the firm value of negative-FCF firms is higher when their FCF beta is more negative. The relation between firm value and FCF beta is much weaker with positive-FCF firms.

As a third measure of corporate performance, we examine the persistence of same-sign FCF. Effective policing institutions would allow positive FCF to be *not* a red flag and instead contribute to firm value. Good supporting institutions would enable negative FCF to run on for some time as a sign of externally proven growth prospects and add to firm value. To measure this persistence, we compute the probability of consecutive same-sign FCF as follows.

$$FCF\ persistence \overset{\text{def}}{=} \begin{cases} Prob(FCF_t > 0 \mid FCF_{t-1} > 0) \\ Prob(FCF_t \leq 0 \mid FCF_{t-1} \leq 0) \end{cases}.$$

We find:

- The negative-FCF persistence differs more across countries than the positive-FCF persistence.
- The negative-FCF persistence is significantly stronger in common law countries than in (French) civil law countries. No such pattern exists in the positive-FCF persistence.
- The negative-FCF persistence is significantly stronger in countries with a higher score of DBIs and WGIs than in countries with a lower score. The positive-FCF persistence shows virtually no relation with those indices.
- Across countries, the firm value of negative-FCF firms is higher, the higher is the negative-FCF persistence. No such relation is found with the firm value of positive-FCF firms and the positive-FCF persistence.

In short, the systematic variation across countries is concentrated in negative-FCF firms. To the extent that the metrics we use (firm value, FCF beta, and FCF persistence) are shaped up by the institutions in a country, it follows that a meaningful cross-country difference in institutions—that is, the one that creates a difference in economic outcome—lies in those for negative-FCF firms. We argue that they are subject to the "supporting" type of institutions for corporations, which discover and finance corporate growth opportunities so that companies can invest beyond their means (thereby running negative FCF).

Why, then, do the institutions for positive-FCF firms—namely, the "policing" type of institutions—*not* create a meaningful cross-country difference in economic outcome? There are three possible explanations.

1. Those institutions are ineffective and irrelevant for economic outcomes.
2. Those institutions are effective yet functionally similar across countries.
3. Non-country institutions are actively at work and mitigate any cross-country differences that are caused by the institutional differences at the country level.

Of the three, we test the third explanation, which can be elaborated in the following way. Companies with positive FCF may well have various firm-level and industry-wide governance provisions, besides country-specific ones, that can assure outside investors of the proper use of internal funds by corporate

insiders. It is also likely that companies and industries with more positive FCF have more effective institutional schemes in place (regardless of the direction of causality). As a result, positive FCF may find its way to firm value via non-country-specific channels. In short, country-specific factors in FCF, firm value, and FCF beta would weaken in the presence of non-country institutions and a result like ours could arise.

For this explanation to be valid, there should be strong country-specific factors ("country effects") in the metrics of negative-FCF firms but positive-FCF firms contain greater industry-wide commonalities ("industry effects") as well as greater firm-specific components. We test these predictions by directly comparing country effects with industry effects, alongside firm-specific elements, in our metrics. We find:

- Negative FCF has larger country effects than industry effects. In positive FCF, the two effects are similar in magnitude.
- Positive FCF has large firm-specific components accounting for more than 90% of the total variation, whereas negative FCF has less than 70% of its variation attributable to firm-specific factors.
- The valuations of negative-FCF firms have larger country effects than industry effects. In the valuations of positive-FCF firms, the two effects are comparable in magnitude.

In conclusion, the mosaic of our results prove that our hypothesis is useful. To wit, we hypothesize that a country's institutions for corporations can be unbundled into those for positive-FCF firms ("policing" institutions) and those for negative-FCF firms ("supporting" institutions). The main takeaway from our results is that cross-country differences in corporate performance are concentrated in negative-FCF firms. Our preferred interpretation of the results is that supporting institutions for negative-FCF firms are country-bound but policing institutions for positive-FCF firms are present both beyond country borders and within a company.

The rest of the paper proceeds as follows. Section 2 reviews related literatures and highlights our contributions to them. Section 3 explains the sample and data. Section 4 reports the baseline empirical results, and Sections 5 through 7 offer additional empirical analyses and results. Section 8 concludes the paper.

2. Related literatures

Our paper belongs to four literatures. First, it joins the literature on institutions and their impacts on economic outcome, which dates back at least to North and Thomas (1973) and North (1981, 1990). North (1991) remains an excellent introduction to this literature and early empirical evidence is available in Knack and Keefer (1995), Mauro (1995), and Hall and Jones (1999). Then come Acemoglu, Johnson, and Robinson (AJR 2001) who address a more fundamental question of *why* institutions

differ across countries in the first place and then cause varying economic performances subsequently. The authors show that the institutional differences originate from unequal colonial experiences and lead to diverging economic outcomes across countries. The importance of institutions is further confirmed by later studies (e.g., AJR 2002; Easterly and Levine 2003; Rodrik, Subramanian, and Trebbi 2004; AJR 2012). To this literature, we add: (1) there are two different types—or roles—of institutions for corporations—namely, policing institutions and supporting institutions—and (2) it is the latter that is associated with a significant cross-country difference in economic outcome.

The second literature to which our paper belongs is a large body of research on law and finance. At the beginning, this literature did not point to institutions as a key determinant of economic growth (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LLSV) 1998). In a later study, the role of institutions is more explicitly recognized, in that a country's legal origin exogenously determines the way that various legal and regulatory institutions develop and those institutions, in turn, affect economic outcomes (La Porta, Lopez-de-Silanes, and Shleifer (LLS) 2008; p.292). Along the way, legal origin has been interpreted increasingly liberally and it now presents itself as a proxy for "a style of social control of economic life" (LLS 2008; p.286). This characterization of legal origins resonates quite well with North's (1991) definition of institutions, which is "humanly devised constraints that structure political, economic and social interaction" (p.97). In a word, legal origins can speak to the institutional environments of a country, as is also argued by Glaeser and Shleifer (2002). Furthermore, given a myriad of papers that empirically document the pervasive correlation of legal origins with country-level institutions and their effectiveness (see LLS (2008) and the references therein), legal origin is at least a legitimate *empirical* proxy for a country's institutions and their effectiveness. To this literature, we add that the empirical explanatory power of legal origins is more nuanced when it comes to the institutions for corporations. Specifically, cross-country differences in corporate performance—as an outcome of institutions—line up with legal origins only when the performance is measured with a subset of companies in the country—i.e., negative-FCF firms.

A debate in this second literature—namely, which one between legal origin (LLSV 1998) and colonial history (AJR 2001) is more fundamental—is not an issue to our paper. Certainly, it is an important intellectual question and valuable empirical results exist in the literature (e.g., Beck, Demirguc-Kunt, and Levine 2003; Klerman, Mahoney, Spamann, and Weinstein 2011). We, however, use legal origin as an *empirical* proxy, and legal origin and colonial history are empirically "almost perfectly congruent" (Klerman, Mahoney, Spamann, and Weinstein 2011; p.380). Our use of legal origin is simply on the grounds that it has the minimal measurement error. With a few exceptions, there is little disagreement as to a country's legal origin. It is just as factual as, say, Korea is in Asia. (On the other hand, data on colonial history, such as the settlement mortality, has been questioned by later studies – see, e.g., Albouy (2012) and AJR (2012).)

Another debate in this second literature is whether there is something more fundamental than institutions, such as human capital (e.g., Glaeser, La Porta, Lopez-de-Silanes, Shleifer 2004; Gennaioli, La Porta, Lopez-de-Silanes, and Shleifer 2013; Acemoglu, Gallego, and Robinson 2014; see also the

references in Glaeser et al. (2004)). This debate implies the reverse causality in which the national wealth and prosperity (which is caused by something) motivates the development of nation-wide institutions, not the other way around. As noted by Knack and Xu (2017), however, this is less of an issue to an analysis with firm-level data like our paper, because firm-level performance and wealth cumulation is highly unlikely to trigger the development of country-level institutions. Thus, our paper sidesteps this debate as well.

The third literature to which our paper belongs is the one on unbundling institutions, which includes Johnson, McMillan, and Woodruff (2002), AJ (2005), Cull and Xu (2005), and Knack and Xu (2017). Let us detail this literature so that we can correctly claim our contributions. Johnson et al. (2002) compare the relative importance between property rights and external finance—i.e., political institutions and financial institutions. Using firm-level survey data from five former communist countries (Poland, Slovakia, Romania, Russia, and Ukraine), the authors find that property rights, or equivalently, political institutions are more important. Cull and Xu (2005) take this approach one step forward by focusing on China in the year of 2002. This is the time and place in which the transition of a former communist country to a market economy has transpired significantly (albeit not completely). The conjecture is that, in such a time and place, the relative importance between political institutions and financial institutions could be more balanced than in Johnson et al. (2002). Indeed, Cull and Xu (2005) find that to be the case. Also, following AJ (2005), the authors subdivide political institutions into those for citizen vs. state and those for citizens themselves, and find the two types of political institutions to be evenly important for Chinese companies. Of course, it is AJ (2005) who formally conceptualize the two types of institutions in the name of property rights (vertical) institutions vs. contracting (horizontal) institutions. While their cross-country results largely favor property rights institutions, corporate valuation is uniquely influenced by both contracting and property rights institutions—thereby motivating our paper. As mentioned above, Knack and Xu (2017) seek to overcome the reverse causality between institutions and economic outcome by focusing on firm-level outcome. Knack and Xu (2017) also seek to improve the empirical measurement by employing several different measures for each of the two types of institutions. Their main finding is that firm-level external funding is facilitated more by property rights institutions than by contracting institutions.

To this literature, we add a new angle at unbundling institutions, both conceptually and empirically. First, at the conceptual level, we propose that institutions can be categorized into policing and supporting, because there are two broad classes of economic outcomes (i.e., negative and positive) and the role of institutions is to prevent bad outcomes from happening (i.e., policing) and encourage good outcomes to arise (i.e., supporting). Second, we propose that, at least in the corporate sector, we can identify the two types of institutions by looking at their respective targets and their performance, because the corporate sector has the forward-looking performance measure—namely, stock-market valuation. In other words, unlike typical outcome variables such as the behavior of political dictators, stock-market valuations immediately reveal any scope of future misbehavior that is made possible by insufficient constraints on corporate insiders. Thus, it is appropriate to understand institutions by looking at their targets. Third, on the empirical front, we propose that corporate FCF is an instructive

sorting key to identify the targets of differing institutional interventions. Specifically, positive-FCF firms are subject to policing institutions (because of the internal resources in the hands of corporate insiders), while negative-FCF firms are subject to supporting institutions (because of the investment needs that exceed internal means). Finally, also on the empirical front, we validate this new angle by showing that cross-country differences in corporate performance are significant and in line with some proven measures of the quality of country-level institutions *only when* the performance is measured with negative-FCF firms.

The fourth and last literature to which our paper belongs is the international studies on corporate investment in relation to country-level institutional characteristics (e.g., McLean, Zhang, and Zhao 2012; Brown, Martinsson, and Petersen 2013; Burkart, Gromb, Mueller, and Panunzi 2014; Lin, Mihov, Sanz, and Stoyanova 2019). McLean, Zhang, and Zhao (2012) in particular show that, for a period of 1990-2007, the investment sensitivity to q is stronger but the investment sensitivity to cash flows is weaker in countries with better investor protection. That is, external financing is facilitated by investor protection. As investor protection is one important function of a country's institutions, their results suggest a less positive or a more negative FCF beta (as it is defined: $cov(q, CF) - cov(q, INV)$) in countries with higher-quality institutions. What we add to this body of research is the focus on FCF and the distinction between positive-FCF firms and negative-FCF firms. We specifically show that it is the negative-FCF firms that show such a negative FCF beta, and only this group of companies generates a significant cross-country difference. For positive-FCF firms, on the other hand, the FCF beta is positive. Further, there is a weak to no cross-country difference in the performance of positive-FCF firms, *because* industry-wide and firm-specific institutions are as actively at work as country-specific ones.

3. Sample and data

3.1. Sample

To construct the sample, we begin with all Datastream/Worldscope companies for non-U.S. countries and all Compustat firms for the U.S. over the period from 2000 to 2018. (Using FIC='USA', we identify and keep only American companies in Compustat.) The original DataStream/Worldscope data are in thousands of U.S. dollars but we convert them to millions, so that they are comparable to the Compustat data. We only use the firm-year observations in which: (1) both country code and industry code are available; (2) total assets, book value of common equity, and the market value of common equity are positive; and (3) total assets are not smaller than its book value of common equity. We also ensure that the country code and country name in the Datastream/Worldscope database are correctly matched (e.g., code 826 for United Kingdom and not, say, Cayman Islands). For country code, we use FIC in Datastream /Worldscope (for non-U.S. firms) and Compustat (for U.S. firms). For industry code, we use Fama-French's 48 industries. As a result, we have 43 countries and 41

industries that provide 474,038 firm-year observations. As many as 49,370 unique firms enter our sample at least once.[1]

Each year in each country, we categorize the sample companies into two groups by the sign of their FCF for that year. FCF is computed as: net income before extraordinary items and preferred dividends (IB) *plus* depreciation, depletion, and amortization (DP) *minus* capital expenditure (CAPX), *over* total assets (AT) (i.e., (IB + DP – CAPX) / AT). We do require both the cash flow (i.e., the sum of IB and DP) and the capital expenditure data (i.e., CAPX) to be not missing. The capital expenditure is the lower bound of corporate investment because most investment in intangible assets is expensed rather than capitalized and thus reduces CF in the first place (see, for example, Peters and Taylor (2017)). Finally, we require the Tobin's q ratio (defined shortly below) to be positive.

Table 1 shows the list of 43 countries along with the average number of sample companies and the fraction of negative-FCF firms therein. Approximately 14.7% of the sample firms are from the U.S., followed by Japan which accounts for nearly 13.5% of the sample. As such, the sample is uneven but correctly reflects the way that the global capital markets are composed of. Also, most of our analyses use the same number of observations from each country and, thus, this imbalance in the panel does not affect the results. In the table, we also include the legal origin information, which is from La Porta, Lopez-de-Silanes, and Shleifer (2008). An * mark next to the legal origin denotes the ones that are disputed as "mixed" by Klerman, Mahoney, Spamann, and Weinstein (2011). Four countries are marked, and we ensure that our results are not sensitive to them.

Figure 1 highlights the average fraction of negative-FCF firms in each country (bar), alongside its time-series standard deviation (dashed line). With just two exceptions, negative-FCF firms are in the minority in each country; still, they account for as much as 22% to 48% of the country's sample. The two exceptions are Australia and Canada, each having the negative-FCF firms represent 68% and 73% of their samples, respectively. It is also instructive to observe a relatively modest time-series standard deviation in each country, implying a persistent as well as a sizable presence of negative-FCF firms. The main message in Table 1 and Figure 1 is that negative-FCF firms constitute a meaningful subset in the country's corporate sector by any reasonable standards.

3.2. Summary statistics – FCF and firm value

Table 2 reports summary statistics on FCF and firm value (Tobin's q), each of which is winsorized at

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[1] We obtained the industry information from:
    https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_48_ind_port.html.
We intentionally drop one Turkish company from the sample (Worldscope company code 27743TD), as its total assets change dramatically, from 610,175,184.58 in 1991 to 561.72 in 1992 and then to 516,504,061.49 in 1993. This seems an obvious error but, instead of artificially correcting the numbers, we exclude the company from the sample.

the 1 and 99 percentiles in each country separately for positive- and negative-FCF firms. The first row shows that FCF is still widely distributed from –502.9% to 89.5% of total assets. The second row is for the 0/1 dummy variable for negative-FCF firm-year observations ($D_{neg\text{-}FCF\ firms}$). Its mean value of 0.41 indicates that 41% of our pooled sample are negative-FCF firm-year observations. The third row is for firm value measured by the Tobin's q ratio, which is computed as: book value of total assets (AT) *plus* market value of common equity (MKTCAP) *minus* book value of common equity (CEQ), *over* book value of total assets (AT) (i.e., (AT + MKTCAP – CEQ) / AT). For the companies outside the U.S., MKTCAP is the data item "MV" in Datastream/Worldscope. For the U.S. firms, it is the product of the number of common shares outstanding (CSHO) and the year-end closing price (PRCC_F) from Compustat. Like FCF, q is also broadly distributed between 0.10 to 183.98.

To facilitate statistical analysis, we put both FCF and Tobin's q in log. With positive FCF, it is straightforward to compute *ln*(FCF). With non-positive (i.e., including zero) FCF, we compute $-ln(-FCF^*)$, in which FCF^* is the original FCF moved left by the minimum FCF in absolute terms among negative FCF in the country. For example, if a country's closest-to-zero FCF among negative FCF is, say, –0.0001, all non-positive (i.e., including zero) FCF values are moved to the left by 0.0001. That way, we avoid putting zero FCF in log. In general, log transformation ensures that extreme values at both ends are mitigated and non-extreme ones are spread out for meaningful variation. Below we hypothetically visualize this effect.
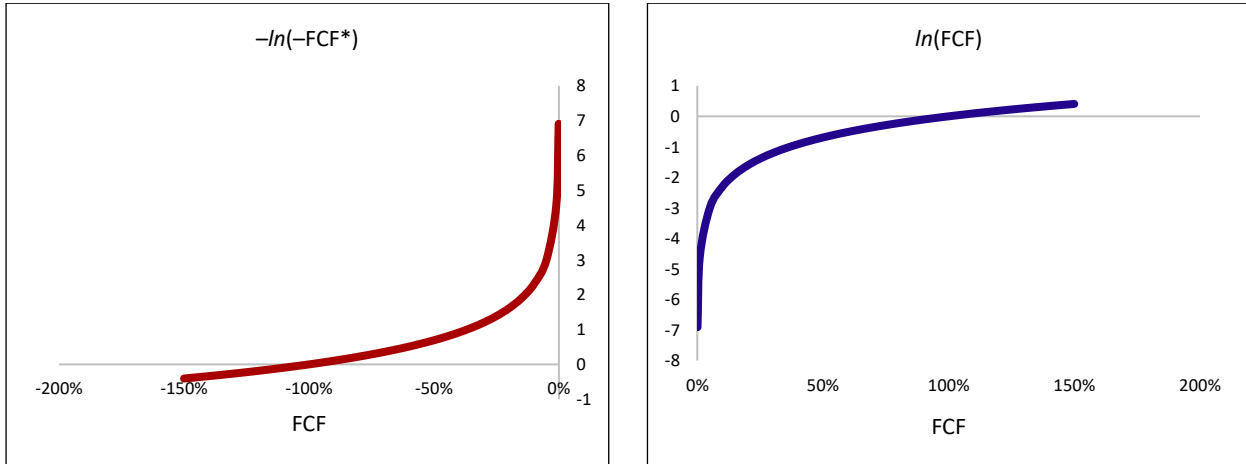

Figure 2 reports the actual data transformation, from Panel A to Panel B. Note the flipping of the sign. Negative FCF becomes positive as $-ln(-FCF^*)$, and positive FCF becomes negative as *ln*(FCF). This does not affect our analysis at all, because we conduct analysis within each group. From this point on, we use *LN_FCF* to denote both *ln*(FCF) for positive FCF and $-ln(-FCF^*)$ for negative FCF.

Figure 2, Panel C, shows the log transformed Tobin's q and its distribution. Just like FCF, the log transformation alleviates outliers while creating sufficient dispersion among normal values. Another

noteworthy observation in the figure is that the positive-FCF and negative-FCF firms are not different in terms of the Tobin's q in log. This observation thus ensures that our comparison between positive-FCF and negative-FCF firms is not a sideshow of a comparison between low-q and high-q companies.

4. Main empirical results

Our first analysis, reported in Section 4.1, is to see whether the "systematic" cross-country variation in firm value is different between positive-FCF and negative-FCF firms. We then repeat the analysis with FCF beta in lieu of firm value (Section 4.2), and with FCF persistence in place of firm value (Section 4.3). By "systematic", we mean that cross-country differences are related to the quality of country-level institutional quality. As a measure of country-level institutional quality, we employ legal origin. In the next section (Section 5), we turn to more granular measures, namely, the World Bank's Doing Business Indicators (DBIs) and Worldwide Governance Indicators (WGIs). Specifically, below is the main cross-country regression:

$$perform_{k,c} = a + b \times institution_c + c \times \ln(GDP\_pc) + e_{k,c}, \qquad (1)$$

where $perform_{k,c}$ is the performance measure of company group k in country c (k = positive- or negative-FCF firms), which is firm value, FCF beta, or FCF persistence, and $institution_c$ is country c's institutional quality, which is the legal origin, the World Bank's Doing Business Indicators, or the World Banks' Worldwide Governance Indicators. The per-capita GDP is the average over the period of 2000-2018. All GDP data except for Taiwan are obtained from The World Bank (https://data.worldbank.org/indicator/NY.GDP.PCAP.KD). The data for Taiwan are from the country's National Statistics web-site (https://eng.stat.gov.tw). We would be remiss if we included an array of country-level institutional characteristics in the regression, because the premise here is that most of those institutions stem from legal origin or what the legal origin proxies for.

4.1. Firm value

To conduct our analysis, we need a measure of firm value that is unique to a given country, so that its cross-country variation is truly attributable to countries. The measure also needs to be computed over a subset of companies—either positive-FCF firms or negative-FCF firms—in the country. The following equation satisfies both requirements.

$$\ln(q_{k,t}) = \alpha + \sum(\alpha^C \times C) + \sum(\delta^t \times Y) + \varepsilon_{k,t}, \qquad\qquad (2)$$

where $\ln(q_{k,t})$ is the natural log of firm k's q ratio in year t, C's are a set of country fixed effects, and Y's are a set of year fixed effects. We restrict $\Sigma\alpha^C$ and $\Sigma\delta^t$ to be equal to zero, respectively, to avoid multicollinearity (see, e.g., Bae, Chan, and Ng (2004)). This specification uses the global average (α) as benchmark and allows α^C's to measure each country's unique corporate valuations relative to the global average. By construction, the country-specific valuation estimated here is on average zero across the global average valuation and it is a percentage difference from the global average as a log return. For example, an estimate of 0.2 means that the country's valuation is the global average *times $e^{0.20}$*, which is approximately 22% higher than the global average ($\alpha \cdot e^{0.20} \approx 1.22\alpha$). It is correct to use the log return here, because it ensures symmetry between above and below the global average. Finally, Eq. (2) is a panel regression that utilizes a larger number of observations and thus reduces the effects of outliers. We estimate Eq. (2) separately for positive-FCF and negative-FCF firms.

Table 3, Panel A, reports the summary statistics on the country-specific firm value estimates. The global average for each subsample is 0.276 for positive-FCF firms ($e^{0.276} \approx$ Tobin's q ratio of 1.32) and 0.223 for negative-FCF firms ($e^{0.223} \approx$ Tobin's q ratio of 1.25). The country-specific firm value is more widely dispersed when it is estimated with negative-FCF firms than with positive-FCF firms. The range of the 43 country-specific firm value for positive-FCF firms (after adjusted for their global average) is 0.859 while that of negative-FCF firms is 0.874. With the interquartile range, the contrast is 0.177 for positive-FCF firms vs. 0.216 for negative-FCF firms. Finally, the cross-country standard deviation is 0.159 for positive-FCF firms and 0.194 for negative-FCF firms. Figure 3 visualizes these differences in cross-country variation between positive- and negative-FCF firms.

Panel B of Table 3 reports the regression results for the "systematic" dispersion in country-specific valuation. Beginning with the top part of the panel, country-specific firm value cleanly lines up with legal origin (i.e., higher valuations in common law countries) *only when* the country-specific valuation is estimated with negative-FCF firms. With positive-FCF firms, in contrast, the well-known link between legal origin and firm value is missing. To the extent that legal origin is a reasonable proxy for a country's institutions and their effectiveness and that firm value is an outcome of those institutions, this result indicates that the institutions for negative-FCF firms create a difference across countries, but not the institutions for positive-FCF firms. When we limit the analysis to common law and French civil law countries (bottom part of Panel B), the average firm value is different between the two legal origins even with positive-FCF firms. However, it is only marginally significant with a p-value of 0.067. Further, the results is much sharper for negative-FCF firms with a p-value of 0.003.

4.2. FCF beta

To be consistent with our firm value analysis in the preceding section, we estimate the FCF using the panel regression, which is:

$$\ln\left(q_{k,t}\right) = \alpha + \beta \times LN\_FCF_{k,t}$$

$$+\sum(\alpha^C \times C) + \sum\left(\beta^C \times LN\_FCF_{k,t} \times C\right) \qquad (3)$$

$$+\sum(\delta^t \times Y) + \varepsilon_{k,t} \ ,$$

where $\ln(q_{k,t})$ is the natural log of firm k's q ratio in year t, $LN\_FCF_{k,t}$ is the log-transformed FCF of firm k in year t (see Section 3.2 for details), and C's and Y's are a set of country fixed effects and year fixed effects, respectively. We restrict $\Sigma\alpha^C$, $\Sigma\beta^C$, and ΣY_t to be equal to zero, respectively, to avoid the multicollinearity problem. This equation allows countries to have different FCF betas (β^C's) as well as different intercepts (α^C's). The intercept, α, and the coefficient on LN_FCF itself, β, are the common for all countries. Therefore, a country's FCF beta is the sum of β and β^C. We use this sum in the ensuing analysis to correctly see whether a country's FCF beta is positive or negative.[2]

Table 4 has two panels. First, Panel A shows that, consistent with our hypothesis detailed in the Introduction, the FCF beta is positive among positive-FCF firms and it is negative among negative-FCF firms. Across the 43 sample countries, the minimum FCF beta among positive-FCF firms is 0.091 and the maximum is 0.282. In contrast, the FCF beta among negative-FCF firms ranges from –0.294 to –0.006 across countries.[3] Like firm value, the cross-country variation in FCF beta is greater with negative-FCF firms. Specifically, the range of the FCF beta for positive-FCF firms is 0.197 and is smaller than that of negative-FCF firms, namely, 0.275. In terms of inter-quartile range, the variation is also smaller with positive-FCF firms (0.064) than with negative-FCF firms (0.105). The cross-country standard deviation compares qualitatively the same: 0.045 for positive-FCF firms vs. 0.068 for negative-FCF firms. As before, we also visualize these differences in cross-country variation between positive- and negative-FCF firms in a figure (Figure 4, Panel A).

Panel B of Table 4 reports the relation between the FCF beta and legal origin. As with firm value, with negative-FCF firms, the FCF beta is more negative in common law countries than in (French) civil law countries. The relation is highly significant at less than 1% level in all estimation models. In

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[2] This estimation is virtually identical to the country-by-country estimation in which the q in log is regressed on the FCF in log in each country. The only infinitesimal difference between the two estimation methods would stem from our panel regression being estimated on an unbalanced dataset. See, e.g., Greene (2000; p.566-567).
[3] Note that the sign-matching between FCF and FCF beta is *not* a hard-wired result. Some studies also report consistent results. See, for example, Lee, Shin, and Stulz (2021) and Choi and Lee (2021).

contrast, the positive FCF beta among positive-FCF firms are not significantly different across legal origins. With all 43 countries, the p-values are greater than 0.400 and in a smaller sample of common law or French civil law countries, the p-value is at best 0.159. To the extent that legal origin is a reasonable proxy for a country's institutions and their effectiveness and that the FCF beta is formed by those institutions, the result here is a strong indication that the cross-country difference in institutions is concentrated in those for negative-FCF firms that are subject to supporting institutions.

We conclude this sub-section by reporting the relation between firm value and FCF beta. As explained in the Introduction, the job of policing institutions would be completed only when they allow positive FCF to add to firm value. Similarly, the ultimate task of supporting institutions is to allow negative FCF to increase firm value. We thus plot firm value and FCF beta, separately for positive- and negative-FCF firms.

Figure 4, Panel B, shows that the country-specific firm value and FCF beta are correlated with each other, and this correlation is stronger when both are estimated with negative-FCF firms than with positive-FCF firms. Moreover, the correlation for negative-FCF firms is negative, meaning that the country-specific valuation is higher when the FCF beta is more negative. For positive-FCF firms, the correlation between the country-specific firm value and the country-specific FCF beta is positive. However, this correlation is much weaker.

4.3. FCF persistence

The persistence of same-sign FCF is measured by the conditional probability. Specifically, we keep track of each sample firm over time and code whether the firm has the same-sign FCF in two years in a row. Using this information, we compute $\text{Prob}(FCF_t > 0 \mid FCF_{t-1} > 0)$ and $\text{Prob}(FCF_t \leq 0 \mid FCF_{t-1} \leq 0)$ each year in each country. We then average them over time within a country.

Table 5, Panel A, reports summary statistics on those conditional probabilities. Two observations are unmistakable. First, the conditional probabilities are very high (0.811 for positive FCF and 0.638 for negative FCF), meaning that both types of FCF are receiving proper institutional interventions. Second, the cross-country variation is much larger in the negative-FCF persistence. For example, the cross-country standard deviation of negative-FCF persistence (0.088) is more than twice that of positive-FCF persistence (0.039). This implies that the institutional environments for negative-FCF firms—which we call the "supporting" institutions—vary much more across countries than those fo positive-FCF firms (the "policing" institutions). Figure 5, Panel A, is the graphical illustration of this result.

Panel B of Table 5 reports the regressions of the FCF persistence on legal origin. The negative-FCF persistence is significantly higher in common law countries than in (French) civil law countries. The statistical significance is at less than the 1% level and the economic magnitude is also sizable. For

example, between common law and civil law countries in the full 43-country sample, the negative-FCF persistence is higher in common law countries by 0.086, which is on par with the cross-country standard deviation in Panel A. As for the positive-FCF persistence, it is in fact *lower* in common law countries than in (French) civil law countries, although the statistical significance is not as robust. That is, in common law countries, negative FCF tends to remain negative while positive FCF likely turn negative, relative to (French) civil law countries.

This begs the question of how the FCF persistence is related to firm value. Panels B and C of Figure 5 show that, across countries, firm value is closely related to the negative-FCF persistence but not to the positive-FCF persistence. That is, firm value is higher in countries where negative FCF is persistent over time—a sign that supporting system is at work and allows negative FCF to run on as an indication of externally proven growth opportunities and thus to contribute to firm value. The positive-FCF persistence, on the other hand, is completely irrelevant for the cross-country difference in firm value.

5. Alternative measures of country-level institutions

We now replace legal origin with more granular indices for country-level institutional quality. Specifically, we use two sets of indices. One is the World Bank's Doing Business Indicators (DBIs) and the other is the bank's Worldwide Governance Indicators (WGIs). Below, we report their results in figures.

5.1. Doing Business Indicators (DBIs)[4]

The DBIs are the indices for the following 10 categories.

1. Dealing with construction permits
2. Enforcing contracts
3. Getting credit
4. Getting electricity
5. Paying taxes
6. Protecting minority investors
7. Registering property
8. Resolving insolvency
9. Starting a business

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[4] We obtained the DBIs information from:
     https://databank.worldbank.org/source/doing-business.
For each indicator, we chose the version (i.e., methodology) that most coincides with our study period of 2000-2018. For example, we chose the "Enforcing Contracts" indicator based on the 04-15 methodology instead of 17-20 methodology.

10. Trading across borders

The overall index is called "Ease of doing business". Their availability in time-series is different from one country to another. Thus, we first average each DBI within a country over our study period (2000-2018), and then standardize each DBI using the cross-country mean and standard deviation. Finally, we regress each of the standardized DBIs on firm value, FCF beta, or FCF persistence. All of those regressions are a univariate cross-country regression, because of the high correlation among the DBIs. As always, the regressions are estimated separately for positive-FCF and negative-FCF firms.

Figure 6, Panel A, is for the relation between firm value and DBIs. We find that all DBIs—except for two—are significantly related to the valuation of negative-FCF firms, whereas only two DBIs are significantly related to the valuation of positive-FCF firms. The economic magnitude also differs between negative- and positive-FCF firms. The coefficients for negative-FCF firms are at least twice as large as those for positive-FCF firms. It seems indisputable that a systematic cross-country variation in firm value—i.e., the one that is related to the quality of country-level institutional quality—is concentrated in negative-FCF firms.

Panel B of Figure 6 turns to the relation between FCF beta and DBIs. Similar to firm value, all DBIs—except for one—are significantly related to the FCF beta of negative-FCF firms, whereas only one DBI is significantly related to the FCF beta of positive-FCF firms. Those relations are such that a higher index score (i.e., better institutional quality) is associated with a more negative FCF beta for negative-FCF firms and, with weak to no statistical significance, a more positive FCF beta for positive-FCF firms. Again, a systematic cross-country variation in FCF beta is present only in negative-FCF firms.

Panel C of Figure 6 is for FCF persistence and the results are qualitatively comparable to the preceding two. Across countries, the negative-FCF persistence is highly related to the quality of country-level institutions, but the positive-FCF persistence is literally unrelated to the institutional quality at the country level. The statistical significance weakens somewhat with some of the DBIs both for positive- and negative-FCF firms, but the difference between the two groups of companies couldn't be more visible.

5.2. Worldwide Governance Indicators (WGIs)[5]

We now substitute the World Bank's WGIs for its DBIs. This replacement has a good motivation. The DBIs focus on the efficiency of government policies and regulations from the perspective of small and medium-size companies. Thus, one could suspect that the DBIs are relevant particularly for negative-

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[5] We obtained the WGIs information from:
https://datacatalog.worldbank.org/search/dataset/0038026/Worldwide-Governance-Indicators.

FCF firms and their supporting institutions. The WGIs, on the other hand, quantifies "the traditions and institutions by which authority in a country is exercised" (quoted from the WGI's *frequently asked questions* section), which is a broad enough concept applicable to any company operating in the country. Thus, there is no reason to think that WGIs are more relevant to one set of companies than the other. Each of the six WGIs covers:

1. Control of Corruption
2. Government Effectiveness
3. Political Stability
4. Rule of Law
5. Regulatory Quality
6. Voice and Accountability

Note that some of the WGIs are frequently used as a measure of property rights institutions. For example, Lin, Mihov, Sanz, and Stoyanova (2019) do so with three of them ("Control of Corruption", "Rule of Law", and "Voice and Accountability").

Figure 7 reports the results. As shown in Panel A, all but one WGI are significantly and positively related to the valuation of negative-FCF firms. For positive-FCF firms, however, the coefficients are much smaller in the order of one half of those for negative-FCF firms. The statistical significance is also weaker with the valuation of positive-FCF firms.

Panel B of Figure 7 shows that each of the six WGIs is significantly related to the FCF beta of negative-FCF firms. However, none of them are related to the FCF beta of positive-FCF firms. Again, this result confirms that the systematic cross-country dispersion in FCF beta is limited to negative-FCF firms.

Panel C conveys the same message as the DBI results. The negative-FCF persistence is significantly related to the each of the six WGIs, in a way that a higher index score (i.e., better institutional quality) is associated with a more persistent negative FCF. In contrast, there is no such relation between any of the WGIs and the positive-FCF persistence.

6. Role of firm size

There is a nuanced size tilt with relation to the sign of FCF. As in Figure 8, Panel A, the distribution of log-transformed firm size (i.e., total assets in log) among our sample firms suggests that negative-FCF firms tend to be a tad smaller than positive-FCF firms. As an alternative look, we sort all (i.e., both positive- and negative-FCF) sample firms into quintiles by their total assets, each year in each country, and then compute the fraction of the size quintiles in each of the pooled FCF-sorted subsamples. The results in Panel B further confirm the size tilt. Specifically, nearly half of the positive-

FCF firms are from the top two size quintiles (22% + 24% = 46%) and the bottom two size quintiles have a relatively smaller presence (15% + 18% = 33%). In the group of negative-FCF firms, it is the opposite to a similar degree: the top size quintiles account for 31% and the bottom two size quintiles represent 50%. It is thus warranted to gauge the role of firm size in our results: prior studies have reported greater cross-country differences with small firms (e.g., Beck, Demirguc-kunt, and Maksimovic 2005; Knack and Xu 2017).

To this end, we compare small firms with larger ones, instead of comparing negative-FCF with positive-FCF firms. Specifically, each year in each country, we sort sample firms into two groups with the median total assets as the cutoff. We then examine the two size-sorted subsamples' country-specific valuation and FCF beta using Eq.'s (2) and (3), respectively. Note that we cannot conduct the FCF persistence analysis because it is meaningless to see whether a small firm remains small and a big firm remains such.

Figure 9 reports the results. Specifically, Panel A shows that, in terms of valuation, small firms show greater variation across countries than large firms. However, the FCF beta in Panel B then shows that, for both small and large firms, the FCF beta is close to zero on average. If any, the FCF beta of small firms is even slightly higher than that of large firms. Except for the obvious outliers, the two size-sorted subsamples show similar cross-country variation in FCF beta as well. These patterns make a sharp contrast with the FCF-sorted subsamples whose results are reported in Figure 4. To wit, there is a clear distinction between negative-FCF and positive-FCF firms, as the former shows a wider cross-country variation than the latter and, more importantly, the negative-FCF firms have a negative FCF beta while the positive-FCF firms have a positive FCF beta. Those opposing signs of the FCF beta are at the core of our hypothesis. Therefore, the observed patterns in Panel B of Figure 9 indicate that our hypothesis and the supporting evidence in the preceding sections are *not* a firm size-related result.

Table 6 reports the regression results. Panel A is for the country-specific firm value and Panel B for the country-specific FCF beta. The key message stemming from the two panels is that our earlier results with the FCF-sorted subsamples are not generated by the size-sorted subsamples. More specifically, while there is no difference in the valuation of large firms across countries (Panel A), the FCF beta of those big firms shows a systematic cross-country variation in a way that common law countries have more *negative* FCF beta (Panel B). In a word, our hypothesis does not work for small and large firms and it holds up only with the FCF-sorted subsamples.

7. Country vs. Industry

We explain the "no result" with positive-FCF firms as follows. Companies with positive FCF have various firm-level and industry-wide—i.e., non-country-specific—institutions that can assure outside investors of the proper use of internal funds by corporate insiders. That is, positive FCF can find its way to firm value via non-country-specific channels and, as a consequence, country-level resources-

policing institutions do not stand out in the cross-section in valuation across countries.

We test these empirical implications by directly quantifying the relative importance between country-specific factors and industry-specific factors—along with firm-specific components—in our key variables. We begin with FCF and proceed to firm value. When examining firm value, we take into account the different FCF betas across countries and industries.

7.1. Country vs. Industry effects in FCF

To assess the country-specific factors ("country effect") and industry-specific factors ("industry effect") in FCF, we estimate the following equation each year, separately for positive-FCF and negative-FCF firms:

$$LN_{FCF\,k,t} = \alpha + \sum(\alpha^C \times C) + \sum(\alpha^I \times I) + \varepsilon_{k,t} \qquad (4)$$

where $LN\_FCF_{k,t}$ is the log-transformed FCF of firm k in year t, C's and I's are a set of country and industry fixed effects, respectively. As always, we restrict $\Sigma\alpha^C$ and $\Sigma\alpha^I$ to be equal to zero, respectively, to avoid multicollinearity. Note that we estimate this equation each year; hence, no year fixed effects. This year-by-year estimation leads to a set of α^C's and α^I's for each year. A given year's average country effect is then: $CE_t^{avg} = \sum CE_t^C/nc_t$, where $CE_t^C = |\alpha_t^C|$ and nc_t is the number of countries in year t. Similarly, a given year's average industry effect is: $IE_t^{avg} = \sum IE_t^I/ni_t$, where $IE_t^I = |\alpha_t^I|$ and ni_t is the number of industries in year t.

Figure 10, the top two panels, shows the resulting country effects and industry effects, separately for positive and negative FCF. Clearly, the country effects are greater than the industry effects in negative FCF *and only in* negative FCF. Specifically, the country effects are approximately 0.4 while the industry effects are 0.3 for negative FCF. These estimates translate to FCF being 49% ($e^{0.4} \approx 1.49$) and 35% ($e^{0.3} \approx 1.35$) higher or lower than the global average due to country- and industry-specific factors, respectively. In contrast, both the country and industry effects in positive FCF are in the order of 0.2 or 22% ($e^{0.2} \approx 1.22$).

To determine the statistical significance of the difference between the two effects, we estimate the following equation:

$$E_{t,\frac{c}{i}} = a + b \times D_{CE} + \sum(\delta^t \cdot Y) + \varepsilon_{t,\frac{c}{i}} \ , \tag{5}$$

where E is a stack of the country effects (i.e., CE^C) and industry effects (i.e., IE^I) in year t, D_{CE} is a dummy variable that takes the value of 1 when the effect is a country effect. In this setup, the coefficient on D_{CE} is the mean difference between the country effect and the industry effect. We control for year fixed effects, and allow error terms to cluster within the same country or within the same industry.

Table 7, Panel A, shows that the difference between the country effect and the industry effect in negative FCF is significant at the 10% level, with a p-value of 0.067. In contrast, the difference is insignificant for positive FCF with a p-value of 0.440. The results clearly support our conjecture, which is that companies with positive FCF have active industry-wide institutions that allow positive FCF to contribute to firm value via non-country-specific channels. The results are also consistent with country-level institutions dominating industry-wide ones in negative FCF (i.e., for growth-supporting purposes).

Figure 10, the bottom panel, turns to firm-specific factors in FCF by reporting one minus the R-squared of Eq. (4) above. The equation's goodness of fit is driven by the commonality in FCF—be it country-specific or industry-wide—and thus the flip side (i.e., 1 − R-squared) quantifies the firm-specific factors in FCF. It is a widely accepted measure of idiosyncratic volatility in the literature (e.g., Lee and Liu 2011; Lee 2015). As shown in the figure, firm-specific components are the dominant factor in positive FCF, accounting for nearly 90% of its total variation. While negative FCF also has large firm-specific components, they are in the order of 70% of the total variation and pale in comparison with those in positive FCF.

7.2. Country vs. Industry components in firm value

We repeat the analysis with firm value to verify whether there are stronger country effects than industry effects in the firm value of negative-FCF firms but not in the firm value of positive-FCF firms. For this verification, we estimate the following equation in order to take into account different mean levels and FCF betas across countries and industries:

$$
\begin{aligned}
\ln(q_{k,t}) = &\ \alpha + \beta \times LN_{FCF_{k,t}} \\
&+ \sum(\alpha^C \times C) + \sum(\alpha^I \times I) \\
&+ \sum\left(\beta^C \times LN_{FCF_{k,t}} \times C\right) + \sum\left(\beta^I \times LN_{FCF_{k,t}} \times I\right) \\
&+ \varepsilon_{k,t}
\end{aligned}
\tag{6}
$$

where ln($q_{k,t}$) is the natural log of firm k's q ratio in year t and *LN_FCF*$_{k,t}$ is the log-transformed FCF of firm k in year t,while C's and I's are a set of country and industry fixed effects, respectively. We restrict $\Sigma\alpha^C$, $\Sigma\alpha^I$, $\Sigma\beta^C$, and $\Sigma\beta^I$ to be equal to zero, respectively, to avoid the multicollinearity problem. This equation allows both countries and industries to have different FCF betas (β^C's and β^I's) as well as different intercepts (α^C's, α^I's). Thus, a given country's uniqueness compared to other countries, while industry effects are controlled, is captured by α^C and β^C together. That is, this country's uniqueness in year t is measured by $CE_t^C = |\alpha_t^C| + |\beta_t^C|$, and a given year's average country effect is $CE_t^{avg} = \sum CE_t^C/nc_t$, where nc_t is the number of countries in year t. Similarly, a given year's average industry effect is $IE_t^{avg} = \sum IE_t^I/ni_t$, where $IE_t^I = |\alpha_t^I| + |\beta_t^I|$ and ni_t is the number of industries in year t.

Figure 11 shows the result. It is indisputable that only the valuation of negative-FCF firms has much stronger country effects than industry effects. A difference from Figure 10 is that there is a time-varying (partial) convergence and divergence between the country and industry effects in firm value. This is understandable given the larger volatility in market valuation than in accounting measure. Regardless, in negative FCF, the country effects are consistently higher than the industry effects.

Table 7, Panel B, then reports the statistical significance of the observed difference. We continue to use the specification of Eq. (6) while replacing the country and industry effects in FCF with those in firm value. As expected, the difference between the country effects and the industry effects is highly significant with a p-value of 0.001 in the valuation of negative-FCF firms. Also as expected from the figure, the difference between the two effects in the valuation of positive-FCF firms is insignificant with a p-value of 0.982.

8. Conclusions

As a human-made "guardrail" or "constraint", institutions affect us in two ways. Either they show us a path forward, or they put a roadblock ahead of us. A given institution does both yet toward different targets. For example, institutions are more a guardrail for those who get lost, but for those who are trespassing, institutions work as a constraint. Good institutions would yield good economic outcomes by properly guiding some people through while correctly checking others within. Our question is whether the two roles are symmetric in terms of creating a cross-country difference in economic outcome. Seeking to fill a void in the literature, we focus this question on the corporate sector, and find that the answer to this question is a resounding *no*. The cross-country difference in corporate performance is limited to the targets of "supporting" institutions. That is, there is little cross-country difference in the performance of the targets of "policing" institutions. The absence of cross-country difference with regard to policing institutions is due to the non-country policing mechanisms that work

across country borders or inside individual companies.

The targets of policing and supporting institutions in our analysis are, respectively, positive- and negative-FCF firms. Admittedly, this mapping is not perfect and a joint hypothesis problem exists. Namely, we cannot tell whether our results are driven by the correct conceptual dichotomy between policing and supporting institutions or by the useful empirical distinction between positive- and negative-FCF firms. Notwithstanding, our empirical results piece together for a coherent picture: during the contemporaneous time-period and vis-à-vis the same measures of country-level institutions, only one group of companies shows a significant cross-country variation. This empirical finding needs to be taken seriously in future research.

To wit, our proposed explanation for this empirical result is that the institutions for corporations play the dual role of policing and supporting and it is the latter that creates a meaningful cross-country difference. We further propose that, if the rulers of a state want to advance their country ahead of others, efforts should be made to make the country "strong" as an effective helping hand, but not as a monitoring or policing apparatus. This seeming ambivalence is in fact well in line with the notion of "consensually strong state equilibrium" of Acemoglu (2005).

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Table 1. Sample countries
This table shows the list of 43 countries along with the average number of sample companies and the average fraction of negative-FCF firms therein. We also report each country's legal origin (from La Porta, Lopez-de-Silanes, and Shleifer 2008) and the "mixed" legal origin (from Klerman, Mahoney, Spamann, and Weinstein 2011).

country	avg # of sample firms	avg % of negative-FCF firms	legal origin
ARGENTINA	62	38%	French
AUSTRALIA	1260	68%	Common
AUSTRIA	60	30%	German
BELGIUM	89	31%	French
BRAZIL	109	36%	French
CANADA	1625	73%	Common
CHILE	139	28%	French
CHINA	2138	40%	German
COLOMBIA	31	22%	French
DENMARK	109	33%	Scandinavian
FINLAND	119	28%	Scandinavian
FRANCE	533	31%	French
GERMANY	620	33%	German
GREECE	161	45%	French
HONG KONG	805	41%	Common
INDIA	1483	38%	Common
INDONESIA	293	37%	French
IRELAND	49	43%	Common
ISRAEL	260	40%	Common*
ITALY	196	33%	French
JAPAN	3361	26%	German
KOREA	1364	41%	German
LUXEMBOURG	22	31%	French
MALAYSIA	764	34%	Common
MEXICO	93	28%	French
NETHERLANDS	113	27%	French
NEW ZEALAND	99	36%	Common
NORWAY	140	48%	Scandinavian
PAKISTAN	154	31%	Common
PERU	82	23%	French
PHILIPPINES	135	39%	French*
POLAND	261	36%	German
PORTUGAL	44	26%	French
SINGAPORE	474	35%	Common
SOUTH AFRICA	235	29%	Common*
SPAIN	113	31%	French
SWEDEN	345	41%	Scandinavian
SWITZERLAND	176	23%	German
TAIWAN	1374	33%	German
THAILAND	422	29%	Common*
TURKEY	216	37%	French
UK	1152	44%	Common
USA	3669	45%	Common

Table 2. Summary statistics on FCF and firm value
This table reports summary statistics on FCF and firm value (Tobin's q), each of which is winsorized at the 1 and 99 percentiles in each country separately for positive- and negative-FCF firms. FCF is computed as: net income before extraordinary items and preferred dividends (IB) *plus* depreciation, depletion, and amortization (DP) *minus* capital expenditure (CAPX), *over* total assets (AT) (i.e., (IB + DP – CAPX) / AT). We require both the sum of IB and DP and the capital expenditure to be available. Each year in each country, we categorize the sample companies into two groups by the sign of their FCF for that year. $D_{neg\text{-}FCF\ firms}$ is the 0/1 dummy variable for negative-FCF firm-year observations. Tobin's q ratio is computed as: book value of total assets (AT) *plus* market value of common equity (MKTCAP) *minus* book value of common equity (CEQ), *over* book value of total assets (AT) (i.e., (AT + MKTCAP – CEQ) / AT). For the companies outside the U.S., MKTCAP is the data item "MV" in Datastream/Worldscope. For the U.S. firms, it is the product of the number of common shares outstanding (CSHO) and the year-end closing price (PRCC_F) from Compustat.

variable	n	mean	std	min	p1	p25	median	p75	p99	max
FCF (% of total assets)	474038	-6.0%	34.9%	-502.9%	-151.7%	-5.5%	1.6%	5.8%	27.1%	89.5%
$D_{neg\text{-}FCF\ firms}$	474038	0.41	0.49	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Firm value (Tobin's q)	474038	1.84	2.43	0.10	0.43	0.92	1.22	1.90	10.32	183.98

Table 3. Country-specific firm value

Panel A of this table reports summary statistics on the country-specific firm value estimated by Eq. (2), in which the log-transformed Tobin's q ratio is regressed on a set of country fixed effects, along with year fixed effect, as a panel regression, separately for positive-FCF and negative-FCF firms. Panel B reports the regression of the country-specific firm value on legal origin (as a proxy for country-level institutions), along with the GDP per capita in log as a control. The GDP data are the average over the same period of 2000-2018. All GDP data except for Taiwan are obtained from The World Bank (https://data.worldbank.org/indicator/NY.GDP.PCAP.KD). The data for Taiwan are from the country's National Statistics web-site (https://eng.stat.gov.tw). The p-values for regressions are based on the White (1980) covariance.

Panel A. Summary statistics

	n	mean	std	min	p25	median	p75	max
Country-specific valuation of positive-FCF firms (global average = 0.276)								
	43	0.000	0.159	-0.390	-0.073	-0.014	0.104	0.469
Country-specific valuation of negative-FCF firms (global average = 0.223)								
	43	0.000	0.194	-0.462	-0.128	-0.010	0.088	0.412

Panel B. Regression on legal origin

Dependent variable: Country-specific firm value

using all sample 43 countries								
	positive-FCF firms				negative-FCF firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	0.030	(0.520)	0.039	(0.408)	0.097	(0.139)	0.115	(0.042)
ln(GDP_pc)			0.040	(0.074)			0.078	(0.003)
R-squared	0.8%		9.0%		5.6%		26.7%	
# observations	43		43		43		43	

using only common law or French civil law countries								
	positive-FCF firms				negative-FCF firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	0.087	(0.076)	0.083	(0.067)	0.171	(0.014)	0.163	(0.003)
ln(GDP_pc)			0.043	(0.013)			0.087	(0.000)
R-squared	9.8%		23.3%		19.1%		46.4%	
# observations	31		31		31		31	

Table 4. Country-specific FCF beta

Panel A of this table reports summary statistics on the country-specific FCF beta estimated by Eq. (3). Specifically, it is the sum of the estimated β and β^C. Panel B reports the regression of the country-specific FCF beta on legal origin (as a proxy for country-level institutions), along with the GDP per capita in log as a control. The GDP data and variable are the same as Table 3. The p-values for regressions are based on the White (1980) covariance.

Panel A. Summary statistics

	n	mean	std	min	p25	median	p75	max
FCF beta of positive-FCF firms (sum of β and β^C)								
	43	0.174	0.045	0.086	0.136	0.171	0.200	0.283
FCF beta of negative-FCF firms (sum of β and β^C)								
	43	-0.098	0.068	-0.282	-0.147	-0.078	-0.042	-0.007

Panel B. Regression on legal origin

	Dependent variable: Country-specific FCF beta							
	using all sample 43 countries							
	positive-FCF firms				negative-FCF firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	0.010	(0.430)	0.011	(0.402)	-0.064	(0.007)	-0.071	(0.000)
In(GDP_pc)			0.003	(0.533)			-0.028	(0.004)
R-squared	1.1%		1.8%		19.9%		42.5%	
# observations	43		43		43		43	

	using only common law or French civil law countries							
	positive-FCF firms				negative-FCF firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	0.018	(0.173)	0.018	(0.159)	-0.083	(0.002)	-0.081	(0.000)
In(GDP_pc)			-0.003	(0.459)			-0.025	(0.033)
R-squared	5.6%		6.6%		30.2%		45.4%	
# observations	31		31		31		31	

Table 5. Country-specific FCF persistence

Panel A of this table reports summary statistics on the country-specific FCF persistence, measured by the conditional probability of same-sign FCF in two consecutive years. Specifically, we keep track of each sample firm over time and code whether the firm has negative FCF two years in a row. We then compute the fractions of those incidences in a country and, using those fractions, we compute Prob(positive FCF_0 | positive FCF_{-1}) and Prob(negative FCF_0 | negative FCF_{-1}). Finally, we average them over the study period within each country.

Panel B reports the regression of the country-specific FCF persistence on legal origin (as a proxy for country-level institutions), along with the GDP per capita in log as a control. The GDP data and variable are the same as Tables 3 and 4. The p-values for regressions are based on the White (1980) covariance.

Panel A. Summary statistics

	n	mean	std	min	p25	median	p75	max
Persistence of positive FCF: Prob($FCF_t > 0$ | $FCF_{t-1} > 0$)								
	43	0.811	0.039	0.717	0.779	0.821	0.841	0.866
Persistence of negative FCF: Prob($FCF_t \le 0$ | $FCF_{t-1} \le 0$)								
	43	0.638	0.088	0.446	0.579	0.629	0.673	0.889

Panel B. Regression on legal origin

	Dependent variable: Conditional Probability of FCF							
	using all sample 43 countries							
	Prob (pos FCF_0 | pos FCF_{-1})				Prob (neg FCF_0 | neg FCF_{-1})			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	-0.020	(0.107)	-0.019	(0.140)	0.086	(0.006)	0.093	(0.001)
In(GDP_pc)			0.004	(0.385)			0.031	(0.003)
R-squared	5.6%		7.0%		21.7%		38.4%	
# observations	43		43		43		43	

	using only common law or French civil law countries							
	Prob (pos FCF_0 | pos FCF_{-1})				Prob (neg FCF_0 | neg FCF_{-1})			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	-0.028	(0.040)	-0.028	(0.038)	0.087	(0.009)	0.083	(0.002)
In(GDP_pc)			0.002	(0.731)			0.038	(0.001)
R-squared	13.0%		13.2%		21.9%		45.6%	
# observations	31		31		31		31	

Table 6. Analysis of small and large firms

Panel A of this table reports the regression of country-specific firm value, estimated separately for small and large firms, on legal origin. Panel B reports the regression of the country-specific FCF beta, estimated separately for small and large firms, on legal origin. Other than that, the two panels use the same specification as Panel B of Tables 3 and 4, respectively. The two size-sorted subsamples are constructed each year in each country by the median total assets. The p-values for regressions are based on the White (1980) covariance.

Panel A. Country-specific firm value – small vs. large firms

	Dependent variable: Country-specific firm value							
	using all sample 43 countries							
	small firms				large firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	0.102	(0.169)	0.122	(0.069)	0.021	(0.623)	0.027	(0.540)
ln(GDP_pc)			0.088	(0.010)			0.024	(0.130)
R-squared	4.1%		21.7%		0.6%		5.2%	
# observations	43		43		43		43	

	using only common law or French civil law countries							
	small firms				large firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	0.203	(0.012)	0.194	(0.003)	0.048	(0.268)	0.046	(0.276)
ln(GDP_pc)			0.100	(0.000)			0.022	(0.125)
R-squared	18.9%		44.6%		4.3%		9.6%	
# observations	31		31		31		31	

Panel B. Country-specific FCF beta – small vs. large firms

	Dependent variable: Country-specific FCF beta							
	using all sample 43 countries							
	small firms				large firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	-0.013	(0.217)	-0.014	(0.212)	-0.005	(0.024)	-0.005	(0.020)
ln(GDP_pc)			-0.003	(0.283)			0.000	(0.793)
R-squared	6.3%		8.3%		11.3%		11.5%	
# observations	43		43		43		43	

	using only common law or French civil law countries							
	small firms				large firms			
	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)	Est.	(p-val)
Common law	-0.012	(0.263)	-0.012	(0.258)	-0.006	(0.011)	-0.006	(0.009)
ln(GDP_pc)			-0.005	(0.195)			0.001	(0.369)
R-squared	4.7%		8.5%		19.7%		22.0%	
# observations	31		31		31		31	

Table 7. Country effects vs. industry effects

Panel A of this table reports the regression of a stack of country effects and industry effects in FCF, both estimated by Eq. (4), on a dummy variable for country effects (D_{CE}), along with year fixed effects. Panel B reports the regression of a stack of country effects and industry effects in firm value, both estimated by Eq. (6), on a dummy variable for country effects (D_{CE}), along with year fixed effects. That is, both Panels A and B report the results of Eq. (5) but with different dependent variables. In both panels, the error terms are allowed to cluster within the same country or the same industry.

Panel A. Regression of country and industry effects in FCF

dependent variable: country effects or industry effects in FCF

	positive-FCF firms		negative-FCF firms	
	Est.	(p-val)	Est.	(p-val)
D_{CE}	0.015	(0.440)	0.082	(0.067)
year FE	yes		yes	
R-squared	0.9%		2.9%	
# observations	1596		1596	

Panel B. Regression of country and industry effects in firm value

dependent variable: country effects or industry effects in firm value

	positive-FCF firms		negative-FCF firms	
regressor	Est.	(p-val)	Est.	(p-val)
D_{CE}	-0.001	(0.982)	0.131	(0.001)
year FE	yes		yes	
R-squared	2.4%		4.9%	
# observations	1596		1596	

Figure 1. Fraction of negative-FCF firms in sample countries
This figure reports the average fraction of negative-FCF firms in our sample countries (red bar) along with the time-series standard deviation (black dash line). The average fraction is over the sample period of 2000-2018 for each country. These averages are also reported in Table 1.
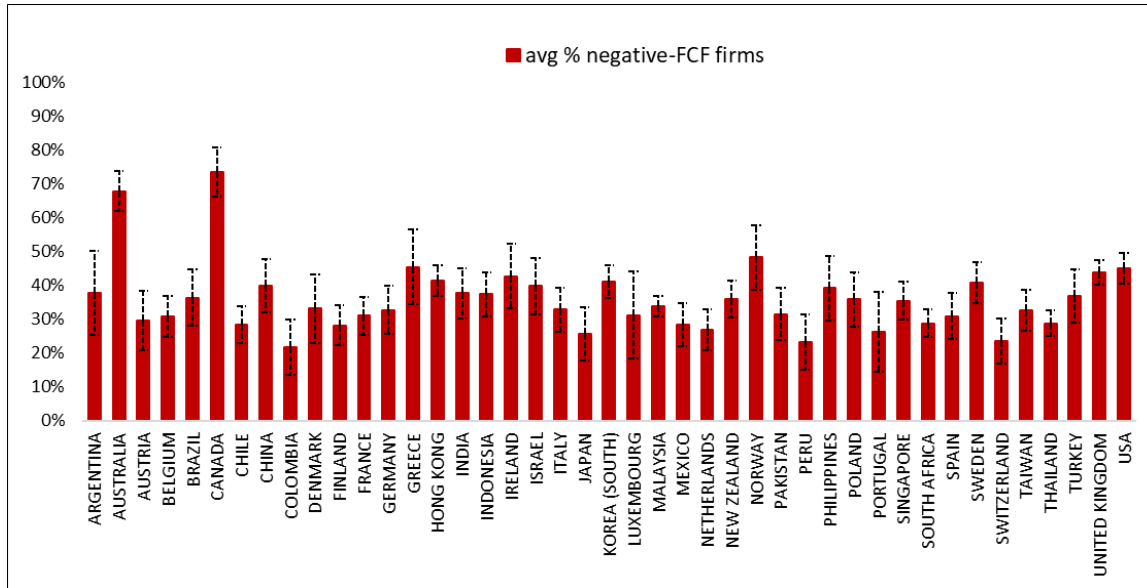
Figure 2. Distributions of FCF, log-transformed FCF, and log-transformed firm value

This figure reports the log transformation of FCF, from Panel A to Panel B. With positive FCF, it is ln(FCF). With non-positive (i.e., including zero) FCF, it is $-ln(-FCF^*)$, in which FCF^* is the original FCF moved left by the minimum FCF in absolute terms among negative FCF in the country. For example, if a country's closest-to-zero FCF among negative FCF is –0.0001, all non-positive (i.e., including zero) FCF values are moved to the left by 0.0001. Positive-FCF firms are in blue, and negative-FCF firms are in red. Panel C is the distribution of log-transformed firm value (Tobin's q). Positive-FCF firms are in blue, and negative-FCF firms are in red.

Panel A. Distribution of FCF
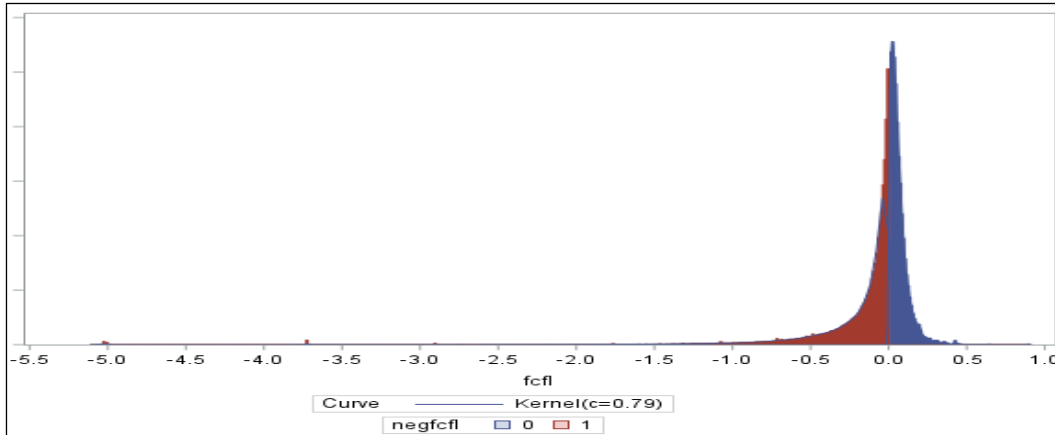
Panel B. Distribution of log-transformed FCF
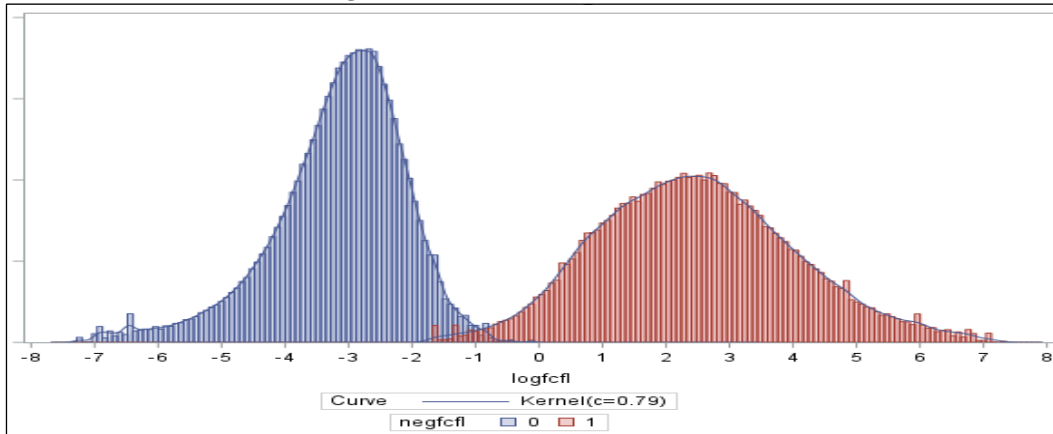
Panel C. Distribution of log-transformed firm value
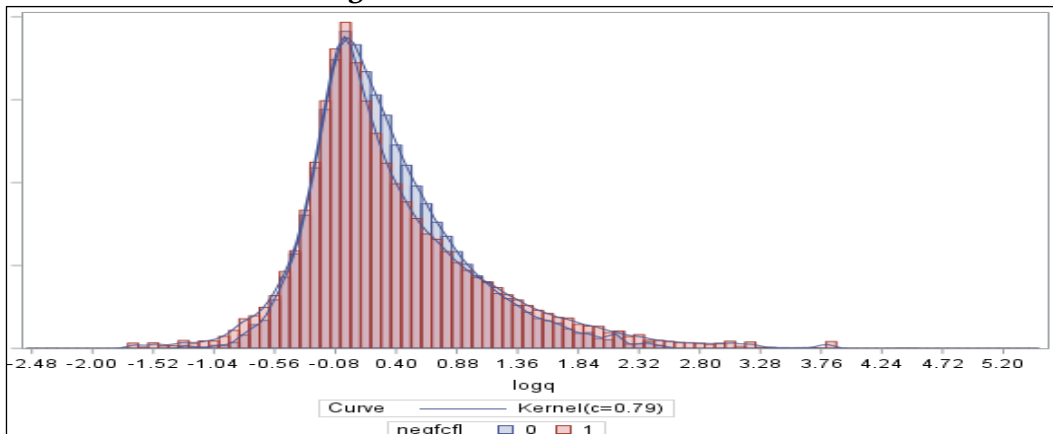
Figure 3. Country-specific firm value
This figure reports the cross-country distribution of firm value estimated by Eq. (2).
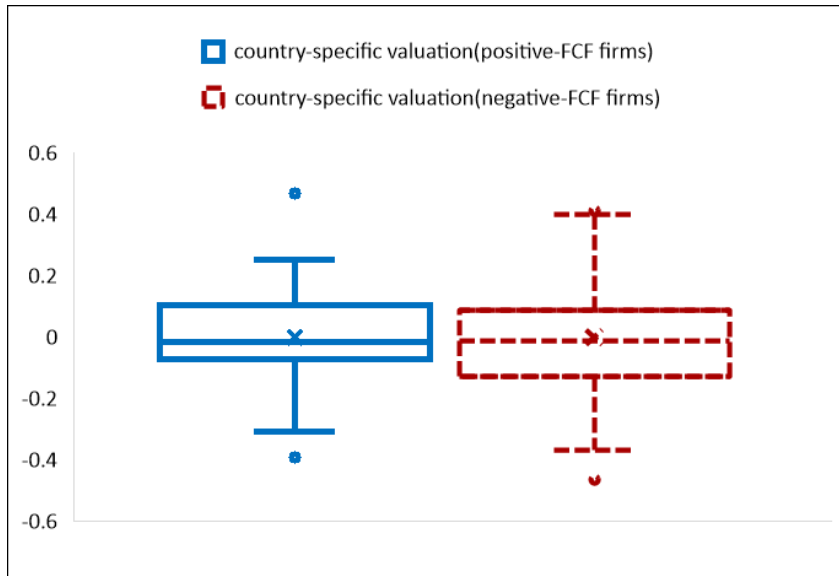
Figure 4. Country-specific FCF beta

Panel A reports the cross-country distribution of FCF beta estimated by Eq. (3). Panel B reports the relation of the FCF beta to the country-specific firm value.

Panel A. Cross-country distribution of FCF beta
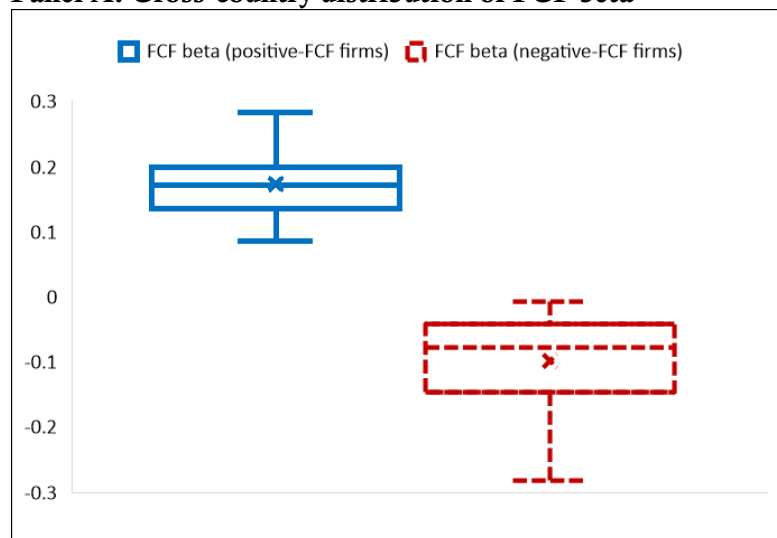
Panel B. Cross-country relation between firm value (from Figure 3) and FCF beta
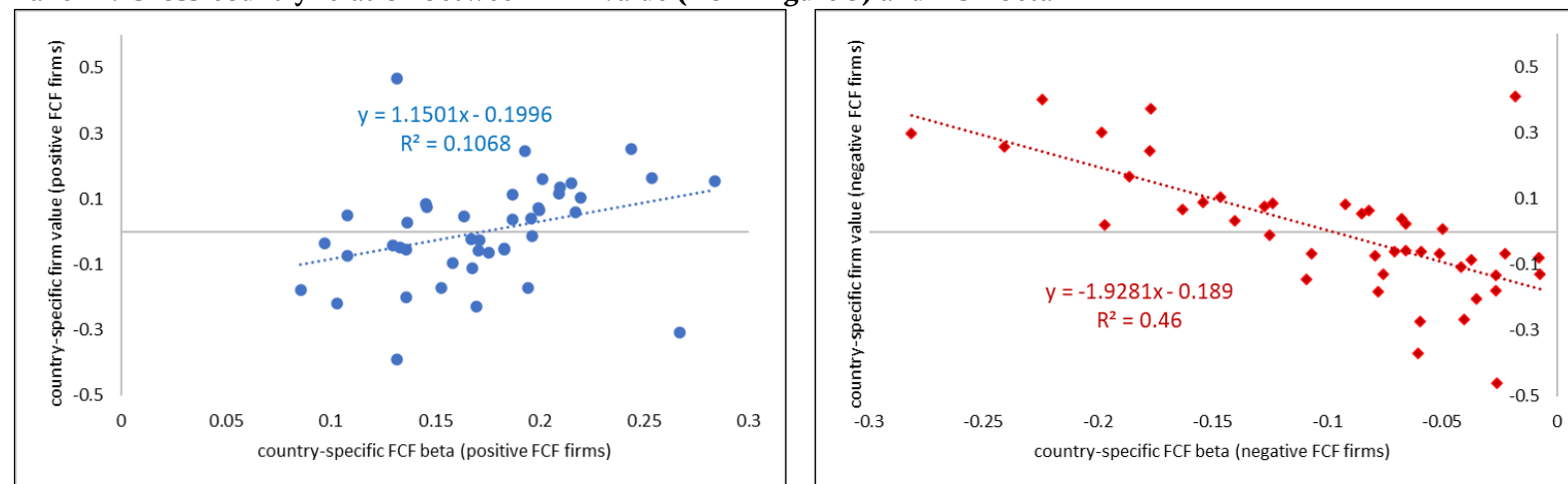
Figure 5. Country-specific FCF persistence
Panel A reports the cross-country distribution of FCF persistence. Panel B reports the relation of the FCF persistence to the country-specific firm value.

Panel A. Cross-country distribution of FCF persistence
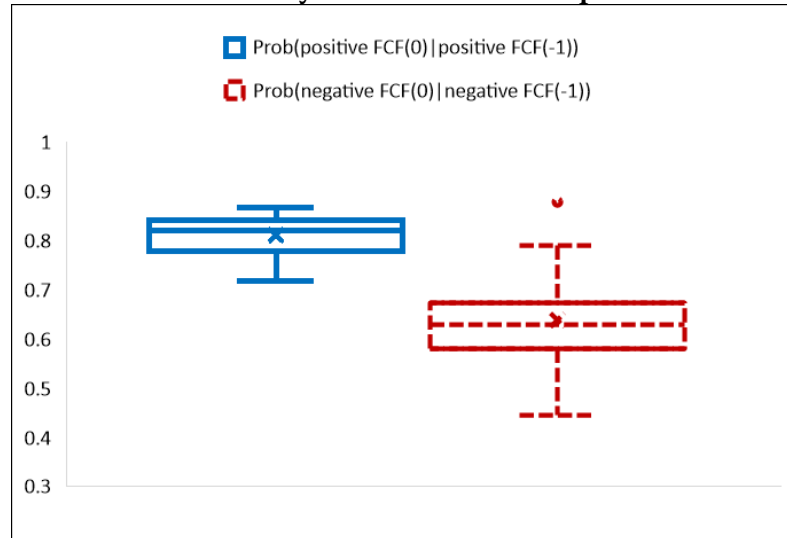
Panel B. Cross-country relation between firm value (from Figure 3) and FCF persistence
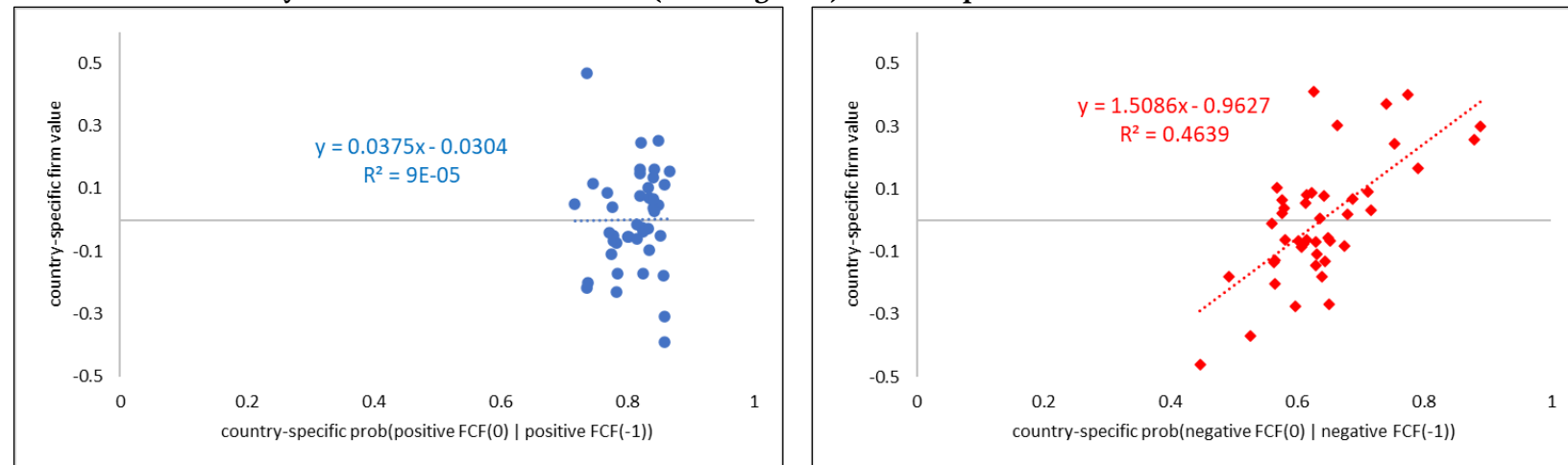
Figure 6. World Bank Doing Business Indicators

Panel A reports the coefficients and t-statistics of the univariate cross-country regression of the country-specific firm value on each of the World Bank's 11 Doing Business Indicators (DBIs). Panel B is for the country-specific FCF beta in lieu of firm value, and Panel C for the country-specific FCF persistence. Before regression, each DBI is averaged within a country over our study period (2000-2018, within which each DBI is available) and then standardized by the cross-country average and standard deviation. As a result, all DBIs have a mean value of zero with a standard deviation of one. The regressions are estimated separately for positive-FCF and negative-FCF firms. The t-statistics are based on the White (1980) covariance.
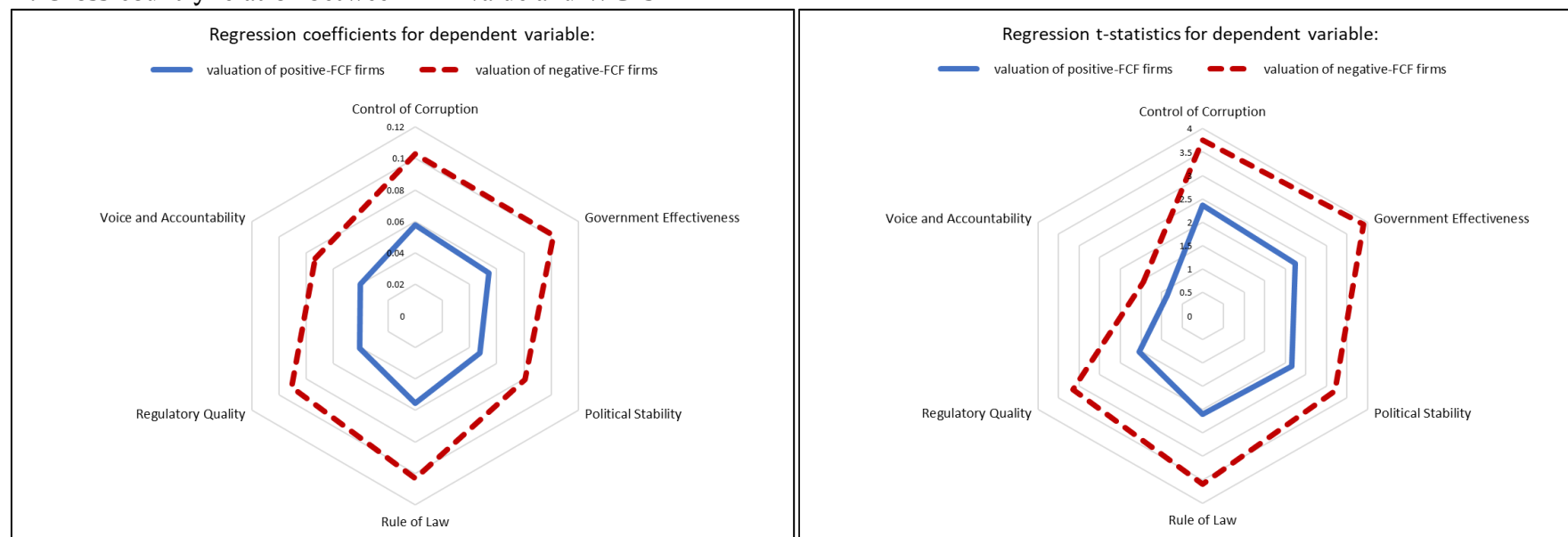
A. Cross-country relation between firm value and DBIs
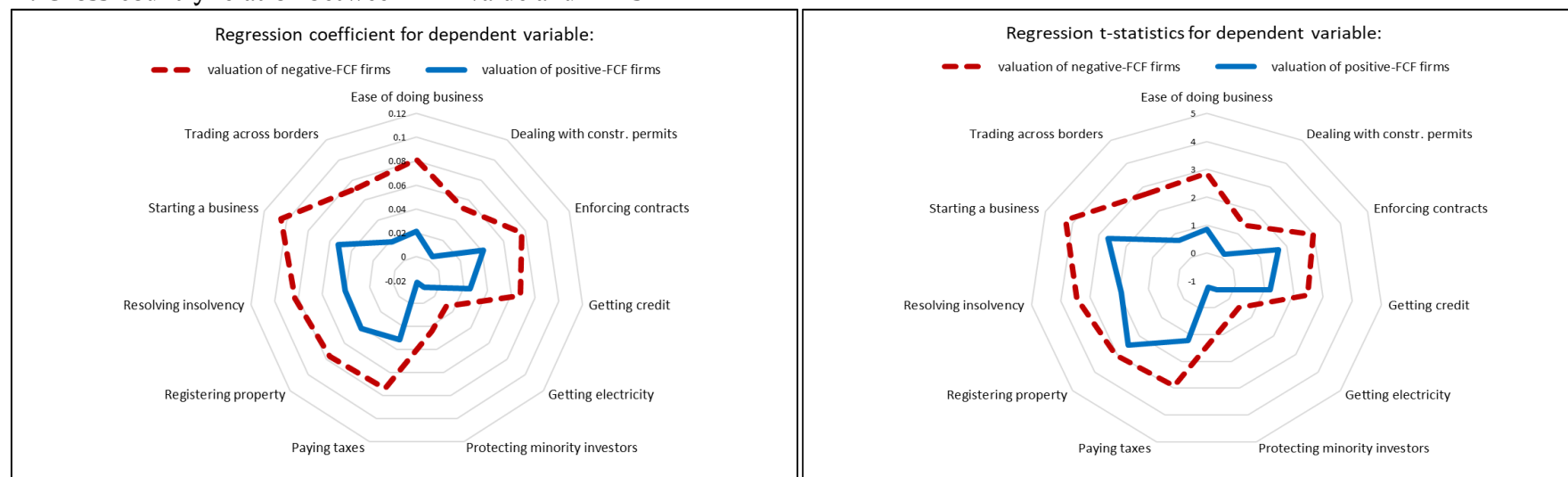
Figure 6. cont.

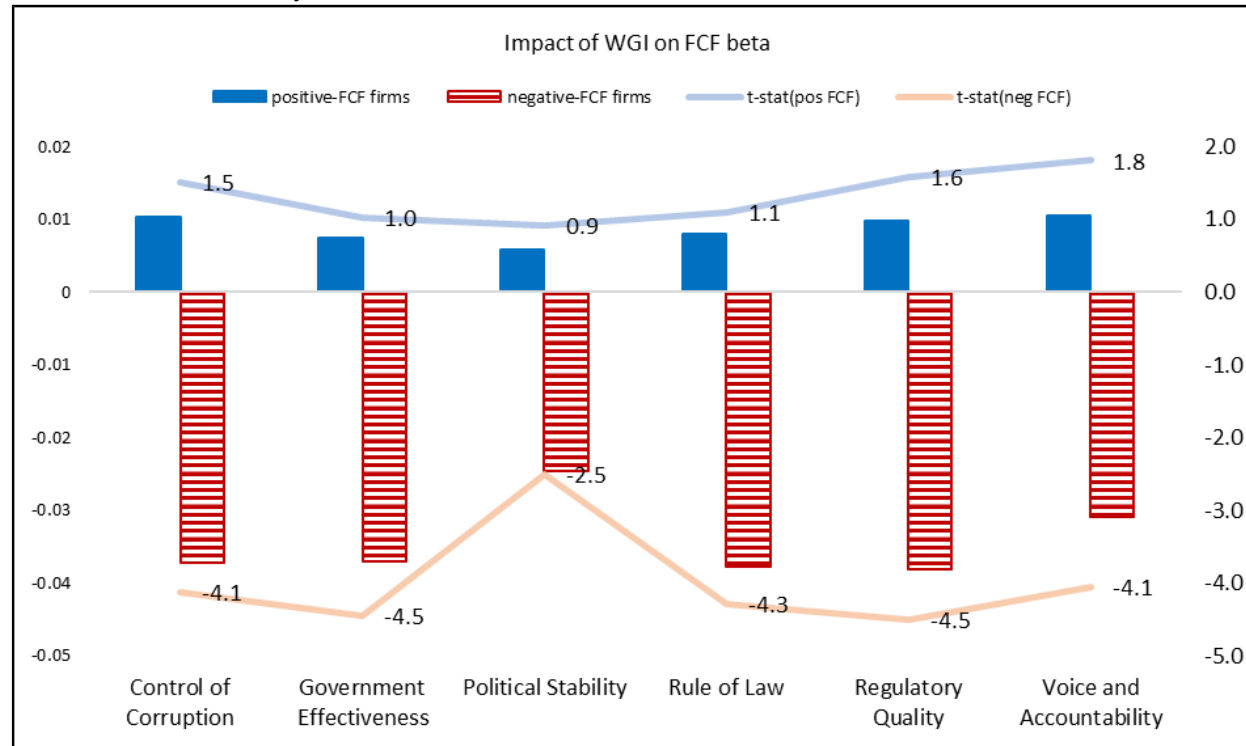**Panel B. Cross-country relation between FCF beta and DBIs**
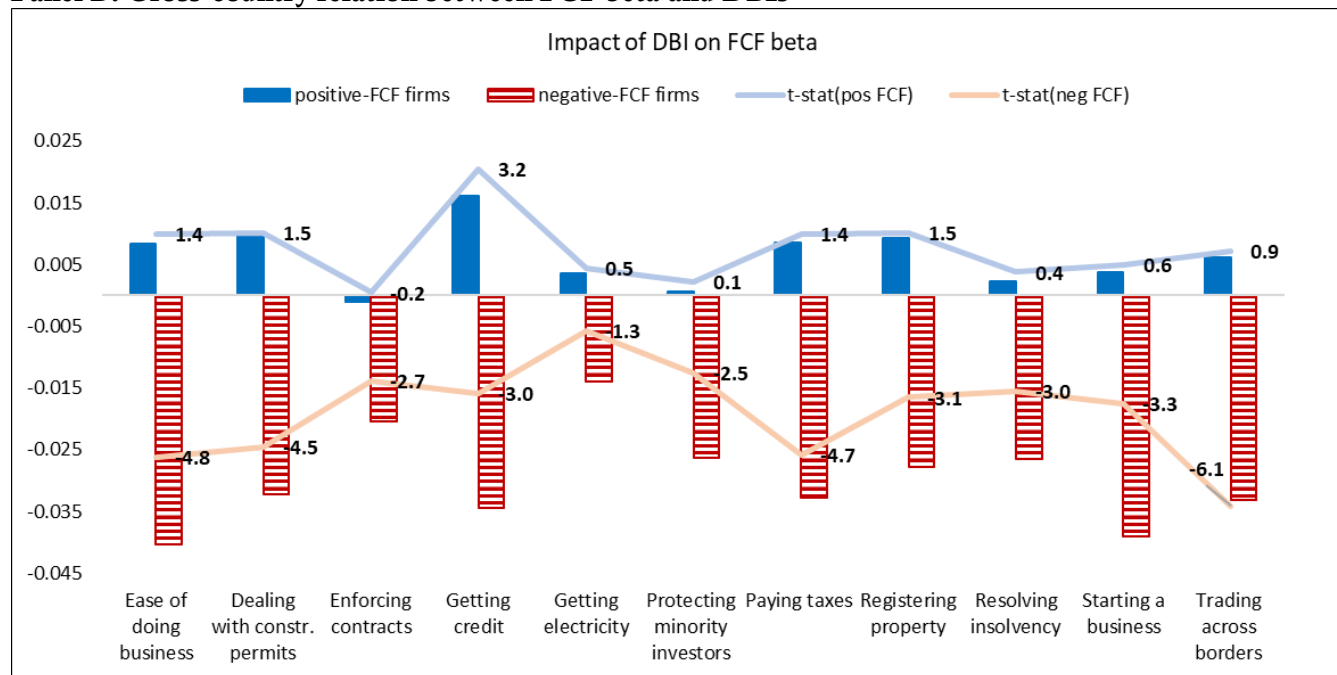
Figure 6. cont.

Panel C. Cross-country relation between FCF persistence and DBIs
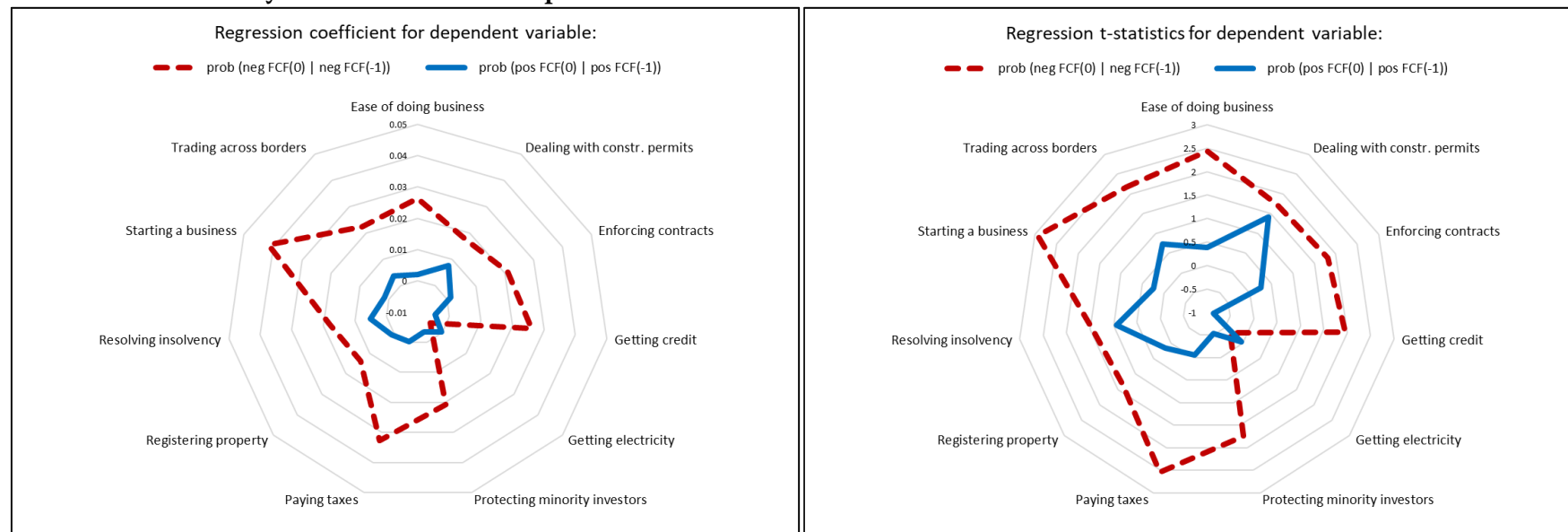
Figure 7. World Bank Worldwide Governance Indicators

Panel A reports the coefficients and t-statistics of the univariate cross-country regression of the country-specific firm value on each of the World Bank's 6 Worldwide Governance Indicators (WGIs). Panel B is for the country-specific FCF beta in lieu of firm value, and Panel C for the country-specific FCF persistence. Before regression, each WGI is averaged within a country over our study period (2000-2018, within which each WGI is available) and then standardized by the cross-country average and standard deviation. As a result, all WGIs have a mean value of zero with a standard deviation of one. The regressions are estimated separately for positive-FCF and negative-FCF firms. The t-statistics are based on the White (1980) covariance.

A. Cross-country relation between firm value and WGIs

Figure 7. cont.

Panel B. Cross-country relation between FCF beta and WGIs

Figure 7. cont.
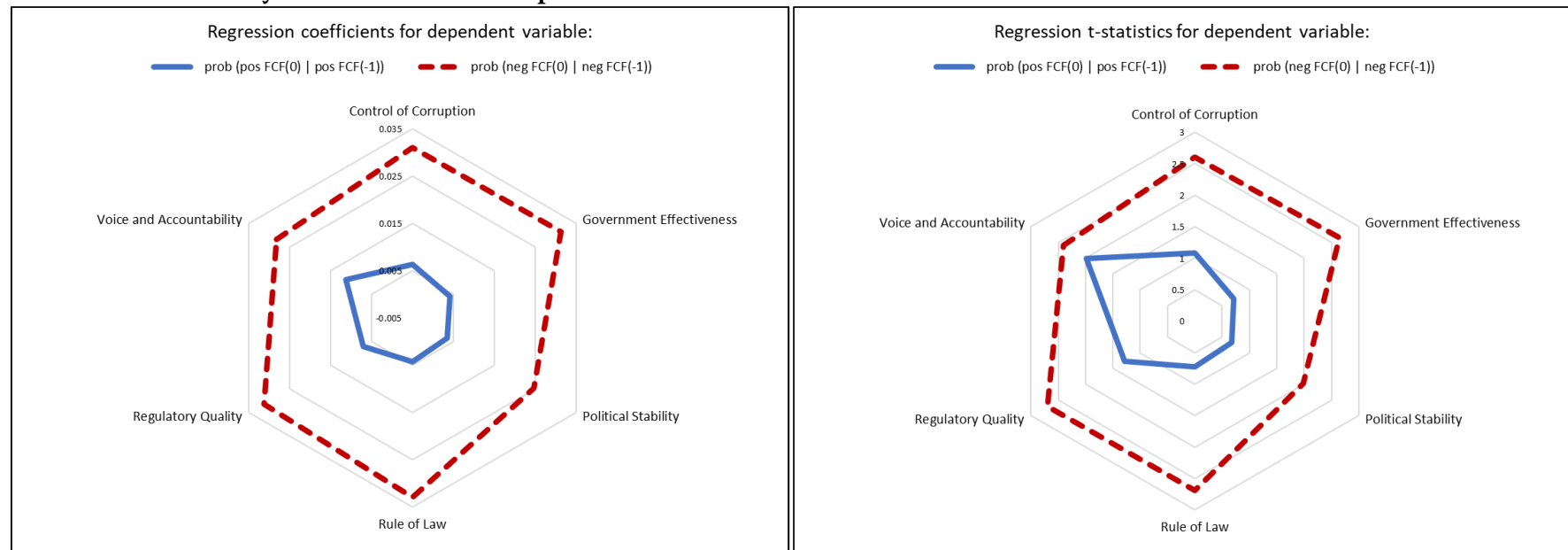**Panel C. Cross-country relation between FCF persistence and DBIs**

Figure 8. Distributions of firm value and firm size

Panel A reports the distribution of log-transformed firm size (total assets). For Panel B, we sort all (i.e., both positive- and negative-FCF) sample firms into quintiles by their total assets, each year in each country, and then report the fraction of each quintile in each of the pooled FCF-sorted subsamples. Positive-FCF firms are in blue, and negative-FCF firms are in red.

Panel A. Distribution of log-transformed firm size
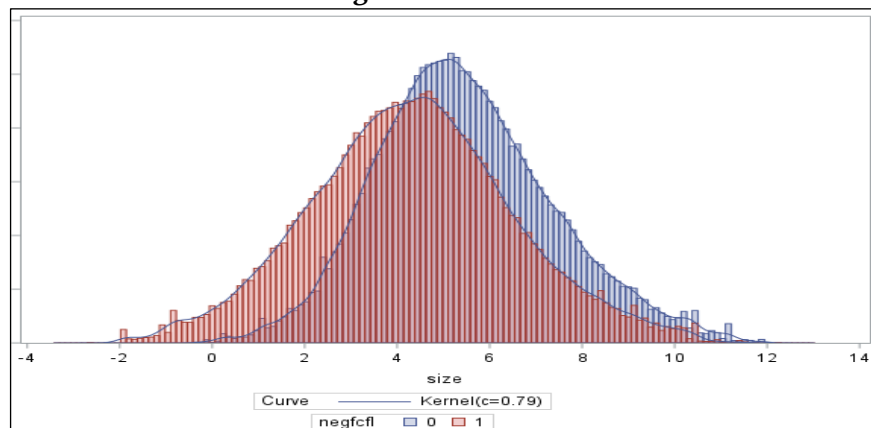
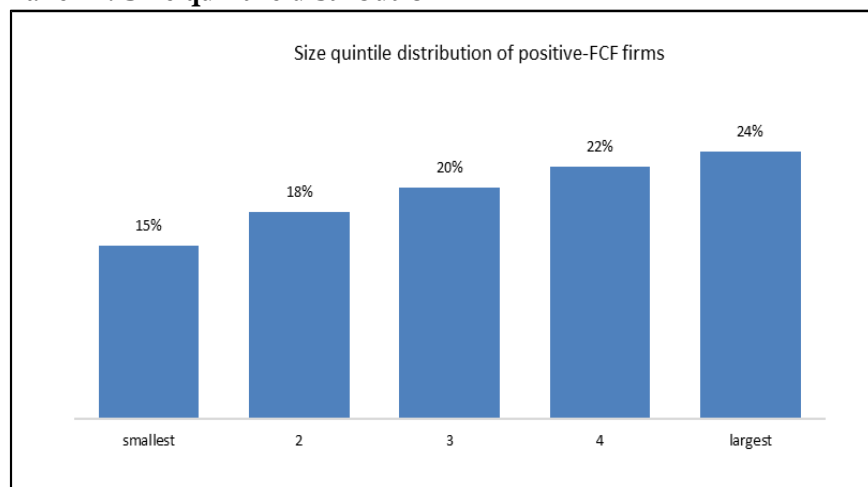**Panel B. Size quintile distribution**
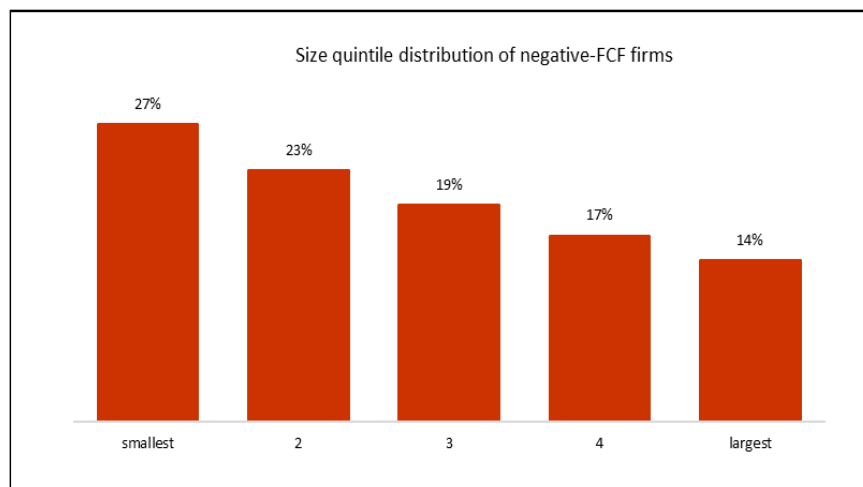
Figure 9. Small vs. large firms

Panels A and B reports the country-specific firm value and the FCF beta each of which is estimated by Eq.'s (1) and (2), respectively, and separately for small and large firms. The two size-sorted subsamples are constructed by the median total assets, each year in each country.

Panel A. Country-specific firm value of small and large firms
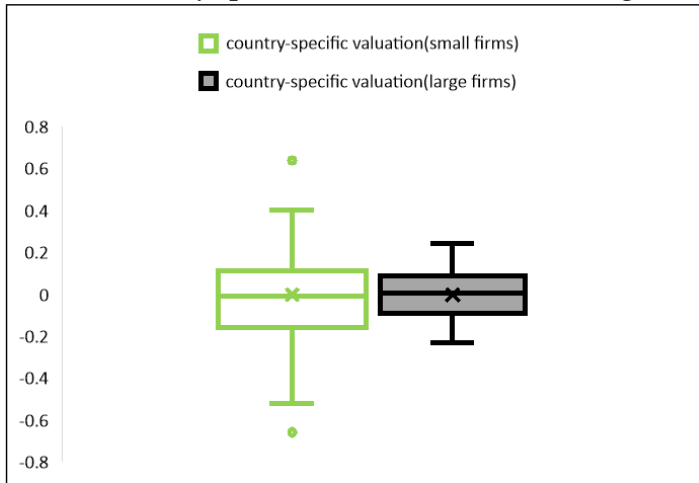
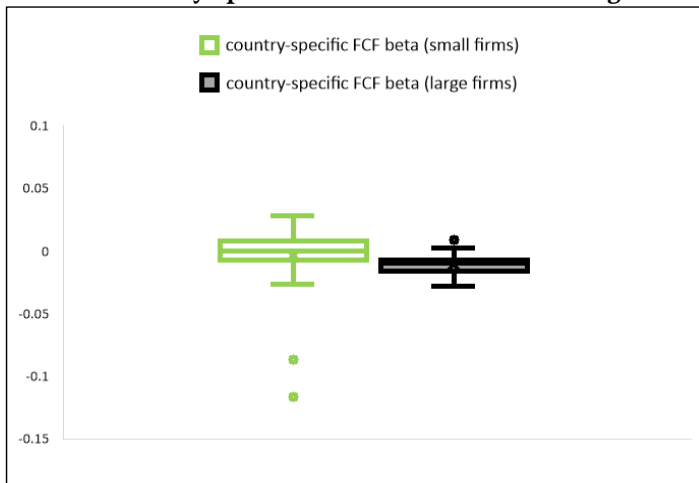## Panel B. Country-specific FCF beta of small and large firms

Figure 10. Country effects vs. industry effects in FCF

The first two panels report the country (top) and industry (middle) effects in FCF, which are estimated by Eq. (4). Specifically, a given year's average country effect is: $CE_t^{avg} = \sum CE_t^C / nc_t$, where $CE_t^C = |\alpha_t^C|$ and nc_t is the number of countries in year t. Similarly, a given year's average industry effect is: $IE_t^{avg} = \sum IE_t^I / ni_t$, where $IE_t^I = |\alpha_t^I|$ and ni_t is the number of industries in year t. The third panel reports the magnitude of firm-specific components in FCF, which is computed as: $1 - R^2$ of Eq. (4).
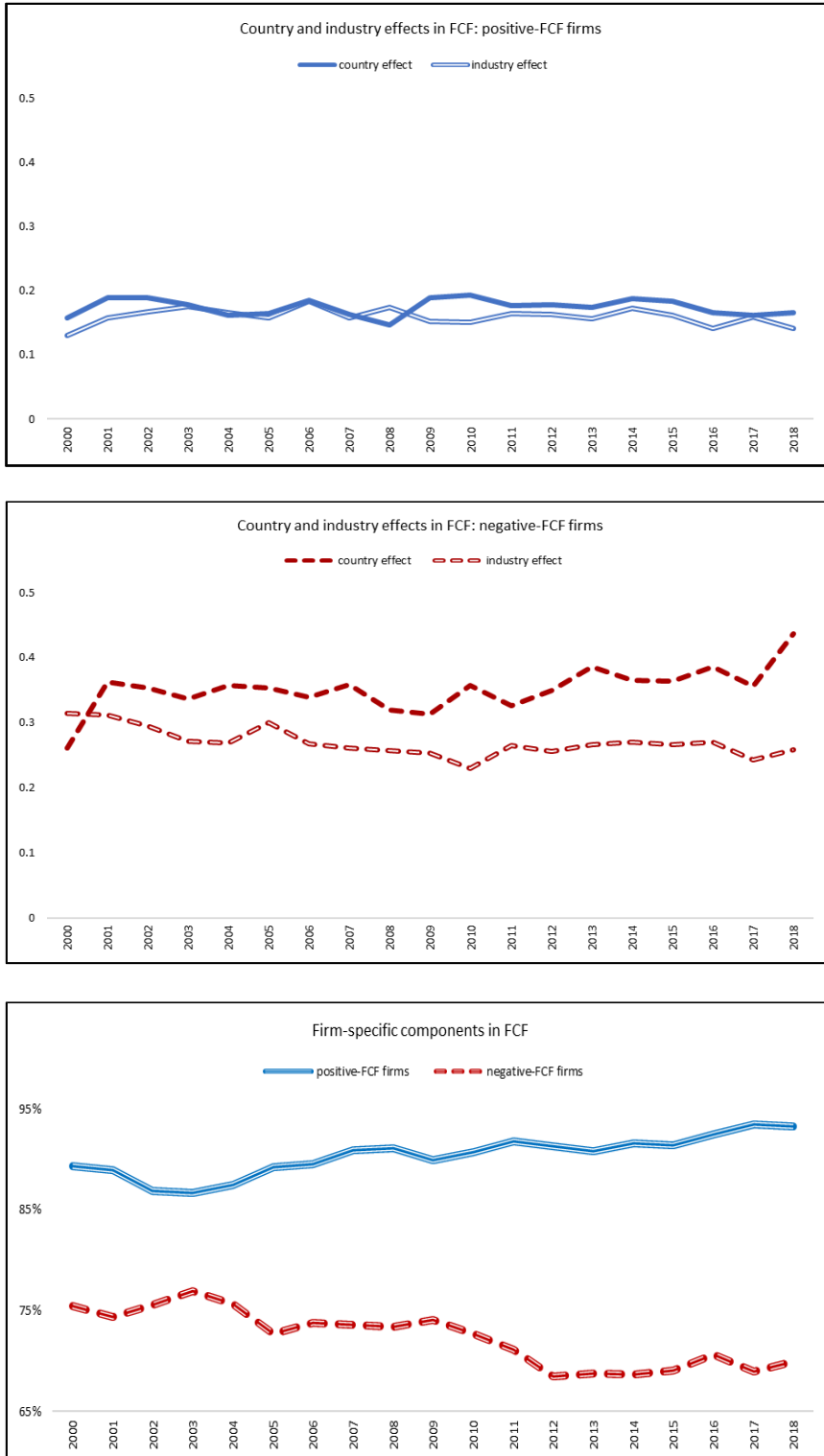
Figure 11. Country effects vs. industry effects in firm value

The two panels below reports the country (top) and industry (bottom) effects in FCF, which are estimated by Eq. (6). Specifically, a given year's average country effect is: $CE_t^{avg} = \sum CE_t^C / nc_t$, where $CE_t^C = |\alpha_t^C| + |\beta_t^C|$ and nc_t is the number of countries in year t. Similarly, a given year's average industry effect is: $IE_t^{avg} = \sum IE_t^I / ni_t$, where $IE_t^I = |\alpha_t^I| + |\beta_t^I|$ and ni_t is the number of industries in year t.

Country and industry effects in firm value: positive-FCF firms

Country and industry effects in firm value: negative-FCF firms