What Explains Cross-Country Difference in Corporate Valuations? Growth Opportunities or Profitability?

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Abstract

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Keywords: Valuation; Country; Growth opportunities; Free cashflow
JEL classification: F30; F65; G30

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1. Introduction

Countries employ different mixes of institutions in pursuit of economic growth. It is thus crucial to know who are getting ahead and what institutions are behind their successes (Morck 2014). Can stock prices serve as a measure of such economic progress? While plausible, the answer depends on the extent to which a high valuation of corporate equities in a country is associated with efficient allocation of capital and resources. In fact, recent studies cast doubt on this *functional* efficiency of stock price by documenting a growing role of profitability, which amounts to economic rents, in corporate valuation (Corhay, Kung, and Schmid 2000; Lee, Shin, and Stulz 2021; Choi and Lee 2021). Consequently, when a country has a higher level of stock prices than another country, we need to ask—before concluding the former as the winner—how much of it is due to capital and resources being properly allocated to corporate investment and growth opportunities, as opposed to corporate profits being capitalized.

In this paper, we examine the relative importance between growth opportunities and profitability in a country's overall corporate valuation. More precisely, we ask whether a higher valuation of corporate equities in a country is attributable to better allocation of capital across firms toward growth opportunities or more cumulation of capital within a firm as profits. By better allocation of capital, we mean that companies who need external funding *for a reason* indeed obtain it. This cross-sectional capital allocation in a country can be proxied by the relation between firm-level free cashflow (FCF)—defined as CF after investment—and firm-level Tobin's q within the country. Companies in genuine need of external funding would have low internal CF but valuable investment opportunities. When capital is allocated to those companies and supports their investment, the FCF will fall due to more investments but the q will rise as the growth prospects materialize. If such a negative cross-sectional relation between FCF and q—

which we call the FCF beta—prevails in a country, it means that the country's overall valuation is the one that attracts and is supported by external funding. Hence, a sign of efficient capital allocation contributing to the country's overall firm value.[1]

More cumulation of capital within a firm as profits and its role in the country's overall valuation can also be proxied by the FCF beta. To see this, note that companies could have limited investment opportunities and their q ratios could be supported by instead profitability. Nothing is wrong with this and their profits could be paid out and channeled to the investments of other companies. However, if a country's FCF beta is positive, it means that the country's overall valuation is determined mainly by the cumulation of internal funds. Should the FCF of those profitable firms flow eventually to other firms via payouts, those other firms with good investment opportunities but little internal CF would benefit and their heightened q would push the country's FCF beta toward negative. In a nutshell, the FCF beta is a proxy for the relative importance between growth opportunities (cross-firm capital allocation) and profits (within-firm capital cumulation) in a country's overall corporate valuation, in which the two are pitted and a net effect arises.

By higher valuation, we mean that the country-wide *and* country-specific valuation level of corporate equities is higher in the cross-section of countries. We measure it using the average valuation across firms in a country while controlling for the global and industry effects (see Section 4.1 for details). This approach ensures that cross-country differences are not trivially reduced to different industry compositions and, hence, country remains a meaningful unit of analysis.

To sum up, our empirical analysis is to associate the country-specific valuation with the

[1] See Section 2 for a detailed formulation of our research question.

country-specific FCF beta. In estimating the two, we do not just use all firms in a country; we also estimate them separately for the companies for which growth opportunities are the main value driver ("growth" firms, hereafter), and for those whose value is based more on profitability ("mature" firms, hereafter). By doing so, we observe the relation of a country's FCF beta to its valuation in each group. This separation allows a clearer picture of which one—between the relation of capital allocation to corporate valuation and the relation of capital cumulation to corporate valuation—is better supported by data.

Using firm-level data from 43 countries for the period of 1992-2018, we find that countries with more negative FCF beta have a higher level of corporate valuation. That is, countries in which corporate growth opportunities, as opposed to profitability, are the main value driver have a higher valuation. To rephrase again, the allocation of capital across firms in a country—i.e., external funding—has a greater country-wide valuation effect than the cumulation of capital within individual firms—i.e., internal funds. Further supporting this interpretation, the relation between FCF beta and country-wide valuation is more negative for growth firms. However, when we only use mature firms, the relation is positive yet insignificant.

For the separation of sample firms into growth- and mature-firm subgroups, we use firm size. Specifically, within a country each year, we sort companies into two groups by their total assets and consider the bottom group to be growth firms, and the top group to be mature ones. Certainly, it is an imperfect way of identifying companies with different valuation focal points. Equally certain, however, firm size is highly correlated with other possible sorting keys and, compared with them, it is the least controversial and most readily available variable in a cross-country study with firm-level data. We further mitigate the concern by employing more extreme groupings. The idea is, if firm size is an acceptable proxy for a company's value driver between

growth opportunities and profitability, then the bottom, say, quintile firms will be more growth-oriented than the bottom half firms. Similarly, the top quintile firms would be more profit-generating than the top half firms.

This prediction is indeed borne out by data. Specifically, the relation between FCF beta and country-wide valuation is more negative with more extreme subgroups (i.e., terciles, quintiles, and deciles). For example, the R-squared of the regression of the country-wide valuation on the FCF beta increases from 22% to 34% when we change the definition of growth firms from the bottom half to the bottom decile firms. Interestingly, the relation between FCF beta and country-wide valuation with mature firms remains insignificant and positive regardless of their definition. It thus confirms that corporate valuations vary across countries mainly because growth opportunities are better funded in some countries than in others, not because profits are better capitalized in some countries than in others.

A useful perspective arises when the analysis is repeated at the industry level. We find a positive cross-industry relation between the FCF beta estimated within an industry across countries and the corporate valuations also estimated within an industry across countries. The relation is significant only when we examine growth and mature firms separately, and it is much stronger with mature companies. Thus, an industry valued higher than another should be the one in which profits are more important than growth opportunities in corporate valuation. Put differently, the contribution of capital allocation across firms to their overall valuation is more a country-specific phenomenon.

It would be a mistake if one does not take into account the unique growth profile of China in an international study like ours. According to Song, Storesletten, and Zilibotti (2011), Chinese entrepreneurial companies lack access to external funding and rely on internal savings for their

investment. In contrast, less productive state-owned companies tap external financial markets for their survival.[2] This alludes to a positive FCF beta among the Chinese growth companies and a negative FCF beta when estimated across the country's mature companies. We verify both predictions in the data. Still, the corporate valuations in China are by far the highest across countries and, therefore, the country stands as an "outlier" to our FCF beta-based narrative. As an illustration, the R-squared of the regression of the country-wide valuation on the FCF beta—both estimated only with growth firms—is 43% without China, which compares with an R-squared of 22% when China is included in the analysis. While a fascinating research topic, we believe that an in-depth analysis of the country-wide valuation effects of capital allocation and cumulation in the Chinese corporate sector is beyond the scope of this paper.

It is crucial to note that the country-wide valuation effects of growth opportunities (i.e., cross-firm capital allocation) and profitability (i.e., within-firm capital cumulation) are both contingent on a well-functioning governance system in a country. More specifically, a negative FCF beta would obtain only when investors are assured of a fair return on their investment in growth firms. Similarly, a positive FCF beta would arise only with a set of governance schemes that discipline mature companies to pay a fair share of FCF to outside investors. Therefore, as a country's corporate governance system improves, its FCF beta should be more negative to the extent that corporate growth opportunities are efficiently funded, and more positive to the extent that corporate profits are properly paid out. Given our earlier results of growth opportunities being the dominant value driver for the country's overall valuation level, we

[2] According to the authors, those low-productive companies shrink over time and domestic capital goes abroad, thereby creating a capital surplus. See also Ding, Kim, and Zhang (2018) and the references therein for more information about Chinese corporate investment and financing. See also Xiong (2019) and the references therein for studies on the uniqueness of the Chinese economic growth.

expect a negative FCF beta to be more pronounced in better-governed countries. Consistent with this prediction, we find that the FCF beta is more negative in common law countries than in civil law countries. The difference is stronger with growth firms only and when the comparison is made between common law countries and French civil law countries.

In summary, corporate valuation varies across countries due to the difference in the way that corporate investment and growth opportunities are externally funded in those countries. Specifically, the country-wide stock prices are higher, the more efficiently capital flows towards companies in genuine need of external funding. We also find that the other value driver—i.e., profitability or the cumulation of capital within individual firms—explains the industry-wide valuation level. All in all, our results indicate that stock prices—especially those of small-sized, growth-focused companies—reflect the allocation of capital in a country and can serve as an acceptable measure of the country's economic progress. At the same time, our results imply that the stock prices of big companies in a country are not necessarily representative of how well the country as a whole is doing economically. Rather, those large firms and their profits represent the overall valuation of the industry they belong to.

Our paper is related to Bekaert, Harvey, Lundblad, and Siegel (2007) who devise a country-specific measure of corporate growth opportunities. In essence, their measure is a weighted average of global industry PE ratios within a country, which means that the authors consider country no more than a particular packaging of industries. We are different from their study in that we seek a genuinely country-specific metric from which the industry effects are removed. Another difference is that we do not measure growth opportunities per se; instead, we measure the extent to which a country's corporate valuations are driven by growth opportunities and their external funding.

In another paper, the authors say "… firms within the same industry are most likely to have similar growth opportunities…" (Bekaert, Harvey, Lundblad, and Siegel 2011; p. 3842), which implies that growth opportunities play a larger role in industry valuation than in country valuation. While agreeing to this notion, we stress that we are asking a different question in this paper. Namely, is an industry (country) whose valuation is driven more by growth options than by profits valued higher than another industry (country)?

The other literature to which our paper is related is the international studies that build on the q theory. McLean, Zhang, and Zhao (2012) in particular show that the investment sensitivity of q is stronger in better governed countries, whereas the investment sensitivity of CF is weaker in those countries. Our FCF beta is different from those sensitivities as it is about how a given q ratio is supported by investment opportunities and profitability. That is, unlike the q theory that associates q and CF with subsequent investment, our FCF beta links q to contemporaneous CF and investment.[3] Thus, our contribution to this literature is to shed new light on the connection between q and CF, along with the one between q and investment, and to examine how the net effect of the two is related to the overall valuation level of a country's corporate equities.

This paper proceeds as follows. Section 2 formulates our research question and Section 3 explains the sample and data. Section 4 reports the main empirical results. Section 5 provides the robustness checks. Section 6 compares the FCF beta with country-level governance measures. Section 7 concludes the paper.

[3] To be precise, the q theory states: Investment $_t$ = q $_{t-1}$ + CF $_{t-1}$, whereas our paper posits: q $_t$ = CF $_t$ – Investment $_t$ ≡ FCF $_t$. In our approach, any positive relation between CF and Investment, either due to financial constraints (e.g., Fazzari, Hubbard, and Petersen 1988) or as a proxy for investment opportunities (e.g., Poterba 1988; Gomes 2001; Alti 2003), would not affect the FCF beta estimate.

2. Formulation of research question

Consider firm i and its valuation, V_i, in which the global and industry effects are already controlled. (The specific method of controlling for those non-country effects is detailed in Section 4.1). When this firm belongs to country c together with n-1 other firms, the country-wide and country-specific valuation, V_c, is defined as:

$$V_c \equiv \frac{1}{n}\sum_1^n V_i = \bar{V}. \quad (1)$$

That is, the country-wide and country-specific valuation is the industry-neutral average firm value across companies in the country.

We think of V_i as a function of firm i's growth opportunities (GO_i) and profits (P_i), and we are interested in the relative importance between the two in the country-wide valuation, V_c. More specifically, we want to know how well corporate growth opportunities are externally funded in a country and how much of this cross-firm capital allocation leads to the country-wide valuation. Conversely, we want to know how much of corporate profits are left in individual firms and how much of this within-firm capital cumulation leads to the country-wide valuation.

This inquiry can be operationalized in the following cross-sectional equation in a country:

$$V_i = \alpha + \beta_1 GO_i + \beta_2 P_i + \varepsilon, \quad (2)$$

or equivalently,

$$\bar{V} = \alpha + \beta_1 \overline{GO} + \beta_2 \bar{P}, \quad (3)$$

in which we can compare β_1 and β_2 to determine the relative importance between growth opportunities and profits in the country-wide valuation.

Given our ideas about the way that growth opportunities and profits are related to the country-wide valuation, β_1 should be the one about the country-wide valuation effect of the funds that are externally allocated across firms, whereas β_2 should speak to the country-wide valuation effect of the funds that are internally cumulated within firms. A parsimonious way of capturing both effects is to use a firm's free cashflow (FCF), which is defined as:

$$FCF_i = CF_i - Investmnet_i \ . \tag{4}$$

As such, it is a measure of internal funds *and* an inverse measure of external funds at the same time. Consequently, we can estimate the following cross-sectional equation:

$$V_i = \alpha + \beta \ FCF_i + \varepsilon, \tag{5}$$

or equivalently,

$$\bar{V} = \alpha + \beta \ \overline{FCF}. \tag{6}$$

We call the β in Eq.'s (5) and (6) the FCF beta. A country's positive (negative) FCF beta means that, on average in the country, firm value increases in the cross-section with internal (external) funds. That is, a country's negative FCF beta means that, in the country, capital is efficiently

flowing to where it is most wanted and such capital allocation is the main driver of the country-wide corporate valuation. On the other hand, a country's positive FCF beta means that the internal cumulation of funds is playing the major role in the country's overall valuation of corporate equities.

Our research question is, in the cross-section of *countries*, how V_c and β are related. If they are negatively related, or equivalently, countries are valued higher when they have a more negative FCF beta, then it follows that firm values are higher in countries where capital allocation is more important than capital cumulation. If V_c and β are positively related, then the implication should be the opposite. Note that, in this setup, capital allocation is synonymous with corporate growth opportunities being externally funded across firms. Capital cumulation, on the other hand, is analogous to corporate profits being earned and internally kept within a firm.

3. Sample and data

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 1992 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.[4]

Each year, we define growth (mature) firms as those whose total assets are below (above) the sample median value within the country.[5] We require an industry—across all sample countries—to have at least one growth and one mature company each year, a requirement that is automatically satisfied for countries. Countries and industries are required to have valid data in all sample years. As a result, we have 43 countries and 41 industries that provide 573,406 firm-year observations.[6] As many as 55,228 firms enter our sample at least once and the average number of sample firms in a given year is 21,237.

Table 1 reports some information about our final sample. Panel A shows the list of 43 countries and 41 industries along with the average number of companies therein. Next to the average number of companies in each industry, we also report the fraction of growth firms (which are defined within country and thus whose fraction in a country is 50% by construction).

Approximately 19% of the sample firms are from the U.S., followed by Japan that accounts for nearly 12% of the sample. As such, the sample is uneven but correctly reflect the way that the global capital markets are composed of. In terms of industry, the most populated one is

[4] We obtained the industry information, on Feb 25, 2020, from: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_48_ind_port.html.

[5] A database covering a large number of countries, Datastream/Worldscope inevitably focuses on large firms in a given country. Thus, the growth firms in our sample—i.e., those below the sample median size in each country—could in fact be mature ones. However, this creates a bias *against* finding any differences between growth and mature firms in our sample.

[6] 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.

"Business Services", while the least inhabited one is "Shipbuilding" followed by "Aircraft." Some industries consist disproportionately of mature firms ("Utilities" and "Shipbuilding") and others have a greater presence of growth firms ("Medical equipment"). The minimum fraction of growth firms in an industry is 18% and the maximum is 72%.

Panel B of Table 1 reports summary statistics on total assets in log (ln(AT)), Tobin's q in log (ln(q)), cashflow (CF), and free cashflow (FCF). We compute Tobin's q ratio as the sum of the book value of total assets (AT) and the market value of common equity less the book value of common equity (CEQ), divided by the book value of total assets (AT). For the market value of common equity, we use the data item "MV" in Datastream/Worldscope for non-U.S. firms, and the product of the number of common shares outstanding (CSHO) and the year-end closing price (PRCC_F) for U.S. firms. We put the resulting q ratio in log to minimize the outlier problem. CF is the sum of the net income before extraordinary items and preferred dividends (IB) and the depreciation, depletion, and amortization (DP), divided by total assets (AT). FCF is computed by deducting the capital expenditure (CAPX) from the numerator of CF. If the capital expenditure is missing, then we treat it as zero. We winsorize all variables at the 1 and the 99 percentiles over the panel of firm-year observations for which we conduct estimation.

The summary statistics are computed over the firm-year observations of all firms, growth firms only, or mature firms only. Unsurprisingly, growth firms have a higher average and also a wider range of q ratio than mature firms. As might be expected, growth companies have negative CF and FCF, on average, whereas mature companies have positive ones. The difference between CF and FCF is the capital expenditure and it is certainly the lower bound of corporate investment because most of investment in intangible assets is expensed rather than capitalized and thus reduces CF in the first place (see, for example, Peters and Taylor (2017)).

4. Main empirical results

Our main empirical analysis is straightforward. On the one hand, we estimate the corporate valuations that are unique to a given country. On the other hand, we estimate the FCF beta within a given country. Finally, we cross-sectionally associate the country-specific corporate valuation with the country-specific FCF beta. We conduct this analysis using all sample firms, as well as separately for growth and mature companies.

4.1. Country-specific corporate valuation

To estimate the country-specific (i.e., neutral to global and industry effects) corporate valuations, we estimate the following equation:

$$\ln(q_{k,t}) = \alpha + \sum(\alpha^C \times C) + \sum(\alpha^I \times I) + \varepsilon_{k,t} \quad (7)$$

where $\ln(q_{k,t})$ is the natural log of firm k's q ratio in year t, C's are a set of 0/1 dummy variables for sample countries, and I's are a set of 0/1 dummy variables for sample industries. We restrict the sum of the country dummies' coefficient ($\Sigma\alpha^C$) and the sum of the industry dummies' coefficients ($\Sigma\alpha^I$) to be equal to zero, respectively, so that there is no multicollinearity problem in the presence of the intercept (see, e.g., Bae, Chan, and Ng (2004; p.250) for details). Our specification uses the global average as benchmark, which is captured by the intercept term (α), and the industry-specific effects are captured by α^I's. Consequently, α^C's measure each country's unique corporate valuations. We estimate Eq. (7) as a panel regression using the observations that are de-meaned by year-specific average values. By utilizing a larger number of observation

in the panel dataset, we can reduce the effects of outliers.[7]

Figure 1 reports the estimation results. The solid bars in Panel A are the country-specific valuations estimated over the full sample period of 1992-2018 using all sample firms. For comparison, we also plot—using blank bars—the country valuations without controlling for industry effects estimated by a variant of Eq. (7) in which $\Sigma(\alpha^{I}\times I)$ term is absent.

Three points are worth mentioning in Figure 1. First, the noticeable difference between the solid and blank bars indicates that part of a country's corporate valuations compared to other countries is due to different industry mixes across countries. For example, the corporate valuation of the U.S. stands at 0.28 (blank bar), but once the industry effects are controlled, it drops to 0.19 (solid bar). It is thus important to focus on the valuation that is neutral to industry effects (i.e., solid bars). Second, the country-specific valuation estimates here are obtained from a regression whose dependent variable is the natural log of q. Thus, for example, the U.S. estimate of 0.19 means that the country's unique valuation (neutral to any industry effects) is $e^{0.19}$ times the global average, or equivalently, about 21% higher than the global average. Third, there is huge variation in country-specific corporate valuations across countries. The minimum is -0.33 (or 28% lower than the global average) for Colombia and the maximum is 0.46 (or 59% higher than the global average) for China. This cross-country difference is what we try to understand through the lens of FCF beta.

Before moving on to FCF beta, we report the country-specific valuations that are estimated separately for growth firms and mature ones. Panel B of Figure 1 shows the result in which the country-specific valuations for growth firms are in the x-axis and those for mature firms in the y-axis. It is evident—and somewhat expected—that the valuations estimated only with growth

[7] In Section 5.1, we estimate the equation for sub-periods to detect time-series patterns.

firms (in the x-axis) are more widely disperse across countries than those with mature ones (in the y-axis). The former ranges approximately from -0.6 to 0.6, while the latter is between -0.3 and 0.3. As a result, the fitted line has a less-than-one slope. What is surprising in the figure is that the scatter plot does not tightly align on the fitted line, meaning that a country whose growth-firm valuation is higher than another country has a mature-firms valuation that is lower than another country. As they are not the two sides of the same coin, we continue our analysis for all firms, as well as for growth and mature firms separately.

4.2. Country-specific FCF beta

Before estimating the country-specific FCF beta, we explain our method with the following equation:

$$\ln(q_{k,t}) = \alpha + \beta \times FCF_{k,t} + \varepsilon_{k,t} \quad (8)$$

where $FCF_{k,t}$ is firm k's free cashflow in year t. As such, this approach ignores any country and industry effects, neither in the valuation level nor in its relation to FCF. Still, the equation helps understand the logic behind the FCF beta. We first point out that q, cashflow, and investment—the latter two of which are combined as FCF—are contemporaneous. Thus, our setup is different from the q theory in which the lagged q predicts the current-period investment.[8] Also, unlike the q theory, our question is how the cashflow after investment—i.e., FCF—is related to firm value. We estimate it each year across all firms, only for growth firms, or only for mature firms.

Figure 2, Panel A, shows that the FCF beta for growth companies is negative while the FCF

[8] See, for example, McLean, Zhang, and Zhao (2012) for an international study using the q theory.

beta for mature companies is positive. The former ranges from -0.921 to -0.304, meaning that each and every year, the relation between growth firms' valuations and their FCF is negative. In contrast, the q-FCF relation among mature companies is universally positive between 0.354 and 1.658. When we estimate the FCF beta across all sample firms, the resulting beta estimate is quite similar to the one with growth companies. This implies that the valuation effect of growth opportunities dominates that of profits, on average.

Now, by combining Eq.'s (7) and (8), we can obtain an equation for country-specific FCF betas. Specifically, we allow for country and industry effects both in the valuation level and in its relation to FCF. The former is implemented by including country and industry dummy variables in the equation (as in Eq. (7)), and the latter by interacting the two sets of dummy variables with FCF. Specifically, we estimate the following:

$$\begin{aligned}\ln(q_{k,t}) &= \alpha + \beta \times FCF_{k,t} \\ &+\sum(\alpha^C \times C) + \sum(\alpha^I \times I) \\ &+\sum(\beta^C \times FCF_k \times C) + \sum(\beta^I \times FCF_k \times I) \\ &+\varepsilon_{k,t}\end{aligned} \tag{9}$$

where 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 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). The coefficient on FCF itself, β, is the common or baseline FCF beta, and the coefficients on its interaction term with the country dummy variables, β^C's, are the additional FCF beta relevant only to each country. We use the sum of β and β^C to clearly see whether a country's FCF beta is positive or negative.

Panel B of Figure 2 shows the country-specific FCF beta for all firms, growth firms, and mature firms. While mature companies' FCF betas are mostly positive across countries, the FCF beta of growth companies fluctuates around zero across countries: some countries have a negative FCF beta but others have a positive one. The highest (most positive) FCF beta is found in Colombia, while the lowest (most negative) FCF beta is from Canada. As in Panel A, the beta estimate using all firms is closer to the growth-firm-only estimate than to the mature-firm-only case.

4.3. Relation between country-specific corporate valuation and FCF beta

We now associate the two, country-specific corporate valuations and country-specific FCF betas, in the cross-section of countries. We first create scatter plots for all firms, growth firms, and mature firms, and then estimate regressions. As we deal with a single cross-section of 43 sample countries, the standard errors of the regressions are based on the heteroscedasticity-consistent White (1980) covariance.

Figure 3, Panel A, shows that the relation between the country-specific corporate valuation and the FCF beta is negative—i.e., the more negative the FCF beta, the higher the valuation. Note that we use all sample firms for beta estimation here. Thus, a negative FCF beta means that the valuation effect of growth opportunities (i.e., high valuation associated with lower FCF, among growth firms) outweighs that of profits (i.e., high valuation associated with high FCF, among mature firms). The observed inverse relation between the country-specific corporate valuation and the FCF beta, therefore, indicates that the countries in which growth opportunities are more important than profits in firm value are valued higher than other countries in which profits play a larger role than growth opportunities in corporate valuation. The R-squared of the fitted line

is 13.1%, but China weakens the fitness of the linear relationship dramatically. While the Chinese corporate valuations are by far the highest, its FCF beta is positive in the middle of the spectrum. Without China, the R-squared rises to 25.2%.

Table 2, the section named "all firms", corroborates the results above with statistical significance. Specifically, model (1) shows that the negative slope of the fitted line has a p-value of 0.025. Even when the natural log of GDP per capita in 2010 U.S. dollars is controlled (model (2)), the coefficient on FCF beta and its p-value remain unchanged, and GDP per capita itself is insignificant. While one may wonder whether the high-valuation countries are simply rich (i.e., high GDP per capita) and corporate growth opportunities are better recognized there (i.e., FCF beta is negative), our results clearly indicate that the information in the FCF beta goes beyond national wealth. Without China, both models yield stronger evidence of the inverse relation between FCF beta and valuation, as the p-value for FCF beta is 0.003 without GDP control and 0.020 with it.

If a negative country-specific FCF beta is indeed a sign of growth opportunities being appreciated more than profits in valuation, then it should be even more negative when it is estimated only with growth firms. Further, if countries with a more negative FCF beta are valued higher *because* corporate growth opportunities are more important than profits in firm value, then this inverse relation between country-specific corporate valuation and the FCF beta should be more pronounced when the two are estimated only with growth firms. Panel B of Figure 3 confirms this prediction. The R-squared of the fitted line is now 21.7% with all 43 countries, and it increases to 40.6% without China.

What if we only use mature firms to which the role of growth opportunities is relatively limited and instead profits play a larger role in valuation? Panel C shows that the mature-firms-

only sample has a fitted line that is only weakly positively sloped with an R-squared of meager 2.8%, meaning that corporate profits are not the main reason for the cross-country difference in firm value.

Again, Table 2 provides the statistical support to the visual evidence in Panels B and C. Only with growth firms, the regression coefficient is -0.177 with a p-value of 0.004 without GDP control, and -0.173 with a p-value of 0.001 with it. Excluding China from the regressions, the coefficient is even more negative at -0.208 or -0.180 and the p-value is reduced further to 0.0001 or 0.001, depending on the GDP control. In contrast, only with mature firms to estimate country-specific firm value and country-specific FCF beta, the regression of the former on the latter has a coefficient that is insignificant and positive. Neither controlling for GDP nor excluding China from the regressions make any change to the regression coefficient on the FCF beta or the R-squared.

5. Robustness

We now substantiate our main results in the previous section with four robustness checks. First, we examine any time-series pattern in our results. Second, we employ alternative definitions of growth and mature companies, which we design to yield a weaker or a stronger result to the extent that our proxy for corporate life cycle is informative. Third, we offer firm-level evidence. Fourth, we conduct an industry analysis.

5.1. Time-series pattern

Our sample period, spanning from 1992 to 2018, is long enough to mask any secular or cyclical patterns. It is thus important to examine subperiods to detect time-series patterns. The time-

period of 1992-2018 also includes key events in global financial markets. Thus, it is instructive to examine the subperiods surrounding those events.

We split the sample period into four sub-periods, namely, 1992-1999, 2000-2007, 2008-2009, and 2010-2018. The idea is that we examine the 1990s separately, and also isolate the global financial crisis during the 2008-9. While a year-by-year analysis is conceivable, we choose to use those multi-year subperiods to continue with the panel estimation of country-specific corporate valuations and country-specific FCF beta, which helps minimize estimation errors.

Table 3 reports the results. The table is an expanded version of Table 2, model (1), in that each of the "all firms", "growth firms only", and "mature firms only" sections now has four subperiods instead of one full period. To save space, we do not report the results of model (2), which do not change any of our discussions below. Those results are available upon request.

As many as four observations are worth reporting. First, there is no reliable—neither positive nor negative—relation between country-specific corporate valuation and country-specific FCF beta in the 1990s. Second, during the period of 2000-2007, the results are qualitatively identical to the full-period results. Third, during the crisis period of 2008-9, the negative relation between country-specific corporate valuation and country-specific FCF beta is missing in the all-firms and the growth-firms-only samples. In sharp contrast, their positive relation among mature companies (which is insignificant for the full sample period) becomes highly significant during the crisis period. Fourth, after the crisis, the relations between country-specific firm value and country-specific FCF beta in the all-firms and the growth-firms-only samples return to a significantly negative one, and their relation in the mature-firms-only sample remains significantly positive.

Regarding the 1990s, we note that the coverage of the Datastream/Worldscope database is

quite limited. During that time-period, 22 of the 43 sample countries have the coverage that is less than 50% of the later period in terms of the number of companies. We therefore do not put too much emphasis on the result from this decade. The impact of the global financial crisis on our results is quite sensible, because the valuation focus in a tumultuous time is likely to be on corporate survival rather than growth. In that time-period, therefore, the FCF beta is expected to be positive and the negative relation between country-specific corporate valuations and country-specific FCF beta is likely to be weak or absent. Finally, during the two subperiods surrounding the crisis (2000-2007 and 2010-2018), the results are qualitatively identical to those for the full sample period. It is thus correct to say that our results stem mostly from the time-period starting in 2000.

5.2. Alternative definition of growth and mature firms

Thus far, growth (mature) companies are defined as those whose total assets are below (above) the median level of a country in a given year. We now change those definitions to ensure the robustness of our results. Specifically, we change the cutoff level for growth companies from 50% to 33%, 20%, or 10% from the bottom. Similarly, the cutoff for mature companies changes from 50% to 33%, 20%, or 10% from the top. This approach costs us the companies in the middle tercile, quintiles, and deciles. Still, the benefit of using those more extreme size subgroups is that we can see how the results change as we define growth and mature companies more narrowly. Our idea is that the more extreme a size subgroup is, the better it fits the profile of growth (mature) companies; consequently, the results should be sharper—provided that firm size is a correct proxy for the life cycle stage of a company.

Table 4 reports the results. As in Table 3, we only report the results of model (1) for brevity

but all our discussions below are robust to controlling for GDP per capita.[9] It is unmistakable that the negative relation between country-specific corporate valuation and country-specific FCF beta is more pronounced with more narrowly defined growth companies. From the bottom 50% to the bottom 10%, the coefficient changes monotonically from -0.177 to -0.593. The R-squared also increases, again monotonically, from 21.7% to 34.2%. Note that this analysis includes China, which dramatically reduces the fitness of this negative linear relation. Without it, the R-squared reaches 44.3% with the decile-based growth companies (results not tabulated).

What about mature companies? With more stringent definition, the relation between country-specific corporate valuation and country-specific FCF beta becomes weaker. For example, once we define top size decile companies as mature ones, there is literally no relation whatsoever between the two (both of which are estimated only with those mature companies). Specifically, the coefficient is 0.002 with a p-value of 0.855 and the R-squared is 0.1%. In a nutshell, how important corporate profits are in firm value of a country has little—if any—to do with the overall valuation level of the country.

5.3. Firm-level evidence

Our data contains as many as 573,406 firm-year observations, but our main analysis is conducted over a cross-section of 43 countries. It is desirable to utilize our firm-level data in a way that we obtain our evidence more directly from them. To that end, we sort countries into several groups by their unique valuation and estimate the FCF beta within the group. The question we are asking here is whether the FCF beta estimated within the high-valuation country group is more negative than the FCF beta of the low-valuation country group.

[9] The results of model (2) are available upon request.

Specifically, the sorting variable is the country-specific valuation estimated by Eq. (7) (i.e., a set of β^{C}'s), and within each of the sorted country groups, we pool the firm-year observations that are demeaned by the year- and country-specific averages. Finally, the FCF beta is estimated by Eq. (8). Below we focus on the beta estimated within the highest- and the lowest-valuation country groups (top and bottom terciles, quintiles, and deciles).

Table 5 shows the results. Indeed, the FCF beta estimated over the companies in high-valuation countries (i.e., "highest tercile", "highest quintile", and "highest decile" rows in the table) is significantly negative, especially when we use only growth companies for the estimation. The beta estimated in the low-valuation countries is either insignificant or positive, making a sharp contrast with the high-valuation countries. This is consistent with our earlier results in which an inverse relation exists between corporate valuation and FCF beta at the country level. However, no such distinction is present with mature companies, as the beta estimates are similarly positive between the highest- and the lowest-valuation groups comprising only mature firms.

To sum up, when we look at the countries whose corporate valuations are high in the cross-section of countries—either based on all firms or growth firms only, we see companies with lower free cashflow to be valued higher. Our interpretation of this observation is that the investment and growth, which cause free cashflow to be lower and firm value to be higher, are the reason for the cross-country difference in corporate valuations.

5.4. Industry analysis as falsification test

One would think that companies in an industry share a common business outlook. While that may well be true, it remains an open question whether such industry-wide growth opportunities

are *priced* similarly regardless of where the companies are located. Above, we already find a sizable difference in FCF beta across countries, meaning that some countries are better at capitalizing growth opportunities into firm value than others. To complete the analysis, we now replace country with industry in which the country-specific factors are washed away. This approach effectively takes out country from the analysis and allows us to see how the result changes. If the result is truly due to country-specific factors, then we would not see the same pattern once country is taken out of the analysis. To this end, we estimate industry-specific corporate valuations (i.e., α^I from Eq. (7)) and industry-specific FCF beta (i.e., sum of β and β^I from Eq. (9)). We then associate the two cross-sectionally to see whether their relation is also negative.

Table 6 shows that the negative relation disappears once we switch to industry from country. In all three cases ("all firms", "growth firms only", and "mature firms only"), the predominant relation between the industry-specific firm value and industry-specific FCF beta is positive. That is, an industry as a whole has a higher valuation when the companies therein with more FCF are valued higher. It thus follows that corporate profits play a larger role in valuation than growth opportunities. The results also mean that the valuation effect of growth opportunities is country-specific and, hence, it is washed away within an industry that contains multiple countries.

As an aside, we note that, among mature companies, a positive relation between firm value and FCF beta at the industry level begins to take hold during the financial crisis of 2008-9. During the two-year crisis period, the regression coefficient is 0.041 with a p-value of 0.097 and the R-squared is 5.5%. Subsequently, the coefficient rises to 0.091 with a p-value of virtually zero and the R-squared is 28.9%. It implies that the financial crisis reinforces investors' focus on corporate profitability. With mature companies who can generate stable cashflows, high-valuation

industries are thus those in which profitable firms are valued higher.

6. FCF beta and country-level governance

The contribution of growth opportunities and profits to firm value depends critically on good governance. Without a well-functioning governance system, high FCF in a mature company may be a source of agency problems. Similarly, without a close monitoring system in place, growth companies would not be able to raise funds for their investments and their low FCF would a sign of a struggle rather than that of investment and growth. In words, the hypothesized meaning of FCF beta—i.e., a measure of relative importance between growth opportunities and profits in firm value—is contingent on good governance.

To further investigate this implication, we compare the FCF beta between common law countries and civil law countries. The law and finance literature has established that common law is better at protecting outside investors and assuring them of a fair return on their investment than civil law (La Porta et al. 1997, 1998, 2002; Johnson et al. 2000; Djankov et al. 2008). However, it is not straightforward to predict how the two legal origins compare in our FCF analysis. It is because common law countries may be good at both fostering investments in growth firms and securing payouts from mature companies. That is, the force behind a negative FCF beta may well compete with the force behind a positive FCF beta. While we could obtain a FCF beta as a net effect of the two forces, the FCF beta could end up being indeterminate.

To mitigate this inference issue, we again distinguish growth firms from mature ones and estimate their FCF betas separately. As mentioned earlier, the role of profits in the valuation of growth firms is likely to be limited and, by the same token, growth opportunities would not play a major role in the valuation of mature firms. In this separate analysis in which growth

opportunities and profits do not compete, we can better observe the difference in FCF beta between common law and civil law countries.

Table 7 shows that the FCF beta is more negative in common law countries than in civil law countries. When we separate growth firms and mature ones, we find an even larger difference in FCF beta in the growth-firms-only sample as the FCF beta is more significantly lower in common law countries than in civil law country. Interestingly, however, there is little difference in FCF beta between the two country groups when we use only mature companies. All those patterns remain robust—or become even stronger—when we compare common law countries only with French civil law countries.

The results with the legal origins are instructive. If the common law is good at preventing corporate resources from being diverted by corporate insiders, investors of mature companies will expect to receive a fair share of the profits as a payout, leading to a higher valuation. Investors of growth companies will not expect to receive any payout for some time, but they will be assured that the funds they provide to the company are not misused. Therefore, they will remain prepared to support the company's growth, which leads to a higher valuation. Between the two—i.e., securing payouts and fostering growth, our FCF beta results indicate that the common law countries are particularly good at supporting corporate growth.

In an unreported result, we also examined other country-level governance measures: namely, the anti-director rights index of La Porta et al. (1998), the revised anti-self-dealting index of Djankov et al. (2008), and two measures by Spamann (2010) who corrects the errors in ***LLSV98*** based on the 1997 and the 2005 data. We found that the Spearman correlation between FCF beta and the four country-level governance measures is low and none of them are statistically significant. Even the signs of the correlation coefficients are not consistent—positive in some

cases and negative in others. This finding suggests that the FCF beta contains different information from those existing governance measures. The results are available upon request.

7. Conclusions

Companies in some countries are valued higher than those in other countries, even after controlling for the cross-country differences in industry composition and national wealth. Is this corporate profits or corporate growth opportunities that are priced differently across countries and create such a cross-country difference? The stakes of this inquiry are high given the soaring interests in corporate social responsibility and the high demand for an explanation for the extent to which shareholder value translates into social value. As convincingly explained by Morck (2014), the two values are equivalent only when stock prices reflect corporate growth opportunities rather than profits and economic rents.[10] Only with that equivalency, stock prices would be qualified as a measure of a country's economic growth and progress.

Our main finding, from the data of 43 countries for the period of 1992-2018, is that high-valuation countries are those in which growth opportunities play a larger role in corporate valuations than profits. This result is sharper (absent) when we only use growth (mature) firms for the analysis, further confirming the role of growth opportunities. Overall, our results support that stock prices—especially those of small-sized, growth-focused companies—reflect the allocation of capital in a country and can serve as an acceptable measure of the country's economic progress. In contrast, the stock prices of big, mature firms are driven primarily by their profits and are more representative of the industry they belong to than their country.

[10] For an in-depth discussion of corporate social responsibilities, see Edmans (2020).

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Table 1. Sample characteristics

This table reports the distribution of sample firms across countries and industries (Panel A) and the summary statistics of key variables (Panel B). 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 1992 to 2018. (Using FIC='USA', we identify and keep only American companies in Compustat.) 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. Each year we define growth (mature) firms as those whose total assets are below (above) the sample median value within the country. We require an industry—across all sample countries—to have at least one growth and one mature company each year. Countries and industries are required to have valid data in all sample years. As a result, we have 43 countries and 41 industries that provide 573,406 firm-year observations. As many as 55,228 firms enter our sample at least once and the average number of sample firms in a given year is 21,237.

Panel A shows the list of 43 countries and 41 industries along with the average number of companies therein. Next to the average number of companies in each industry, we also report the fraction of growth firms (which are defined within country and thus whose fraction is 50% in each country by construction).

Panel B reports summary statistics on total assets in log (ln(AT)), Tobin's q in log (ln(q)), cashflow (CF), and free cashflow (FCF). We compute Tobin's q ratio as the sum of the book value of total assets (AT) and the market value of common equity less the book value of common equity (CEQ), divided by the book value of total assets (AT). For the market value of common equity, we use the data item "MV", which is provided by Datastream/Worldscope for non-U.S. firms, and the product of the number of common shares outstanding (CSHO) and the year-end closing price (PRCC_F) for U.S. firms. We put the resulting q ratio in log to minimize the outlier problem. CF is the sum of the net income before Extraordinary Items and Preferred Dividends (IB) and the depreciation, depletion, and amortization (DP), divided by total assets (AT). FCF is computed by deducting the capital expenditure (CAPX) from the numerator of CF. If the capital expenditure is missing, then we treat it as zero. We winsorize all variables at the 1 and the 99 percentiles over the panel of firm-year observations for which we conduct estimation.

Table 1. cont.

Panel A. Distribution of sample firms across countries and industries

country	# sample firms	industry	# sample firms	% growth firms
ARGENTINA	53	AGRICULTURE	249	45%
AUSTRALIA	953	FOOD PRODUCTS	597	44%
AUSTRIA	59	CANDY & SODA	108	42%
BELGIUM	87	BEER & LIQUOR	152	40%
BRAZIL	89	RECREATION	194	57%
CANADA	1274	ENTERTAINMENT	321	56%
CHILE	120	PRINTING AND PUBLISHING	195	48%
CHINA	1552	CONSUMER GOODS	427	52%
COLOMBIA	26	APPAREL	272	53%
DENMARK	116	HEALTHCARE	208	56%
FINLAND	111	MEDICAL EQUIPMENT	369	72%
FRANCE	509	PHARMACEUTICAL PRODUCTS	826	65%
GERMANY	557	CHEMICALS	805	45%
GREECE	116	RUBBER AND PLASTIC PRODUCTS	225	55%
HONG KONG	631	TEXTILES	370	56%
INDIA	1114	CONSTRUCTION MATERIALS	801	47%
INDONESIA	237	CONSTRUCTION	1058	32%
IRELAND	50	STEEL WORKS ETC	607	37%
ISRAEL	191	FABRICATED PRODUCTS	118	55%
ITALY	176	MACHINERY	930	53%
JAPAN	2605	ELECTRICAL EQUIPMENT	397	57%
KOREA	1033	AUTOMOBILES AND TRUCKS	529	36%
LUXEMBOURG	19	AIRCRAFT	66	30%
MALAYSIA	612	SHIPBUILDING, RAILROAD EQUIPMENT	54	26%
MEXICO	87	PRECIOUS METALS	640	70%
NETHERLANDS	122	NON-MET AND IND METAL MINING	519	60%
NEW ZEALAND	83	COAL	122	43%
NORWAY	130	PETROLEUM AND NATURAL GAS	755	39%
PAKISTAN	127	UTILITIES	525	18%
PERU	66	COMMUNICATION	445	30%
PHILIPPINES	113	PERSONAL SERVICES	208	57%
POLAND	192	BUSINESS SERVICES	2370	66%
PORTUGAL	44	COMPUTERS	659	63%
SINGAPORE	378	ELECTRONIC EQUIPMENT	1209	56%
SOUTH AFRICA	219	MEASURING AND CONTROL EQUIP	275	67%
SPAIN	112	BUSINESS SUPPLIES	317	43%
SWEDEN	288	SHIPPING CONTAINERS	91	41%
SWITZERLAND	165	TRANSPORTATION	682	31%
TAIWAN	1016	WHOLESALE	1091	50%
THAILAND	349	RETAIL	1001	38%
TURKEY	165	RESTAURANTS, HOTELS, MOTELS	449	50%
UK	1164			
USA	4126			

Table 1. cont.

Panel B. Summary statistics

	var	n	mean	std	min	p1	p25	p50	p75	p99	max
all firms	ln(AT)	573406	5.0	2.1	-0.5	0.2	3.6	4.9	6.3	10.0	10.6
	ln(q)	573406	0.3	0.6	-1.2	-0.8	-0.1	0.2	0.7	2.3	3.2
	CF	573406	1%	24%	-192%	-120%	1%	6%	11%	31%	36%
	FCF	573406	-5%	25%	-202%	-131%	-5%	2%	6%	26%	31%
growth firms only	ln(AT)	286649	3.5	1.4	-1.1	-0.5	2.7	3.7	4.5	6.2	7.3
	ln(q)	286649	0.4	0.7	-1.4	-0.9	-0.1	0.3	0.8	2.7	3.5
	CF	286649	-5%	36%	-280%	-184%	-6%	5%	10%	33%	39%
	FCF	286649	-11%	37%	-297%	-198%	-12%	0%	6%	29%	34%
mature firms only	ln(AT)	286757	6.5	1.6	2.9	3.3	5.4	6.3	7.4	10.6	11.2
	ln(q)	286757	0.3	0.5	-1.1	-0.7	-0.1	0.2	0.5	1.8	2.7
	CF	286757	7%	9%	-57%	-29%	3%	7%	11%	29%	34%
	FCF	286757	1%	11%	-66%	-43%	-2%	2%	6%	23%	28%

Table 2. Cross-sectional regressions

This table reports the cross-sectional regressions of country-specific corporate valuations on country-specific FCF beta (and the natural log of GDP per capita in 2010 U.S. dollars). The former is estimated by Eq. (7) (i.e., α^{C}'s) and the latter by Eq. (9) (i.e., $\beta + \beta^{C}$'s), over the period of 1992-2018 with the observations winsorized at the 1 and the 99 percentiles. The GDP data are the average over the same period. 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 below are based on White (1980) covariance.

	model	FCF beta	ln(GDP pc)	R^2	# obs	
		coeff (p-val)	coeff (p-val)			
all firms	(1)	-0.084 (0.025)		13.1%	43	
	(2)	-0.089 (0.031)	-0.004 (0.831)	13.2%	43	
	(1)	-0.098 (0.003)		25.2%	42	(without
	(2)	-0.085 (0.020)	0.012 (0.368)	26.2%	42	China)
growth firms only	(1)	-0.177 (0.004)		21.7%	43	
	(2)	-0.173 (0.003)	0.003 (0.890)	21.7%	43	
	(1)	-0.208 (0.0001)		40.6%	42	(without
	(2)	-0.180 (0.001)	0.025 (0.106)	42.9%	42	China)
mature firms only	(1)	0.030 (0.262)		2.8%	43	
	(2)	0.030 (0.247)	0.002 (0.891)	2.9%	43	
	(1)	0.030 (0.244)		3.5%	42	(without
	(2)	0.033 (0.177)	0.010 (0.357)	5.1%	42	China)

Table 3. Cross-sectional regressions by subperiods

This table reports the subperiod cross-sectional regressions of country-specific corporate valuations on country-specific FCF beta. The former is estimated by Eq. (7) (i.e., $\alpha^{C\prime}$s) and the latter by Eq. (9) (i.e., $\beta + \beta^{C\prime}$s), over each of the four subperiods with the observations winsorized at the 1 and the 99 percentiles for each subperiod. The p-values below are based on White (1980) covariance.

	sub-period	coeff on FCF beta	(p-val)	R^2	# obs
all firms	1992-1999	0.054	(0.258)	2.4%	43
		0.040	(0.398)	1.4%	42 (without China)
	2000-2007	-0.084	(0.076)	8.8%	43
		-0.103	(0.020)	15.7%	42 (without China)
	2008-2009	0.039	(0.076)	3.4%	43
		0.034	(0.119)	4.3%	42 (without China)
	2010-2018	-0.056	(0.077)	7.0%	43
		-0.063	(0.040)	11.1%	42 (without China)
growth firms only	1992-1999	0.063	(0.247)	2.9%	43
		0.040	(0.470)	1.2%	42 (without China)
	2000-2007	-0.171	(0.005)	21.1%	43
		-0.199	(0.000)	33.5%	42 (without China)
	2008-2009	-0.016	(0.463)	0.5%	43
		-0.009	(0.678)	0.2%	42 (without China)
	2010-2018	-0.126	(0.017)	14.5%	43
		-0.142	(0.004)	23.9%	42 (without China)
mature firms only	1992-1999	0.020	(0.587)	1.2%	43
		0.019	(0.599)	1.1%	42 (without China)
	2000-2007	0.017	(0.602)	0.5%	43
		0.016	(0.622)	0.5%	42 (without China)
	2008-2009	0.093	<.0001	22.7%	43
		0.089	<.0001	25.7%	42 (without China)
	2010-2018	0.059	(0.008)	14.5%	43
		0.063	(0.004)	17.6%	42 (without China)

Table 4. Cross-sectional regressions with alternative definitions of growth and mature firms
This table reports the cross-sectional regressions of country-specific corporate valuations on country-specific FCF beta using alternative definitions of growth and mature firms. Specifically, growth firms are defined as those whose total assets are in the bottom 10%, 20%, 33%, or 50% within a country in a year. Similarly, mature firms are defined as those whose total assets are in the top 10%, 20%, 33%, or 50% within a country in a year. Other specifications are the same as Table 2.

definition of growth & mature firms	coeff on FCF beta	(p-val)	R^2	# obs	coeff on FCF beta	(p-val)	R^2	# obs
	growth firms only				mature firms only			
top & bottom 10%	-0.593	(<.0001)	34.2%	43	0.002	(0.855)	0.1%	43
top & bottom 20%	-0.392	(0.000)	33.0%	43	0.012	(0.491)	1.1%	43
top & bottom 33%	-0.252	(0.005)	22.6%	43	0.037	(0.079)	5.6%	43
top & bottom 50%	-0.177	(0.004)	21.7%	43	0.030	(0.262)	2.8%	43

Table 5. FCF beta estimation by low- and high-valuation country groups

This table reports the FCF betas estimated in each of the country groups formed by country-specific corporate valuations. Specifically, we estimate Eq. (7) over the period of 1992-2018 with the observations winsorized at the 1 and the 99 percentiles, and sort sample countries into terciles, quintiles, or deciles by their country-specific corporate valuations (i.e., α^{C}'s). Within each group, we estimate Eq. (8) to obtain the FCF beta (i.e., β) for the same period with the observations demeaned by the year- and country-specific averages. The p-values below are based on the clustering-consistent standard errors among same-firm observations.

subgroup by country-specific valuation	FCF beta	(p-val)	R^2	# obs	FCF beta	(p-val)	R^2	# obs	FCF beta	(p-val)	R^2	# obs
	all firms				growth firms only				mature firms only			
lowest tercile	0.05	(0.110)	0.0%	166504	0.00	(0.995)	0.0%	74589	1.45	(<.0001)	6.7%	95424
highest tercile	-0.49	(<.0001)	7.2%	278047	-0.48	(<.0001)	9.8%	152859	0.97	(<.0001)	4.9%	138425
lowest quintile	0.24	(<.0001)	0.3%	131807	-0.01	(0.855)	0.0%	61968	1.33	(<.0001)	5.2%	73680
highest quintile	-0.49	(<.0001)	7.7%	256218	-0.48	(<.0001)	10.9%	129260	1.24	(<.0001)	6.4%	102372
lowest decile	1.07	(<.0001)	4.4%	6830	0.00	(0.046)	0.0%	3395	1.30	(<.0001)	4.4%	58012
highest decile	-0.54	(<.0001)	6.1%	163307	-0.41	(<.0001)	8.1%	43149	1.02	(<.0001)	4.8%	81157

Table 6. Cross-sectional regressions – Industry analysis

This table reports the cross-sectional regressions of industry-specific corporate valuations on industry-specific FCF beta. The former is estimated by Eq. (7) (i.e., α^{I}'s) and the latter by Eq. (9) (i.e., $\beta + \beta^{I}$'s), over the period of 1992-2018, and four sub-periods, with the observations winsorized at the 1 and the 99 percentiles over the estimation period. The p-values below are based on White (1980) covariance.

	period	coeff on FCF beta	(p-val)	R^2	# obs
all firms	1992-2018	0.049	(0.494)	0.7%	41
	1992-1999	-0.068	(0.456)	1.2%	41
	2000-2007	0.086	(0.225)	2.7%	41
	2008-2009	0.050	(0.417)	1.3%	41
	2010-2018	0.087	(0.205)	2.5%	41
growth firms only	1992-2018	0.243	(0.017)	8.7%	41
	1992-1999	-0.037	(0.679)	0.3%	41
	2000-2007	0.152	(0.062)	6.3%	41
	2008-2009	0.126	(0.152)	6.0%	41
	2010-2018	0.215	(0.030)	9.1%	41
mature firms only	1992-2018	0.064	(0.028)	10.7%	41
	1992-1999	0.052	(0.142)	4.8%	41
	2000-2007	0.011	(0.723)	0.2%	41
	2008-2009	0.041	(0.097)	5.5%	41
	2010-2018	0.091	(0.000)	28.9%	41

Table 7. Difference in FCF beta between civil law and common law countries

This table compares the FCF beta, estimated by Eq. (9) (i.e., $\beta + \beta^{I}$'s) over the period of 1992-2018 with the observations winsorized at the 1 and the 99 percentiles over the estimation period, between civil law (or French civil law) countries and common law countries, along with the p-values for the difference in mean and median.

		Civil law countries (29)	French law countries (16)	Common law countries (14)	p-value for diff: Civil vs. Common	p-value for diff: French vs. Common
FCF beta	mean	0.439	0.630	0.027	(0.024)	(0.006)
(all firms)	median	0.343	0.505	-0.279	(0.020)	(0.011)
FCF beta	mean	0.181	0.350	-0.182	(0.027)	(0.007)
(growth firms only)	median	0.164	0.236	-0.467	(0.010)	(0.013)
FCF beta	mean	1.480	1.463	1.298	(0.338)	(0.424)
(mature firms only)	median	1.543	1.608	1.310	(0.404)	(0.424)

Figure 1. Country-specific corporate valuations: 1992-2018

This figure reports country-specific corporate valuations. In Panel A, the solid bars represent the country-specific corporate valuations estimated by Eq. (7) using all sample firms. The blank bars are those that are estimated by a variant of Eq. (7) in which $\Sigma(\alpha^{I} \times I)$ terms are absent. Panel B shows the country-specific corporate valuations estimated by Eq. (7) only using growth firms (x-axis) or mature firms (y-axis). The estimation period is 1992-2018.

Panel A. Estimates using all firms

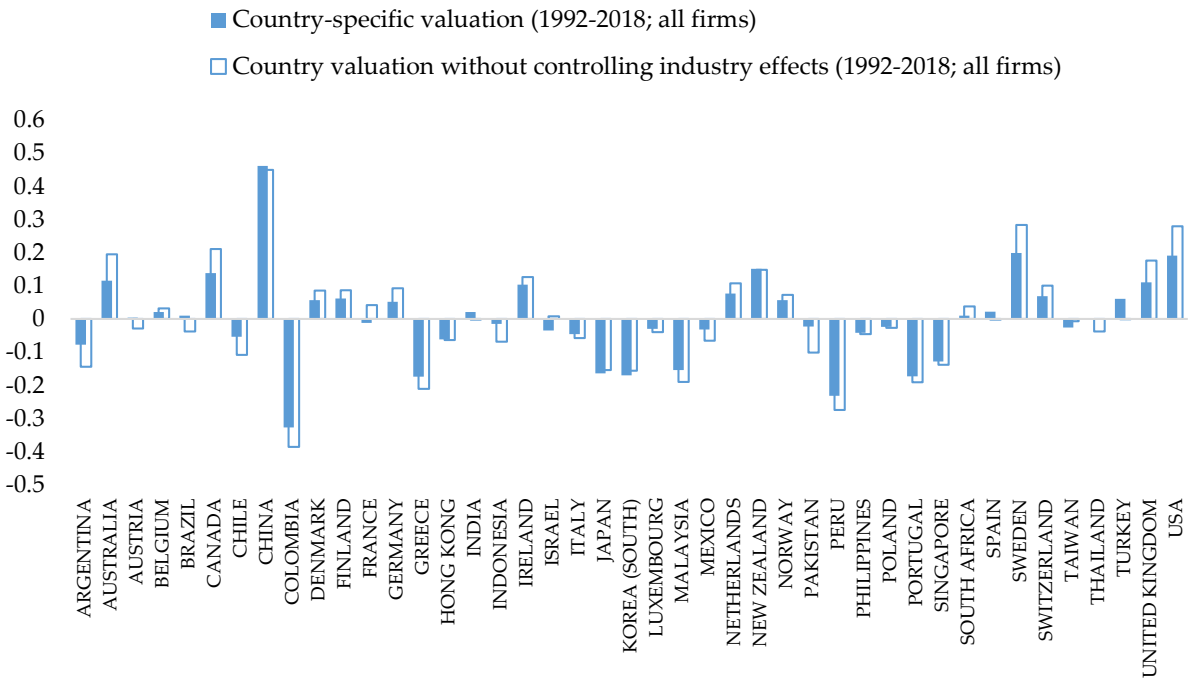


Figure 1. cont.

Panel B. Estimates using growth firms only vs. mature firms only

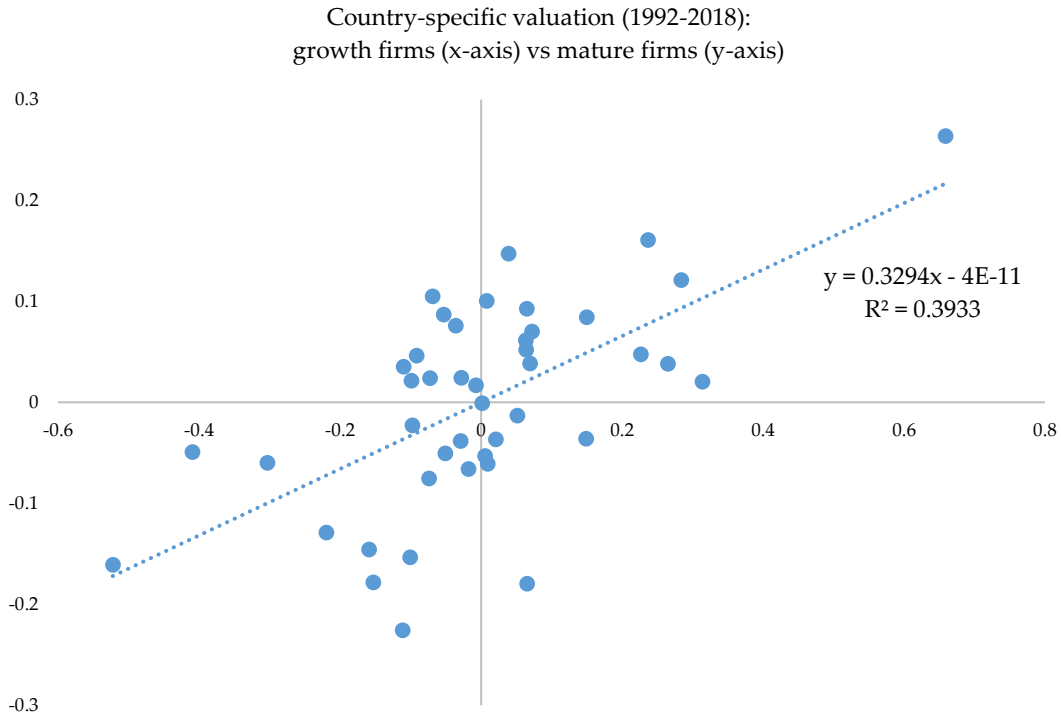


Figure 2. FCF beta: 1992-2018

This figure reports FCF betas. Panel A shows the FCF beta estimated by Eq. (8), while Panel B shows the FCF betas estimated by Eq. (9). In each panel, we report three betas: one estimated with all sample firms, one only with growth firms, and one only with mature firms. The estimation period is 1992-2018.

Panel A. Overall FCF beta

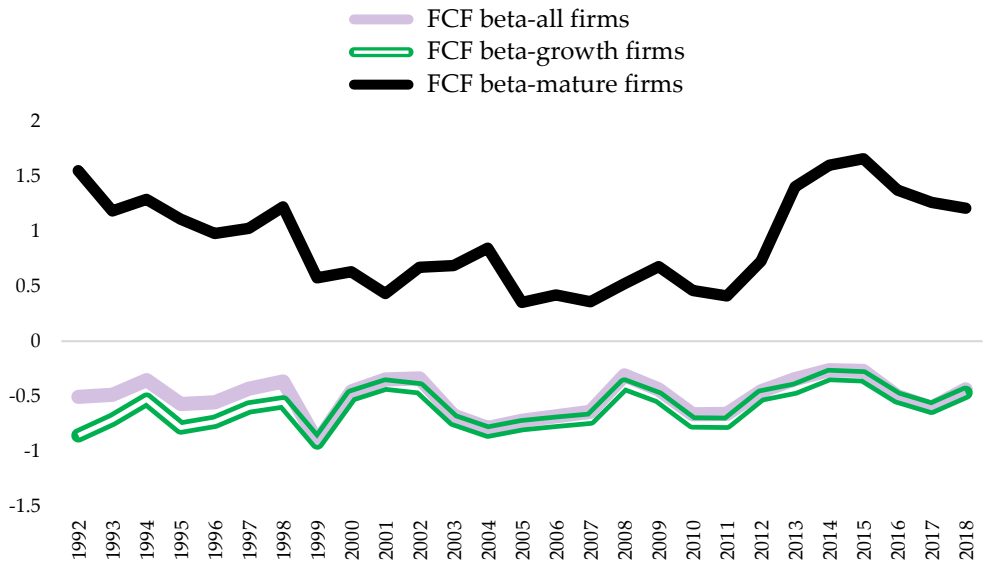


Figure 2. cont.

Panel B. Country-specific FCF beta

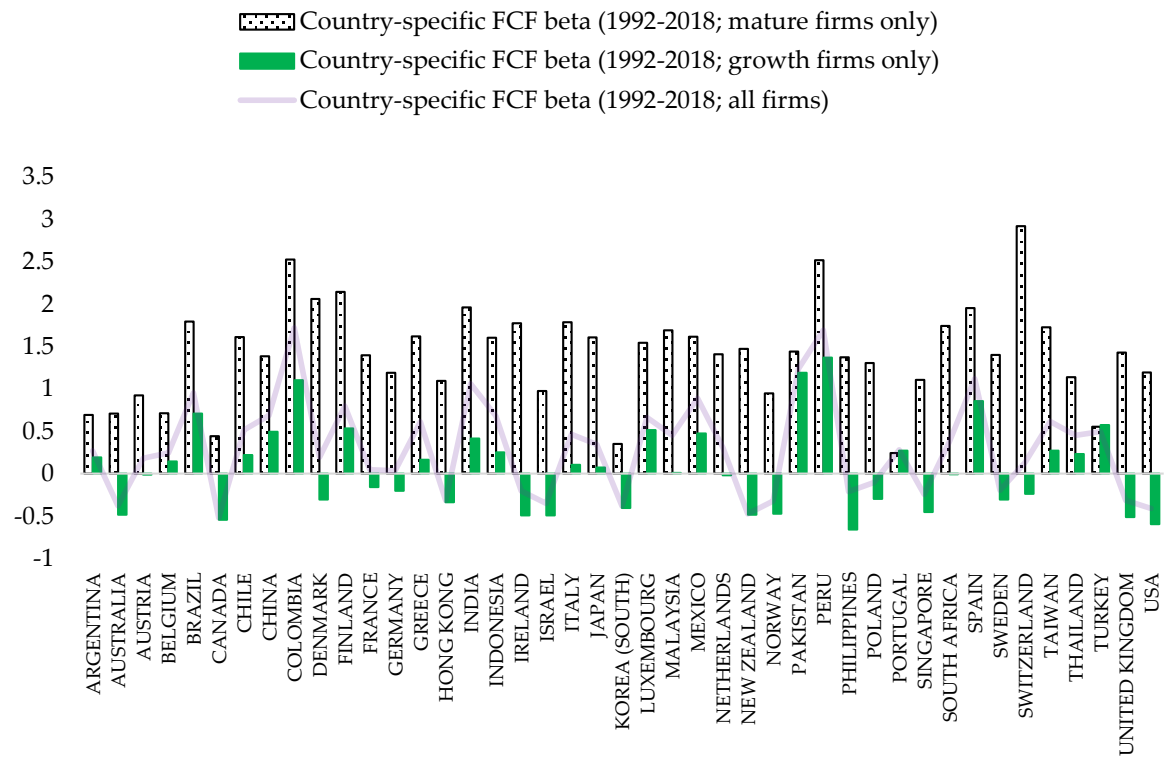


Figure 3. Relation between country-specific corporate valuations and country-specific FCF beta: 1992-2018

This figure reports scatter plots between country-specific corporate valuations and country-specific FCF betas. Panel A is the one in which both are estimated with all sample firms, while Panels B and C are the ones in which both are estimated only with growth and mature firms, respectively. The estimation period is 1992-2018.

Panel A. Using all firms

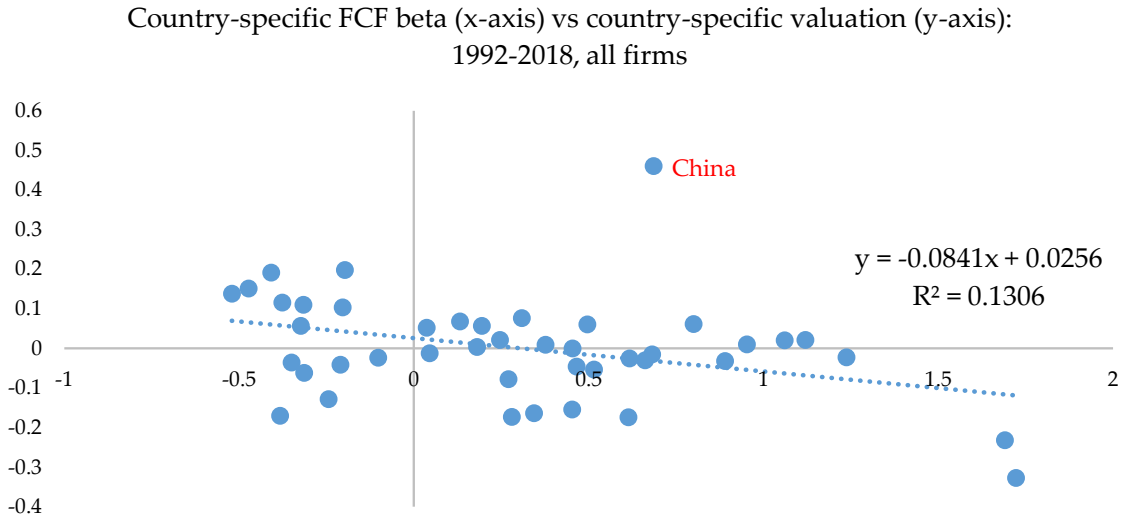
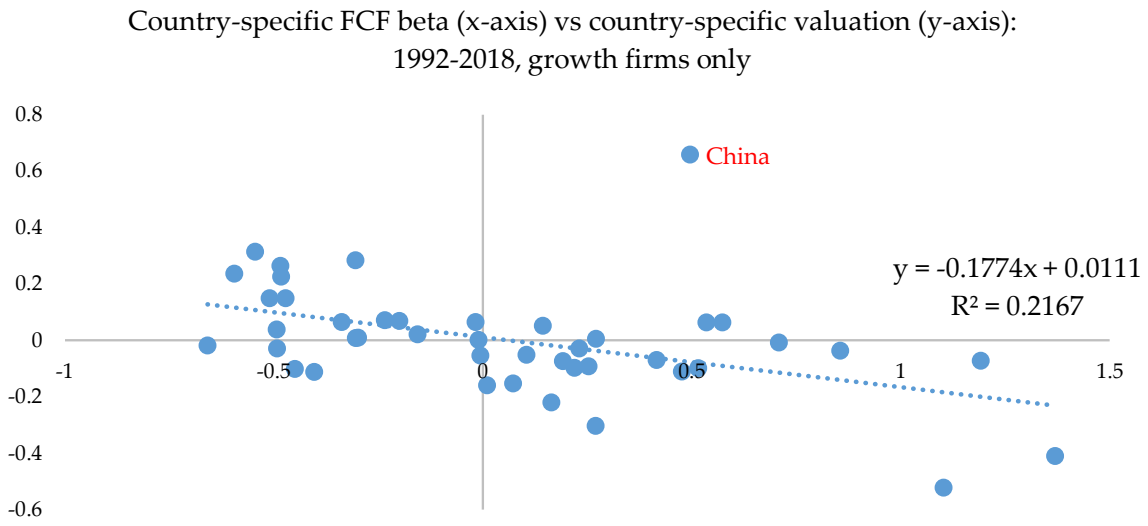


Figure 3. cont.

Panel B. Using growth firms only



Panel C. Using mature firms only