Indirect benefits of financial globalization: Evidence from small firms' growth opportunities

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Keywords: Financial globalization; Indirect benefits; Firm size; Growth opportunities
JEL classification: F30; F65; G30

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1. Introduction

Perhaps surprisingly, the benefits of financial globalization remain elusive (Eichengreen 2001; Stulz 2005; Gourinchas and Jeanne 2006; Kose, Prasad, Rogoff, and Wei 2009). While both academics and policymakers used to believe that there are huge gains from allowing capital to flow freely across countries, the empirical evidence for the alleged benefits—namely, efficient capital allocation and global risk sharing—is mixed. In response, recent studies turn their attention to indirect or "collateral" benefits, such as the development of domestic financial markets and institutions as well as more disciplined macroeconomic policies—see, again, the aforementioned references. However, those indirect benefits are difficult to document; by nature, their links to financial globalization are likely to be only circumstantial. In this paper, we take a novel approach to measuring the indirect benefits of financial globalization.

Our approach is to focus on corporate growth opportunities and the extent of their being country-specific, with particular attention to small-size companies. The rationale for this approach is as follows. While a country's institutions affect all economic agents in the country, corporations are arguably the one for which the type of institutional changes caused by cross-border capital flows is most relevant. Also, the effects of those institutional changes are likely to be broad-based and persistent over time and, hence, they will be reflected in the present value of growth options rather than the assets in place. Therefore, we posit that corporate growth opportunities are a good place to detect indirect benefits of financial globalization. Note, however, that financial globalization may not necessarily improve corporate growth opportunities, because under-developed local markets and institutions may give a privilege—rather than a constraint—to some companies. For example, some firms may be enjoying a preferential treatment via corrupt political connections or an easy access to capital thanks to poor governance. For those companies and their growth options, the improved domestic institutions brought by financial globalization may not be good news. One thing for sure, however, is that financial globalization—provided that it has *any* impact—will weaken the country-dependence of corporate growth opportunities and make them priced more by the global (i.e., country-neutral and industry-specific) standards.

In that context, small firms and their growth opportunities are particularly instructive. It is well known that firm size is a good proxy for the extent of a firm being affected by various

market frictions. Thus, changes in domestic institutions is likely to affect those small firms more than large companies, as shown by Beck, Demirguc-Kunt, and Maksimovic (2005). At the same time, those small firms are denied direct access to foreign capital and thus are forfeited direct benefits of financial globalization (e.g., Kang and Stulz 1997). Consequently, the growth opportunities of small-size companies are useful in isolating the indirect benefits of financial globalization. Based on these notions, we gauge the indirect impacts of financial globalization by measuring the country-specific growth opportunities (*CSGOs*)—especially those of small firms—and associating the *CSGOs* with financial openness. After establishing this channel, we examine whether the observed impacts are indeed beneficial.

We measure *CSGOs* by estimating a year-by-year cross-sectional regression of firm-level Tobin's q on a set of country and industry dummy variables, *à la* Heston and Rouwenhorst (1994). The coefficient on each of the country dummy variables, in absolute terms, then represents the country's average deviation from the global average q while the industry effects are taken into account. That is, the absolute value of the country dummy variable's coefficient quantifies the country-specific *and* industry-neutral components in corporate growth opportunities proxied by Tobin's q ratio. We estimate the *CSGOs* for the entire country, as well as for the country's small and large firms separately. The difference or "gap" in *CSGOs* between the two size-sorted groups is also included in the later analysis.

Using data for 53,365 firms from 40 countries over the period of 1991-2012, we first document the existence of sizable *CSGOs*. On average across the sample countries and over the sample period, the country-specific component causes corporate growth opportunities to be 16% higher or lower than they would otherwise be. Interestingly, however, we find no evidence of asymmetry in *CSGOs*, in that there is little difference between the upward and the downward deviations from the global average that are caused by the country-specific components.

When we separately examine small companies and larger ones (as defined by the median total assets in a given country, each year), *CSGOs* turn out to be much more pronounced in small companies than in large firms. More specifically, while the *CSGOs* of large firms account for approximately 13% of their growth opportunities, small companies have 22% of their growth options driven by country-specific components. In addition, there is strong evidence of asymmetry in small firms, as the country-specific component causes small firms' growth

options to be priced lower rather than higher. In other words, the country-specific component affecting small firms is a constraint rather than a privilege.

In order to see the relation of *CSGOs* to financial globalization, we regress them on a measure of a country's financial openness, along with a large set of control variables. In cross-section, a country's overall *CSGOs*—as well as those of small and large firms—are negatively related to the country's financial openness, which is measured by the sum of the country's foreign assets and liabilities, divided by its GDP.[1] This result means that companies in financially more open countries have fewer *CSGOs* than (similar-size) firms in relatively closed countries. However, the economic magnitude is much greater in the small-firm case and, as a result, greater financial openness is associated with a narrower gap in *CSGOs* between small and large companies. The negative relation between financial openness and the *CSGO*-gap, together with the greater reduction in small firms' *CSGOs*, indicates that small firms' growth options become less dependent on country and thus more comparable to those of large firms.

We also conduct a "within-country" analysis, in which we associate *changes* in financial openness with *changes* in the *CSGOs*. Similar to the results of the cross-sectional analysis, we find a negative relation between the two only when the *CSGOs* are estimated for the entire country or for the country's small firms. In other words, we find no relation between changes in financial openness and changes in large firms' *GSGOs*. Consequently, a significantly negative relation arises between changes in financial openness and changes in the *CSGO*-gap between small and large firms. The results mean that as a country becomes more open financially, small firms see their growth options depend less on country and thus catch up with their bigger-size country peers.

At least three issues need addressing. One is, of course, endogeneity and the second is whether Tobin's q-ratio is an appropriate proxy for corporate growth opportunities. Finally, we need to answer the question of whether the weaker *CSGOs* are actually beneficial to the company. Starting with the last, we examine whether the weaker *CSGOs* are simply indicative of more correlated growth options across countries *regardless of* their economic

[1] According to Kose, Prasad, Rogoff, and Wei (2009; p.15), this measure best captures a country's financial openness. If one is willing to define financial globalization as the "liberalization of trade in financial assets", as in Stulz (2005; p.1595), then a country's foreign assets and foreign liabilities *combined* are a direct measure of the country's financial openness.

fundamentals. To answer this question, we turn our attention to industry-specific components in corporate growth opportunities. The idea is that, if the results on *CSGOs* are due to corporate growth options being priced more similarly across countries regardless of the difference in their economic fundamentals, then we should see no change—or even a decrease—in the role of industry-specific components. We thus repeat our analysis using the industry-specific growth opportunities (*ISGOs*), and find that the *ISGOs* become *more important* as the country experiences greater financial openness. Moreover, consistent with the earlier results on *CSGOs*, the increased *ISGOs* are found to be stronger in small firms. As a result, the difference in *ISGOs* between small and large firms decreases with financial globalization. In sum, the weaker *CSGOs* associated with financial openness—especially in small firms—are accompanied by more distinct growth options in the dimension of industry—again for small firms in particular. This finding thus supports that the weaker *CSGOs* are an indication of corporate growth options becoming better aligned with the global economic fundamentals, which is certainly a good thing.

One may still ask whether such global pricing of corporate growth options is desirable. To the extent that the industry-specific components we measure are justified by economic fundamentals, the observed alignment of growth options by the global industry standards should be deemed beneficial. If, however, the industry components are contaminated by non-fundamental factors, then the conclusion needs to be qualified. Indeed, this concern corresponds to the above-raised issue of whether the q-ratio is a proper proxy for corporate growth options. As a measure based on the market value of corporate assets (mostly equity prices), the q-ratio could contain mispricing and, hence, the stronger *ISGOs* we report above may be attributable to the growing presence of industry-wide mispricing across countries. This scenario, however, does not go that far. As already reported, our findings are limited to small firms. In contrast, industry-wide misvaluation across countries—if any—should be more pronounced in large companies because they are the very target of international investors (Kang and Stulz 1997; Bartram, Griffin, Ng, and Lim 2015).[2]

[2] In Section 4.2, we provide direct evidence that the global factor, proxied by VIX as in Rey (2015), affects large firms disproportionately more than small ones. We also show that the effect of financial openness is independent of that of the global factor.

Finally, we discuss endogeneity. We first remind the reader that reverse causality is not an issue here, because we are not arguing that cross-border capital flows *per se* cause a reduction in *CSGOs*. Such an argument would be needed to make a case for the direct effects of financial globalization. As we focus on its indirect effects in the form of various institutional changes, cross-border capital flows in our analysis are simply an empirical proxy for financial openness and the accompanying changes in domestic institutions. Put differently, our analysis is premised on the existence of domestic institutional changes that occur concurrently with cross-border capital flows and whose effects are reflected in corporate growth options. And our hypothesis is that those institutional changes, by their nature, make corporate growth options depend less on country. In order to isolate the institutional changes that are associated with financial globalization, we include a set of control variables that represent various aspects of domestic institutions, such as trade openness, national wealth, economic growth, and domestic financial markets. While each of those variables is highly likely to affect corporate growth options, it is not clear whether they—once their financial openness-related aspects are taken away by the presence of the capital-flow variable in the regression—have any implication for the extent of corporate growth options being country-specific. Indeed, they are found to have little explanatory power for the *CSGOs*.

To further verify that small firms benefit from their growth options being priced globally, we turn our attention to a real variable. Specifically, we estimate the standard investment-q regression, in which we use four decomposed q-ratios—namely, global, country-specific, industry-specific, and firm-specific parts of the q-ratio. The decomposition is made possible by the earlier-mentioned cross-sectional regression of q ratio on country and industry dummy variables. The estimated intercept of the regression is the global component of the q-ratio, while the regression residuals correspond to the firm-specific part. Finally, the predicted values based on the coefficients for the country and industry dummy variables, respectively, are the country- and industry-specific q-ratios. (See Section 4.3 for details.)

The findings are striking. Typically, small firms' investment is aligned more with country-specific q and less with industry-specific q, compared with large firms. However, as the country becomes financially more open, small firms' investment becomes more responsive to industry-specific growth options and less to country-specific ones. These results are in complete agreement with our earlier findings, namely, that small companies have stronger

CSGOs and weaker *ISGOs* in general but as the country opens up, their *CSGOs* decrease while the *ISGOs* increase.

In conclusion, our paper contributes to the literature by reporting the indirect benefits of financial globalization. Besides, our paper is related to several other lines of research. Bekaert et al. (2007) show that corporate growth opportunities are globally created and exploited when the country's financial sector is open to foreigners. Similarly, Fisman and Love (2004) show that the economic and financial developments cause countries to grow similarly, which implies that the *CSGOs* weaken accordingly. To these studies, our paper adds that financial globalization "liberalizes" small companies from their dependence on country by allowing their growth options to be priced globally than locally and thus enabling those companies to invest more in line with their economic fundamentals.

A handful of studies focus on the differing effects of financial globalization on domestic companies. They include Beck, Demirguc-Kunt, and Maksimovic (2005), Christoffersen, Chung, and Errunza (2006), Gozzi, Levine, and Schmukler (2008), and Beck, Demirguc-Kunt, Laeven, and Levine (2008). Christoffersen et al. (2006) find that stock-market opening benefits large companies more than small firms. Similarly, Gozzi et al. (2008) find that easier access to international capital markets are enjoyed mostly by large firms. However, Beck et al. (2005), based on a survey, note that small firms are particularly more constrained by domestic institutions and, thus, the improvement in institutions will benefit small companies more than large firms. Using the same data, Beck et al. (2008) also find that financial development—which tends to occur simultaneously with financial globalization—helps small firm-dominant industries grow faster than large firm-dominant industries. Our paper contributes to this literature by reporting that financial globalization affects domestic companies, especially smaller firms, by reducing the country-dependence of their growth options and investment and also by aligning them with the global industry standards.

Certainly, studies on the relative importance between country- and industry-specific components in stock returns are related to our paper. Earlier studies have established that country effects are more important than industry effects (e.g., Heston and Rouwenhorst 1994; Griffin and Karolyi 1998; Brook and Del Negro 2004). However, industry effects are not to be ignored and at times appear to be the dominant factor in stock returns (e.g., Cavaglia et al. 2000; Ferreira and Gama 2005; Carrieri, Errunza, and Hogan 2007; Carrieri, Errunza, and

Sarkissian 2008). While not examining stock returns, our study finds that the country-specific components are more important than the industry-specific ones in corporate growth options. Recall, however, that our focus is not to test between the country and the industry effects. Instead, we are interested in small firms' growth options in relation to financial globalization. The two features—i.e., the focus on small firms and the relation to financial globalization—also distinguish our study from An, Bhojraj, and Ng (2010) who study the relative importance between country and industry effects in corporate valuation ratios (book-to-market equity ratio and earnings-to-market ratio) in terms of stock-return predictability.[3]

This paper proceeds as follows. Section 2 explains the sample and data, and Section 3 reports the results on *CSGOs*. Section 4 provides the additional analyses showing that the weaker *CSGOs* are indeed a benefit. Section 5 concludes the paper.

2. Sample and data

To construct the sample, we begin with all Worldscope companies for non-U.S. countries and all Compustat firms for the U.S. over the period from 1991 to 2012. We require both the country and the industry codes to be available, and also the total assets, book value of equity, and market value of equity to be positive. Finally, we require total assets to be greater than or equal to book value of equity. The q-ratio—our proxy for corporate growth opportunities—is then computed as the market value of asset (book value of assets minus book value of equity plus market value of equity) divided by the book value of assets. We treat the q-ratio as missing if it is greater than 100. To further alleviate the extreme value problem, we use the natural log of q-ratio in our analysis.

We assign sample companies into one of the Fama-French 48 industries. Those companies that do not belong to any of the 48 industries are dropped from the sample. Separately, each year we define small (large) firms as those companies whose total assets are below (above) the sample median value within the country. We then require, each year during our sample period, a country to have at least one small firm and one large firm. This is a binding constraint, because some countries may not have data for certain years, in which case those countries

[3] Using data from 1990 to 2006, An et al. (2010) find that the return predictability stems mostly from the idiosyncratic components in stock returns, neither the country-specific nor industry-specific components.

do not make our final sample. We also require a given industry across countries to have at least one small and one large company each year.

We do not include Hong Kong and Taiwan in the sample, because their country-level variables are not available from the data sources we use—e.g., the International Monetary Fund. We also ensure that the country code and country name in the Worldscope database are correctly matched (e.g., code 826 for United Kingdom and not, say, Cayman Islands). As a result, we have 40 countries and 47 industries. As many as 53,365 firms enter our sample at least once and the average number of sample firms in a given year is 22,402.[4]

Table 1 reports some information about our final sample. Panel A in particular shows the list of 40 countries along with the average number of companies in each country. Slightly more than a quarter of the sample firms are from the U.S., followed by Japan that accounts for approximately 14% of the sample. As such, the sample is uneven but it is reasonable as the U.S. companies are considered to set the global standards (Rajan and Zingales 1998). The table also provides the size and q-ratio information for the sample firms, as well as for small and large companies separately, in a given country. The average size (total assets in million US dollars) of small and large firms suggests the existence of several disproportionately large companies in each country (Gabaix 2011). Tobin's q-ratio is generally higher for small firms than for large companies.

In Panel B, we report summary statistics for q-ratios across sample firms and sample years (for all firms and then for small and large firms separately). As we truncate the sample at the q-ratio of 100, the maximum sample q-ratio is 99.27 while the minimum is near-zero. Small firms have a wider range of q-ratio than large firms, both below and above the median. Consequently, the higher q-ratio of small firms is not as pronounced in terms of the median as in mean. Still, the q-ratio is typically higher in small firms than in large firms. Of course, we control for these differences between small and large firms when we analyze their difference in *CSGOs*.

[4] 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 is an obvious error but, instead of artificially correcting the numbers, we exclude the company from the sample.

3. Empirical results

3.1. Country-specific growth opportunities (CSGOs)

We now estimate the following year-by-year cross-sectional regression to quantify the country-specific components in corporate growth opportunities while controlling for the industry-specific components:

$$\ln q_k = \alpha + \sum_c \beta_c * CNTRY_c + \sum_i \gamma_i * INDST_i + \varepsilon_k , \quad (1)$$

$$s.t. \ \sum_c \beta_c = 0 \ \text{and} \ \sum_i \gamma_i = 0 ,$$

where $\ln q_k$ is the natural log of firm *k*'s q-ratio, $CNTRY_c$ is the 0/1 dummy variable for country *c*, and $INDST_i$ is the 0/1 dummy variable for industry *i*.[5] We also re-estimate Eq. (1) separately for small and large firms.

To obtain a summary measure for the overall *CSGOs*, we sum the absolute values of the estimated β_c's across countries; that way, we have one number for each year. Similarly, we separately sum the absolute values of the β_c's that are estimated only with small firms and those with large firms; consequently, we obtain one annual measure of small firms' *CSGOs* and the one for large firms. We plot those three annual time-series in Figure 1 (top panel).

The figure shows that there are sizable *CSGOs* and they are more pronounced in small firms. The economic magnitude of the estimated *CSGOs* can be computed as follows. The small-firm *CSGOs* in the figure, when averaged across time, are 7.95. Since it is an aggregate number that is summed across 40 countries, the cross-country average is 7.95/40 or 0.199. Since we use the natural log of q as the dependent variable in this specification, the average *CSGOs* for small firms—i.e., 0.199—means that a typical small firm's q is deviating from the global small-firm average by 22% (i.e., $e^{0.199} - 1$) *due to the country-specific components*. In

[5] Note that the two constraints do not use any weighting scheme. Compared to the case where those coefficients are weighted by the number of firms in the corresponding country or industry, our approach allows a larger coefficient for the country or industry with more firms. Specifically, if the constraint were $\sum n_c * \beta_c = 0$, where n_c is the number of firms in country *c*, the resulting estimate for β_c would be smaller than ours by the order of $1/n_c$. We use this non-weighted constraint so that the coefficient is affected more by the countries and industries with more firms. In words, the constraints in Eq.(1) effectively weight the country- and industry-specific components by the number of companies in each country and industry, respectively.

contrast, the deviation of the large-firm q due to the country-specific components is 13.7% ($e^{0.128} - 1$). Following the same procedure, the *CSGOs* for all firms suggest that the country-specific components account for approximately 16% of corporate growth options.

Another way of putting the estimated *CSGOs* into perspective is to compare them with industry-specific growth opportunities (*ISGOs*). To this end, we repeat the analysis using the estimated γ's (for all firms, small firms only, or large firms only). The bottom panel of Figure 1 shows virtually no difference between small and large firms. While large companies have somewhat more industry-specific components in their growth opportunities than small companies, industry-specific components in small firms' growth options are only 2% smaller than those of large firms. The lack of difference, however, is not due to the limited role of industry in corporate growth opportunities. As evident in the two panels of Figure 1, the *ISGOs* are just only slightly smaller than the *CSGOs*, although such comparison is not the goal of this paper.

One potential issue with Figure 1 is that Eq. (1) is estimated separately for small and large firms. That is, their *CSGOs* and *ISGOs* are measured against different benchmarks (i.e., the intercepts of each regression). While the two intercepts turn out to be quite close to each other (not reported), we attempt to ensure the robustness of the results by estimating an alternative equation that imposes one common intercept. Specifically, we estimate:

$$\begin{aligned} \ln q_k = {} & \alpha \\ & + \sum_c \beta_{c,small} * CNTRY_c * SM_c + \sum_c \beta_{c,large} * CNTRY_c * LG_c \\ & + \sum_i \gamma_{i,small} * INDST_i * SM_c + \sum_i \gamma_{i,large} * INDST_i * LG_c + \varepsilon_k \end{aligned} , \qquad (2)$$

$$s.t. \sum_c \beta_{c,small} + \sum_c \beta_{c,large} = 0 ,$$

$$\sum_i \gamma_{i,small} + \sum_i \gamma_{i,large} = 0 ,$$

$$\sum_c \beta_{c,small} + \sum_i \gamma_{i,large} = 0 , \text{ and}$$

$$\sum_i \gamma_{i,small} + \sum_c \beta_{c,large} = 0 .$$

where SM_c (LG_c) is a 0/1 dummy variable for small (large) companies in country c. Other variables are already defined in Eq. (1). In essence, Eq. (2) additionally includes a dummy for small firms and another one for large companies, and has them interact with the country and the industry dummy variables. Note also the changes in the constraints: the set of four constraints are imposing the zero-sum condition on any combinations between small and large companies. Otherwise, the intercept – the benchmark – would be biased between the two groups of companies and cannot remain neutral.

Figure 2 shows that this alternative specification makes virtually no change to the earlier results. Namely, we continue to observe the significant *CSGOs* for all firms and the greater *CSGOs* in small firms than in large companies (top panel), as well as the little difference in *ISGOs* between the two size-sorted groups (bottom panel). The similarities between Figures 1 and 2 suggest that using different benchmarks for small and large firms do not cause much bias. In the following analysis, however, we use the estimates from this one-regression specification to avoid any measurement issues.[6]

3.2. CSGOs and financial globalization – Cross-country analysis

Basic setup

We now associate a country's *CSGOs* with the degree of its financial openness. To this end, we estimate the following regression:

$$Depvar_{c,t} = a + b * FinOpen_{c,t} + \sum_k c_k * Control_{c,k,t} + y_t + e_{c,t}, \quad (3)$$

where $Depvar_{c,t}$ is one of the following: the *CSGOs* of country *c* in year *t* (i.e., β_c estimate in absolute terms from Eq. (1)), the *CSGOs* of country *c*'s small firms in year *t* (i.e., $\beta_{c,small}$ estimate in absolute terms from Eq. (2)), the *CSGOs* of country *c*'s large firms in year *t* (i.e., $\beta_{c,large}$ estimate in absolute terms from Eq. (2)), and the difference in *CSGOs* between small and large firms in country *c* in year *t* (i.e., the absolute value of the difference between $\beta_{c,small}$ and $\beta_{c,large}$). Hereafter, those estimates are denoted by $CSGOs_{\text{all}}$, $CSGOs_{\text{small}}$, $CSGOs_{\text{large}}$, and

[6] To further ensure the robustness of our results, we used the raw q-ratio (i.e., not in log) as the dependent variable and found a very similar result to Figures 1 and 2. We also used the log q-ratio that is truncated at the 1 and 99 percentiles and found that the patterns in the figures are robust to using this alternative dependent variable. The results are available upon request.

CSGOs$_{diff}$, respectively. It is a panel regression with country-year observations and, in order to examine the cross-section at the country level, we use the year fixed-effects (y_t).

We need to detail how we measure the degree of a country's financial openness. For the cross-country analysis here, we use the sum of a country's foreign assets and foreign liabilities, divided by its GDP. The resulting variable is effectively the cumulative gross capital flows over time. That is, our measure presumes that countries with more cross-border capital flows—not just during the current period but also in the past, and both inflows and outflows—are more open financially.[7] Again, we stress that our hypothesis is not on the effects of foreign capital flows *per se* on domestic companies. As a country's financial openness is a multi-dimensional phenomenon that affects and is affected by many other aspects of the country, we seek to quantify its indirect effects. Our capital flow-based measure is an empirical proxy for the country's financial openness.

In order to establish a relationship between *CSGOs* and financial openness, we need to control for other country characteristics that are not directly related to financial openness. We thus include in the regression credit market size, stock market size, stock market turnover, log GDP per capita, GDP per capita growth, and trade openness. In addition, we control for the median firm size (total assets) of a country, the number of firms in a country, the median q-ratio of a country, and the cross-sectional standard deviation of q-ratios within a country (all variables in log). When the *CSGOs*$_{small}$ or the *CSGOs*$_{large}$ are used as the dependent variable, the control variables are computed only with small or large firms in the country. With the *CSGOs*$_{diff}$ as the dependent variable, we use the log difference in a given variable between small and large firms, except that the number of firms is the total number of firms in a country. Controlling for those variables is important because otherwise the results could be spurious.

Summary statistics

Table 2, Panel A, reports the summary statistics of the regression variables. The first four rows are the dependent variables (i.e., *CSGOs*$_{all}$, *CSGOs*$_{small}$, *CSGOs*$_{large}$, and *CSGOs*$_{diff}$) and they are followed by the measure of financial openness and the control variables. The average

[7] Luxemburg is excluded from the regression analysis, since its foreign assets and liabilities are more than 100 times of the country's GDP. Not using Luxemburg is common in the international finance and economic literature. See, e.g., Feldstein and Horioka (1980) and Tesar (1991).

CSGOs in a given country ($CSGOs_{all}$) is 0.140 and this estimate is slightly lower than our earlier result in Section 3.1 (0.151, which is the average of the "all-firm" line in the top panel of Figure 1). The difference stems from the fact that we now require data for financial openness (i.e., foreign assets and liabilities). Considering that such data are available only after the country is financially open to some extent, a lower estimate of *CSGOs* in this section (i.e., a higher value for *CSGOs* in the unscreened sample in Section 3.1) is not surprising.[8] The table confirms, again, the more pronounced *CSGOs* in small firms than in large companies (0.188 vs. 0.120, on average). In Section 3.1, the estimates are 0.199 and 0.128, respectively, and the *CSGOs* estimates in this screened sample are predictably lower than in the earlier unscreened sample.

The difference estimate ($CSGOs_{diff}$) needs explaining. In this analysis, we first compute the difference between $\beta_{c,small}$ and $\beta_{c,large}$ each year for each country, and then take the absolute value of the difference. While not corresponding to $CSGOs_{small} - CSGOs_{large}$, the $CSGOs_{diff}$ correctly gauges how far apart the growth options of small and large firms are. Put differently, the $CSGOs_{diff}$ is the log difference in (the country-specific component-driven) q between small and large firms, in absolute terms. This variable allows us to understand small firms with their large-size country peers as a benchmark.

The variable of interest is *FinOpen*, our proxy for a country's financial openness. As explained above, it is the ratio of foreign assets and liabilities to GDP. The average value is 1.805 but the median is 1.023, with a maximum of 28.971. As such, the variable is heavily right-skewed. To mitigate the extreme-value problem, we alternatively employ several dummy variables, as well as the original continuous one, in the regressions. Other control variables are also reported in Table 2 and do not seem to raise any outlier issue.

In Panel B, we examine whether there is a difference in the *CSGO* estimates between when the signed $CSGOs_{all}$ is positive (i.e., "country premium" case) and when it is negative (i.e., "country discount" case). Except for $CSGOs_{small}$, there is no reliable difference between the two cases. The pattern in $CSGOs_{small}$ is interesting. Its magnitude is greater when the country as a whole experiences a discount than when the country enjoys a premium. This observation suggests that the country-specific components for small firms are more of a

[8] We do *not* treat the missing foreign assets and liabilities as zero.

constraint rather than a privilege, thereby lowering their growth opportunities below the global average.

Regression results

Table 3, Panel A, reports the panel regression results. As shown at the top of the table, a country's financial openness is significantly and negatively associated with each of the four *CSGOs* estimates. Since the regressions include year fixed-effects, the results are indeed a cross-country pattern. That is, the negative coefficients on *FinOpen* indicate that corporate growth options are less country-specific in countries that are financially more open than in closed countries. More interestingly, the significant and negative relations of *FinOpen* to $CSGOs_{small}$ is much more negative and significant than *FinOpen*'s relation to $CSGOs_{large}$. Further supporting this observation, the $CSGOs_{diff}$ is also significantly and negatively related to *FinOpen*. The finding that the growth opportunities of small firms are affected more than are those of large companies is consistent with the indirect effects of financial globalization. It is, however, difficult to reconcile with the direct benefits.

To ensure robustness of the results and also better understand the economic magnitude, we replace the original (i.e., continuous) *FinOpen* with a 0/1 dummy variable representing the above-median countries (Panel B) or with two 0/1 dummy variables each corresponding to the above-q3 and to the below-q1 countries (Panel C). The estimated coefficients on the above-median dummy with $CSGOs_{small}$ in Panel B is again more negative than the one with $CSGOs_{large}$. Consequently, the $CSGOs_{diff}$ is significantly and negatively related to the dummy, confirming the greater effect of financial openness on small-size companies. Note that the estimated coefficient of -0.045 corresponds to the mean difference in $CSGOs_{diff}$ between the above- and below-median countries. The coefficient in Panel C for the above-q3 countries is even bigger at -0.069. Given that the average $CSGOs_{diff}$ is 0.155 and the dummy for the below-q1 does not enter the regression significantly, we can infer that the $CSGOs_{diff}$ of the above-q3 countries is, on average, 0.10325. That is, the difference in country-specific q between small and large firms in financially more open countries is approximately 1.1 (from $e^{0.10325}$)—i.e., 10% above or below the global average, whereas in the rest of the countries, it is 1.2 (from $e^{0.17225}$) or the 20% deviation from the global average.

In an unreported result, we also examined any asymmetry in our results by allowing the coefficient on *FinOpen* to vary between the country-premium and the country-discount cases. We did so by introducing a dummy variable for the country-premium case and its interactive term with the financial-openness variable. We found that the effect of financial openness on *CSGOs* is not reliably different, as the interactive terms are all insignificant.[9]

Endogeneity

While our openness measure, *FinOpen*, is based on cross-border capital flows, we are not trying to find the effects of capital flows *per se*. As explained in the introduction, we are using this flow-based measure on the grounds that a country's financial openness and the associated changes in the country's institutions are positively correlated with the magnitude of cross-border capital flows. What we are aiming at is those institutional changes and the capital flows are simply the empirical proxy for those. Thus, it is a moot point whether or not the capital flows cause the observed patterns in *CSGOs*. It is necessary, however, to isolate the institutional changes that are associated with financial globalization and control for other, unrelated changes.

This notion begs an inspection of the control variables, so that we can be assured that other country characteristics not directly related to financial openness are correctly taken into account. In our regressions, we are controlling for the degree of a country's financial development and economic development to correctly isolate the effects of financial openness on the results. Reading the coefficient on the control variables in Table 3, the size of the credit and stock markets (*Credit* and *Stock*) are not reliably associated with *CSGOs*, suggesting that once the financial-openness aspect is controlled for, financial development does not affect the country-dependency in corporate growth options.[10] It is interesting to see the stock-market turnover (*Tover*) to be differently related to $CSGOs_{small}$ and to $CSGOs_{large}$. However, this variable is not significantly related to the difference in *CSGOs* between small and large firms.

[9] The results are available upon request.

[10] This "no-result" of the financial development measures is not impossible. For instance, if well-developed credit markets make local companies dependent on local markets, then it would hamper corporate growth options from being priced by the global standards.

The degree of economic development is controlled via two variables, namely, GDP per capita (*GDP*) and its growth (*GDPgrw*). The wealth of a country (i.e. *GDP*) is significantly and negatively related to each of $CSGOs_{all}$, $CSGOs_{small}$, and $CSGOs_{large}$. However, due to this universal impact on local firms, *GDP* does not explain the cross-firm difference. It is interesting to note that, in Panels B and C where we employ dummy variables for financial openness, *GDP* loses its significance. It appears that the overarching dummy variables capture the effect of economic development as well as that of financial openness. The coefficient on *GDPgrw* suggests that the country-dependency of large firms' growth opportunities, but not that of small firms, is weaker in fast-growing countries. However, the variable has little explanatory power for the difference between the two groups of companies.

The degree of trade openness, denoted by *TrdOpen*, is measured by the ratio of import and export to GDP and it is significantly and positively related to the *CSGOs* of large firms. That is, countries with more international trades tend to have more country-specific components in large firms' growth opportunities. We conjecture that this result obtains as the international trades of some countries concentrate in their large companies in different industries. Since it is not the variable of our main interest, we do not conduct further investigation.

In addition to the macroeconomic controls above, we employ four additional variables that are constructed with firm-level data in a given country for a given year. They are the median firm size (total assets), the median q-ratio, the cross-sectional standard deviation of q-ratio, and the number of companies. All four variables are computed within a country or in the country's small-firm or large-firm subset. (All variables are first computed and then put in log to enter the regression.) When the dependent variable is the $CSGOs_{diff}$, we replace the median firm size, the median q-ratio, and the standard deviation of q-ratio with their differences between small and large firms; for the number of firms, we use the total number of firms in the country.

It turns out that those four variables all explain the difference in *CSGOs* between small and large firms. Specifically, the estimated coefficients and their signs indicate that the countries with more firms and a smaller difference in size, q, or q-dispersion between small and large firms tend to have a smaller $CSGOs_{diff}$. While these results are to some extent

expected, they are not mechanical or tautological by any means. More importantly, *FinOpen* survives all these controls.

In sum, the regression results in this section establish a cross-country pattern, namely, that the countries that are financially more open have less pronounced *CSGOs*, especially for small firms, and thus also have a narrower gap in *CSGOs* between small and large companies than financially closed countries. Next section turns to the within-country perspective.

3.3. CSGOs and financial globalization – within-country analysis

Basic setup

We now turn to the association of *FinOpen* with *CSGOs* within a country. Since the two variables are likely to be non-stationary, we use their 1st difference and also employ the country fixed-effects in the panel regressions. A significant and negative coefficient on Δ*FinOpen* against Δ*CSGOs* would then indicate that, as a country becomes financially more open, its corporate growth opportunities contain fewer country-specific components. Also, with changes in $CSGOs_{small}$ or in $CSGOs_{diff}$ as the dependent variable, a significant coefficient on Δ*FinOpen* would mean that, as a country becomes more open financially, small firms in particular see their growth opportunities to be priced globally than locally.

To that end, we estimate the following regression:

$$\Delta Depvar_{c,t} = a + b * \Delta FinOpen_{c,t} + \sum_k c_k * \Delta Control_{c,k,t} + y_t + c_c + e_{c,t}, \quad (4)$$

where $\Delta Depvar_{c,t}$ is the annual change (from year *t*-1 to year *t*) in one of the four dependent variables for Eq. (3). That is, it is one of $\Delta|\beta_c|$, $\Delta|\beta_{c,small}|$, $\Delta|\beta_{c,large}|$, and $\Delta|\beta_{c,small} - \beta_{c,large}|$. The regressors are the same as those in Eq. (3) except that we now use their annual changes. Note that, in order to examine the within-country variation, we use the country fixed-effects (c_c) along with the year fixed-effects (y_t).

Regression results

Table 4 shows the regression results. It is evident that changes in a country's financial openness—i.e., Δ*FinOpen*—are significantly and negatively related to changes in the *CSGOs* of all firms ($\Delta CSGOs_{all}$) and of small firms ($\Delta CSGOs_{small}$). However, Δ*FinOpen* is insignificant

when the changes in large firms' *CSGOs* are used as the dependent variable. Consequently, Δ*FinOpen* is significantly and negatively related to Δ$CSGOs_{diff}$. The results mean that as a country becomes more open financially, a convergence occurs between the growth options of small and of large firms due to the reduction in country-dependence of small firms' growth options.

The economic magnitude of the results is huge. With Δ$CSGOs_{small}$ as the dependent variable, the coefficient for Δ*FinOpen* is -0.042. When we multiply this coefficient with one standard deviation of Δ*FinOpen* (0.472), it is -0.019824. That is, the changes in small firms' country-specific growth options are approximately 2% (i.e., $e^{-0.019824}$). This is a huge change given that the average change in small firms' country-specific growth options is less than 0.2% in absolute terms.

Among the control variables, the role of GDP growth (Δ*GDPgrw*) is unmistakable. Specifically, the estimated coefficient is significant and negative, meaning that a country's *CSGOs* weaken as the country grows faster. However, this effect is common to both small and large companies and, thus, has no explanatory power for the $CSGOs_{diff}$.

4. Are the weaker *CSGOs* beneficial?

4.1. Industry-specific growth opportunities (ISGOs)

Can the weaker *CSGOs*—especially those of small firms—be due to a growing presence of a "global factor" that would make companies from different countries similar to each other? One way of evaluating this possibility is to gauge the industry-specific growth opportunities (*ISGOs*). The idea is that, if our results on *CSGOs* are due to a global factor making corporate growth options similar countries regardless of the difference in their economic fundamentals, then we should see no change -- or even a decrease -- in the role of industry-specific components.

Our estimates of *ISGOs* are for a given industry across countries (i.e., γ_i in Eq. (1)) and thus we need to convert them to country-specific measures. We do so using the following procedure. Each year within a country, we compute the fraction of firms that belong to each of the industries in the country. For example, if a country has 10 firms in automobiles and 20 in electronics (and no other industries), then the auto industry is given a value of 1/3 and the electronics 2/3. We then use those fractions as weights to compute the weighted average

ISGOs within the country. That is, $|\gamma_{auto}|$* (1/3) + $|\gamma_{electronics}|$ *(2/3), in which γ_i are estimated by Eq. (1).

For the *ISGOs* of small or large firms and their difference, we use the estimates of Eq. (2), namely, $\gamma_{i,small}$ and $\gamma_{i,large}$. Specifically, in each country, we compute the fraction of small or large firms in each industry. Continuing on the earlier example, suppose that the auto industry has 3 large firms and 7 small firms, while there are 12 large and 8 small electronics companies. Then the small-firm *ISGOs* of this country is $|\gamma_{auto,\ small}|$ * (7/15) + $|\gamma_{electronics,\ small}|$ *(8/15). Similarly, the country's large-firm *ISGOs* is $|\gamma_{auto,\ large}|$ * (3/15) + $|\gamma_{electronics,\ large}|$ *(12/15). Finally, the difference in industry effect between small and large firms in our example is $|\gamma_{auto,\ small} - \gamma_{auto,\ large}|$ * (1/3) + $|\gamma_{electronics,\ small} - \gamma_{electronics,\ large}|$ * (2/3).

Table 5 reports summary statistics for the resulting *ISGOs*. We make three observations. First, the magnitude of industry-dependence of growth options is nearly comparable to that of country dependence. We cannot directly compare the numbers in Table 2 and those in Table 5, since the *ISGOs* here are reconstructed to represent the industry-dependence of a given country. Besides, such a comparison is not our goal in this paper. Still, we note that *ISGOs* is far from being negligible. Second, unlike the *CSGOs*, there are more industry-specific components in large firms' growth options than in small-firm growth opportunities. Third, the difference in *ISGOs* between small and large firms is limited. With those *ISGOs* estimates, we examine the cross-country pattern by using Eq. (3) where the dependent variable is now $ISGOs_i$ (with the subscript i being "all", "small", "large", or "diff").

Table 6, Panel A, shows that *FinOpen* is significantly and positively related to $ISGOs_{all}$ and $ISGOs_{small}$. Surprisingly, it is significantly and negatively related to $ISGOs_{large}$, although the difference between small and large companies does not show any reliable relationship with *FinOpe*n. Before making any inference from those estimates, we first ensure the robustness of the results by replacing the continuous openness measure with dummy variables. Panels B and C of Table 6 show that the coefficient on *FinOpen* is most significant when the dependent variable is $ISGOs_{small}$. Therefore, the interpretation is that small companies in financially open counties have more industry-specific components in their growth opportunities than small companies in financially closed countries. The results on the $ISGOs_{all}$ are also reliable, although this pattern appears to be driven by the divergence between the most open countries (i.e.,

above-q3 countries) and the rest. Finally, the insignificant coefficient of *FinOpen* for the $ISGOs_{diff}$ also remains robust.

We now turn to the within-country analysis by utilizing Eq. (4). Table 7, Panel A, shows that changes in *FinOpen* is significantly and positively related to changes in all firms' and small firms' *ISGOs*. This result is consistent with the cross-country result above and indicates that, as a country becomes more open financially, the growth opportunities of its companies—especially those of small firms—are better aligned with the global (i.e., country-neutral) industry fundamentals. Consistent with the preceding cross-country analysis, Δ*FinOpen* is unrelated to $\Delta ISGOs_{large}$. Consequently, the difference in *ISGOs* between small and large firms *decreases* with financial openness. That is, small firms catch up with their larger-size country peers in terms of the extent to which their growth options are aligned with global standards.

4.2. Role of global factor – An analysis of VIX

To further investigate the role of a global factor that would make *CSGOs* similar across companies regardless of their economic fundamentals, we include in the regression the VIX index as another control. Prior studies have documented that cross-border capital flows have a commonality and it is negatively related to VIX (e.g., Rey 2015). That is, more capital flows across countries, the lower is the VIX index. We thus take a negative value of the average VIX during a year—denoted hereafter by *negVIX*—and use its annual change (i.e., from the last year's average to this year's average) as an additional control in the within-country regressions.

By construction, this variable has the same value for a given year across all countries. Using Δ*negVIX* together with year fixed-effects would thus eliminate its only variation (in time-series) from the VIX variable. For this reason, we employ this additional control variable without year fixed effects. In a sense, the analysis in this section is to replace the year fixed effects with a single variable whose value changes over time. Our goal here is to see whether Δ*FinOpen* survives this additional control.

Table 8 reports the six sets of regression results. As shown in the first two columns, the relationship between small firms' growth options ($\Delta CSGOs_{small}$ and $\Delta ISGOs_{small}$) and financial openness (Δ*FinOpen*) is robust to controlling for changes in VIX. While the increase in *ISGOs* with financial openness weakens in the presence of the VIX variable, the openness variable

only slightly misses the significance (*p*-value=0.115). The results on large firms' growth options ($\Delta CSGOs_{large}$ and $\Delta ISGOs_{large}$), reported in the next two columns, also show that Δ*FinOpen* mostly maintains its coefficient in the presence of Δ*negVIX* (i.e., a significant and negative coefficient with $\Delta CSGOs_{large}$ and an insignificant coefficient with $\Delta ISGOs_{large}$).

One noticeable pattern is that the coefficient on Δ*negVIX*, when regressed on Δ*CSGOs*, is greater (in absolute terms) for large companies than for small firms. In contrast, the coefficient on Δ*FinOpen* is larger in magnitude for small firms than for big companies, again when regressed on Δ*CSGOs*. At a minimum, these observations indicate that the two variables have different effects on corporate growth options.

The last two columns in Table 8 are for the regressions whose dependent variables are $\Delta CSGOs_{diff}$ and $\Delta ISGOs_{diff}$, respectively. It is indeed telling that Δ*negVIX* has no explanatory power for the difference in *CSGOs* between small and large companies, whereas Δ*FinOpen* continues to be significant and negative (i.e., it contributes to the convergence of small and large firms' growth options). With $\Delta ISGOs_{diff}$ as the dependent variable, both variables enter the regression significantly but they have different signs of coefficients. Specifically, Δ*negVIX* has a positive coefficient (i.e., it contributes to a *wider ISGO*-gap) whereas Δ*FinOpen* has a negative one (i.e., it reduces the gap). As mentioned in the preceding paragraph, this finding confirms that the effect of financial openness is independent of the global trend proxied by VIX.

4.3. Impact on real variables – An analysis of investment-q sensitivity

Basic setup

We now turn our attention to real – as opposed to financial – variables. Specifically, we estimate the standard investment-q regression to gauge the relevance of the q-ratio – our proxy for corporate growth options – for the corporate investment policy. In doing so, we decompose the q-ratio into the global, country-specific, industry-specific, and firm-specific components and examine the role of each one in corporate investment. The decomposition is made possible by Eq. (2), from which the estimated intercept (α) is the global component in q-ratio and the estimated β and γ multiplied by the country, the industry, and the size dummy values for a given firm provide the country- and industry-specific q's for that firm.

Finally, the regression residual (ε) for the firm represents its firm-specific component in q-ratio.

As a baseline specification, we estimate the following regression:

$$\begin{aligned} I_{k,c,i,t} = \alpha & \\ & + \beta_G * G\mathrm{q}_{t-1} + \beta_C * C\mathrm{q}_{c,t-1} + \beta_I * I\mathrm{q}_{i,t-1} + \beta_F * F\mathrm{q}_{k,t-1} \\ & + \beta_{cf} * cf_{k,t} + \beta_{sz} * sz_{k,t-1} \\ & + \varepsilon_{k,c,i,t} \end{aligned}, \tag{5}$$

where $I_{k,c,i,t}$ is the investment by firm *k* that belongs to country *c* and industry *i* during year *t*, as measured by the changes in total assets during the year, divided by total assets at the end of year *t*–1. $G\mathrm{q}_{t-1}$, $C\mathrm{q}_{t-1}$, $I\mathrm{q}_{t-1}$, $F\mathrm{q}_{t-1}$ are, respectively, the global, country-specific, industry-specific, and firm-specific components of q-ratio at the end of year *t*–1. Cash flows of firm *k* during year *t* ($cf_{k,t}$) are measured by the sum of the income before extraordinary items and the depreciation and amortization, divided by total assets at the end of year *t*–1. Finally, firm size ($sz_{k,t-1}$) is the natural log of total assets at the end of year *t*–1. While the q-ratio has already been truncated at 100 (see Section 2), the other three variables (*I*, *cf*, and *sz*) do contain extreme values. We thus truncate them at the 1st and the 99th percentiles. We compute the mean values for each company and for each year (within a country), and de-mean the original variable with the two means. Thus, Eq. (5) is equivalent to a panel regression with firm and (country-specific) year fixed effects.

Regression results

Model (1) in Table 9 reports the baseline regression results. As well established in the literature (e.g., Fazzari, Hubbard, and Petersen 1988), cash flow enters the regression positively while firm size does so with a negative coefficient. All four q variables are also positively related to corporate investment, suggesting that the q-ratio is a good proxy for corporate growth opportunities. Our ultimate goal is to detect any difference between small and large firms in the investment-q link and the impact of financial openness on this relationship. Thus, we modify Eq. (5) by adding a dummy variable for small firms, D_{small}, and have it interact with each of the six regressors.

This modified Eq. (5) is the Model (2) in Table 9. Its estimates indicate that the investments of small firms are less sensitive to the global, industry-specific, and firm-specific q-ratios than those of large firms. More important, however, small-firm investment is *more* sensitive to the country-specific q-ratio than large companies. Indeed, this is consistent with our earlier finding, namely, that small-size firms have more *CSGOs* than do large companies.

What about financial openness? To see its effect on the investment-q link, we split the sample into two groups. More specifically, we create a dummy variable representing the high degree of financial openness, D_{open}, and separately examine the observations whose D_{open} is zero and those with a value of one for the dummy variable. To construct D_{open}, we first de-mean Δ*FinOpen* by the country-specific and the year-specific average values and then assign a value of one to the observations whose de-meaned values are greater than or equal to the sample median. That way, we identify the observations for which the country is becoming more open financially.

When Model (2) is estimated separately in each sub-sample, the most pronounced finding is that the greater sensitivity of small firms' investment to the country-specific q-ratio is found only when the openness measure is below the sample median (i.e., the sub-sample of D_{open}=0). In the other sub-sample (i.e., the one with D_{open}=1), the country-specific q and investment link is not significantly different between small firms and large companies. This sub-sample result further confirms our finding above, namely, that small firms' country-dependence of growth options is mitigated as the country becomes more open financially.

In addition, the sub-sample analysis reveals two other notable patterns. One is that the coefficient for Iq*D_{small} is much less negative in the high-openness sub-sample than in the low-openness one (-0.052 *vs*. -0.105). It implies that small companies are relatively more responsive to the *ISGOs* (albeit still less so than large ones) as the country becomes more open financially. The other pattern is that the coefficient for Fq*D_{small} is also less negative in the sub-sample of D_{open}=1 than in the sub-sample of D_{open}=0 (-0.036 *vs*. -0.055). The interpretation is that small companies become relatively more responsive to their own signal about growth opportunities (again, although still less so than large firms) as the country becomes more open financially.

To formally test those patterns and also to ensure the robustness of the already-tested results, we estimated the following, full-blown equation:

$$
\begin{aligned}
I_{k,c,i,t} = {} & \alpha + \sum_{x}^{X} (\beta_x * X_{x,t}) \\
& + \alpha_1 * D_{small} + \sum_{x}^{X} (\gamma_x * X_{x,t} * D_{small}) \\
& + \alpha_2 * D_{open} + \sum_{x}^{X} (\lambda_x * X_{x,t} * D_{open}) \\
& + \alpha_3 * D_{small} * D_{open} + \sum_{x}^{X} (\varphi_x * X_{x,t} * D_{small} * D_{open}) + \varepsilon_{k,c,i,t}
\end{aligned}
\quad , \qquad (6)
$$

where $X_{x,t}$ is the full set of regressors in Eq. (5).

We are particularly interested in the estimated ϕ's, which are the difference-in-difference estimates. They can test whether there is an openness effect *unique to small firms* (compared to large companies), or equivalently, whether there is an *additional small-firm effect* during the high-openness state (compared to low-openness state).

The results are reported under Model (3) in Table 9. They confirm all three findings in Model (2) with sub-samples, namely, that small companies become less dependent on country-specific growth options (i.e., negative coefficient for *C*q*D_{small}*D_{open}), that their investment is more aligned with industry-specific growth options (i.e., positive coefficient for *I*q*D_{small}*D_{open}), and that small-size companies pay more attention to their own signals when making investment decisions (i.e., positive coefficient for *F*q*D_{small}*D_{open}), as their country becomes more open financially.

In sum, the results in this section confirm that small firms, in the first place, are more dependent on the country-specific growth options than large firms but that this dependency decreases with financial openness. At the same time, although small firms' reference to the industry-specific growth options is, again in the first place, weaker than that of large companies, financial globalization improves this weak link to economic fundamentals. Finally, small firms respond more to their own signals about growth options as the country becomes more open financially.

5. Conclusions

In this paper, we examine the extent to which corporate growth opportunities—especially those of small firms—depend on country, in relation to financial globalization. It is an attempt

to detect the indirect impacts of financial globalization, which materialize in the form of various changes in domestic institutions, such as more developed financial markets and improved corporate governance. Small-size companies are useful in isolating those indirect impacts, because they are mostly denied direct access to foreign capital and thus are free from the direct impacts. Being constrained by various market frictions, however, small firms are certainly subject to the institutional changes associated with financial globalization. In particular, those institutional changes—given their broad-based and persistent nature—are likely to affect the present value of small firms' growth options rather than the assets in place. While it is not clear whether those institutional changes are good news to small firms' growth perspective (because, for example, they may end up facing fiercer competition from abroad or more severe market discipline), the impact—if any—will materialize in a way that the growth options become less dependent on country.

Using data for 53,365 firms from 40 countries over the period of 1991-2012, we indeed find that the country-dependence of small firms' growth opportunities decreases with financial openness. To see whether the reduced country-dependence is a benefit, we examine the country-neutral and industry-specific component in small firms' growth opportunities, and find that this component increases with financial openness. Small firms are also found to invest more in line with industry-specific growth opportunities and less with country-specific growth opportunities, as financial globalization progresses. Furthermore, their investment becomes more responsive to firm-specific growth opportunities. In sum, we conclude that small firms benefit indirectly from financial globalization via their growth opportunities and investments being better aligned with economic fundamentals.

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Table 1. Sample characteristics

This table reports the average number of sample firms and their size and q-ratio by country (in Panel A) and th summary statistics of Tobin's q-ratio across sample countries and sample years (in Panel B). The sample period is from 1991 to 2012.

Panel A: Sample countries and characteristics of sample firms

Country	Avg. # of firms	Avg. firm size (in million U$)			Avg. q-ratio		
		all	small	large	all	small	large
ARGENTINA	61	1,283	131	2,409	1.71	2.28	1.16
AUSTRALIA	970	1,891	38	3,753	1.95	2.39	1.51
AUSTRIA	89	5,836	122	11,470	1.41	1.64	1.18
BELGIUM	141	10,459	105	20,758	1.36	1.52	1.21
BRAZIL	94	6,102	366	11,934	1.26	1.37	1.16
CANADA	1,347	2,168	38	4,295	2.20	2.91	1.49
CHILE	147	1,352	90	2,618	1.75	2.15	1.34
CHINA	1,092	1,878	111	3,644	2.16	2.58	1.74
COLOMBIA	33	2,348	222	4,393	1.07	1.06	1.08
DENMARK	225	2,326	54	4,593	1.39	1.36	1.42
FINLAND	126	1,894	77	3,695	1.51	1.65	1.38
FRANCE	711	9,558	61	19,044	1.51	1.74	1.28
GERMANY	689	8,397	54	16,724	1.73	2.02	1.43
GREECE	213	1,616	45	3,216	1.62	1.82	1.43
INDIA	918	719	34	1,403	1.67	1.69	1.66
INDONESIA	244	626	44	1,214	1.35	1.31	1.40
IRELAND	64	6,571	59	12,995	2.22	2.14	2.31
ITALY	243	13,298	242	26,313	1.26	1.34	1.18
JAPAN	3,194	4,655	161	9,150	1.30	1.42	1.17
KOREA(SOUTH)	879	2,182	155	4,203	1.11	1.21	1.01
LUXEMBOURG	34	6,150	179	11,949	1.31	1.32	1.29
MALAYSIA	646	674	50	1,299	1.39	1.53	1.26
MEXICO	107	2,646	309	5,003	1.34	1.27	1.41
NETHERLANDS	163	14,129	127	28,049	1.63	1.77	1.50
NEW ZEALAND	91	594	45	1,139	1.63	1.96	1.30
NORWAY	166	2,230	83	4,366	1.60	1.99	1.22
PAKISTAN	135	282	23	543	1.31	1.31	1.30
PERU	77	577	48	1,098	1.64	1.59	1.68
PHILIPPINES	159	680	40	1,312	1.73	2.16	1.30
PORTUGAL	61	6,154	157	12,013	1.12	1.01	1.23
SINGAPORE	394	1,343	60	2,606	1.36	1.50	1.24
SOUTH AFRICA	301	1,676	57	3,289	1.66	1.81	1.51
SPAIN	156	13,687	237	27,009	1.35	1.39	1.31
SWEDEN	306	3,490	45	6,941	1.89	2.28	1.50
SWITZERLAND	234	12,799	183	25,365	1.48	1.61	1.35
THAILAND	363	854	39	1,665	1.34	1.36	1.32
TURKEY	179	1,333	62	2,604	1.76	1.78	1.75
UK	1,501	5,512	27	11,008	1.93	2.32	1.54
USA	5,830	4,116	75	8,161	2.85	3.15	2.56
VENEZUELA	24	1,706	153	3,190	0.96	1.04	0.87

Table 1 (cont.)

Panel B: Summary statistics of q-ratios (across sample countries and years)

	q-ratio		
	all	small	large
# of obs.	492,856	246,401	246,455
Mean	1.97	2.26	1.68
Std. dev	3.67	4.45	2.63
Min	0.00	0.00	0.01
P1	0.33	0.25	0.49
Q1	0.91	0.86	0.94
Median	1.13	1.18	1.10
Q3	1.77	2.04	1.57
P99	15.64	19.83	10.92
Max	99.27	99.27	98.55

Table 2. Summary statistics of regression variables

This table reports summary statistics of the variables in the cross-section regression analysis. ***CSGOs***$_{all}$ is the country-specific growth opportunities (***CSGOs***) for all firms in a country and is measured by the absolute value of β_c in Eq.(1). Similarly, ***CSGOs***$_{small}$ and ***CSGOs***$_{large}$ are, respectively, the ***CSGOs*** of small and large firms in a country and are measured by the absolute values of $|\beta_{c,small}|$ and of $|\beta_{c,large}|$ in Eq.(2). ***CSGOs***$_{diff}$, computed as $|\beta_{c,small} - \beta_{c,large}|$, is a measure of difference in ***CSGOs*** between small and large firms in a country. *FinOpen* is our measure of a country's financial openness and is measured by the sum of the country's foreign assets and foreign liabilities, divided by its GDP. *Credit* is the ratio of domestic credit to private sector over GDP. *Stock* is the ratio of market capitalization of listed companies over GDP. *Tover* is the ratio the total value of shares traded over the average market capitalization. *GDP* is the natural log of GDP per capita. *GDPgrw* is the growth rate of GDP per capita. *TrdOpen* is the sum of imports and exports to GDP. *md*SIZE$_i$ is the median total assets (in log) for firm group i. *n*FIRMi is the number of firms (in log) for firm group i. *md*Qi and *std*Qi are, respectively, the median q-ratio and its cross-sectional standard deviation of firm group i (both in log). When the firm group is "diff", it refers to the difference in the corresponding variable between small and large firm groups. All variables are at annual frequencies and for a given country. The sample period is 1991-2012.

Panel A. Summary statistics of regression variables

Variable	N	Mean	Std Dev	Min	Median	Max
CSGOs$_{all}$	730	0.140	0.130	0.000	0.109	1.286
CSGOs$_{small}$	730	0.188	0.183	0.000	0.144	1.635
CSGOs$_{large}$	730	0.120	0.110	0.000	0.095	0.937
CSGOs$_{diff}$	730	0.155	0.141	0.000	0.113	1.352
FinOpen	730	1.805	2.674	0.044	1.023	28.971
Credit	713	0.939	0.549	0.088	0.957	2.321
Stock	728	0.706	0.545	0.010	0.558	3.289
Tover	727	0.742	0.610	0.002	0.604	4.974
GDP	730	9.520	1.193	6.018	9.986	11.509
GDPgrw	724	0.019	0.032	-0.117	0.020	0.162
TrdOpen	730	0.725	0.550	0.138	0.585	4.397
*md*SIZE$_{all}$	730	5.240	0.911	2.386	5.211	7.388
*n*FIRM$_{all}$	730	5.522	1.329	0.693	5.313	8.926
*md*Q$_{all}$	730	0.124	0.194	-0.582	0.099	1.513
*std*Q$_{all}$	730	0.199	0.868	-1.795	0.102	2.843
*md*SIZE$_{small}$	730	4.018	0.922	1.152	3.993	6.486
*n*FIRM$_{small}$	730	4.824	1.335	0.000	4.620	8.234
*md*Q$_{small}$	730	0.141	0.280	-0.758	0.117	1.916
*std*Q$_{small}$	729	0.337	0.951	-1.689	0.232	3.026
*md*SIZE$_{large}$	730	6.647	0.959	4.111	6.629	9.119
*n*FIRM$_{large}$	730	4.832	1.323	0.000	4.625	8.232
*md*Q$_{large}$	730	0.110	0.159	-0.444	0.087	1.193
*std*Q$_{large}$	729	-0.391	0.727	-2.441	-0.421	3.171
*md*SIZE$_{diff}$	730	-2.628	0.566	-4.146	-2.677	-0.908
*md*Q$_{diff}$	730	0.031	0.202	-0.735	0.025	1.479
*std*Q$_{diff}$	729	0.728	0.841	-3.190	0.660	4.481

Table 2 (cont.)

Panel B. Summary statistics – separately for country discounts and premiums

	when the signed ***CSGOs***$_{all}$ is negative ("country discount"; n=352)		when the signed ***CSGOs***$_{all}$ is positive ("country premium"; n=378)		p-value for difference in:	
	Mean	Median	Mean	Median	Mean	Median
CSGOs$_{all}$	0.147	0.119	0.134	0.102	(0.155)	(0.092)
CSGOs$_{small}$	0.204	0.164	0.174	0.126	(0.024)	(0.004)
CSGOs$_{large}$	0.118	0.099	0.121	0.091	(0.739)	(0.193)
CSGOs$_{diff}$	0.152	0.106	0.157	0.133	(0.596)	(0.126)

Table 3 Panel regressions of *CSGOs* on financial openness

This table presents the panel regression results of country-specific growth opportunities (***CSGOs***) in a country on the country's financial openness. The variables are defined in Table 2 caption. The subscript i in *md*SIZE$_i$, *n*FIRM$_i$, *md*Q$_i$, and *std*Q$_i$ corresponds to "all", "small", "large", or "diff". The sample period is from 1991 to 2012. Numbers in parentheses are the *p*-values that are adjusted by heteroscedasticity-consistent standard errors.

Panel A

	Dependent variable			
	CSGOs$_{all}$	***CSGOs***$_{small}$	***CSGOs***$_{large}$	***CSGOs***$_{diff}$
FinOpen	-0.004	-0.008	-0.005	-0.009
	(0.042)	(0.005)	(0.034)	(0.000)
Intercept	0.419	0.669	0.228	0.206
	(<.0001)	(<.0001)	(0.000)	(0.003)
Credit	-0.013	0.002	-0.009	0.010
	(0.311)	(0.896)	(0.349)	(0.441)
Stock	-0.013	-0.017	-0.010	-0.005
	(0.217)	(0.259)	(0.241)	(0.652)
Tover	-0.004	-0.039	0.026	-0.015
	(0.708)	(0.000)	(0.006)	(0.226)
GDP	-0.026	-0.027	-0.025	-0.005
	(<.0001)	(0.005)	(<.0001)	(0.381)
GDPgrw	-0.646	-0.358	-0.705	0.298
	(0.047)	(0.450)	(0.002)	(0.332)
TrdOpen	0.011	-0.020	0.041	-0.020
	(0.285)	(0.092)	(<.0001)	(0.045)
*md*SIZE$_i$	-0.002	-0.021	0.011	-0.044
	(0.710)	(0.036)	(0.053)	(0.000)
*n*FIRM$_i$	0.003	-0.010	0.008	-0.010
	(0.634)	(0.176)	(0.112)	(0.045)
*md*Q$_i$	0.222	0.169	0.220	-0.100
	(0.018)	(0.044)	(0.007)	(0.077)
*std*Q$_i$	-0.030	-0.052	0.014	-0.017
	(0.002)	(<.0001)	(0.229)	(0.009)
# of years	22	22	22	22
# of countries	39	39	39	39
R-squared	0.174	0.194	0.198	0.151
Year FE	YES	YES	YES	YES

Table 3 (cont.)

Panel B

	Dependent variable			
	CSGOs$_{all}$	***CSGOs***$_{small}$	***CSGOs***$_{large}$	***CSGOs***$_{diff}$
FinOpen (dummy for above median)	-0.102 (<.0001)	-0.126 (<.0001)	-0.089 (<.0001)	-0.045 (0.004)
Intercept	0.287 (<.0001)	0.502 (<.0001)	0.088 (0.154)	0.145 (0.042)
Credit	-0.017 (0.168)	-0.007 (0.702)	-0.016 (0.086)	-0.003 (0.803)
Stock	-0.006 (0.532)	-0.008 (0.568)	-0.002 (0.774)	-0.001 (0.903)
Tover	0.004 (0.684)	-0.030 (0.004)	0.032 (0.000)	-0.013 (0.329)
GDP	0.001 (0.851)	0.004 (0.720)	-0.001 (0.816)	0.002 (0.751)
GDPgrw	-0.700 (0.025)	-0.426 (0.359)	-0.743 (0.001)	0.273 (0.373)
TrdOpen	0.014 (0.122)	-0.019 (0.086)	0.043 (<.0001)	-0.030 (0.002)
*md*SIZE$_i$	-0.012 (0.073)	-0.032 (0.002)	0.006 (0.252)	-0.043 (<.0001)
*n*FIRM$_i$	-0.006 (0.294)	-0.018 (0.014)	0.002 (0.680)	-0.008 (0.110)
*md*Q$_i$	0.242 (0.005)	0.196 (0.015)	0.225 (0.002)	-0.085 (0.144)
*std*Q$_i$	-0.031 (0.001)	-0.057 (<.0001)	0.014 (0.168)	-0.018 (0.007)
# of years	22	22	22	22
# of countries	39	39	39	39
R-squared	0.239	0.242	0.266	0.149
Year FE	YES	YES	YES	YES

Table 3 (cont.)

Panel C

	Dependent variable			
	CSGOs$_{all}$	***CSGOs***$_{small}$	***CSGOs***$_{large}$	***CSGOs***$_{diff}$
FinOpen (dummy	-0.065	-0.077	-0.072	-0.069
for above q3)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
FinOpen (dummy	0.040	0.057	0.027	0.025
for below q1)	(0.056)	(0.058)	(0.068)	(0.209)
Intercept	0.252	0.447	0.066	0.069
	(0.002)	(<.0001)	(0.380)	(0.412)
Credit	-0.026	-0.017	-0.026	-0.012
	(0.042)	(0.336)	(0.009)	(0.339)
Stock	0.009	0.011	0.013	0.015
	(0.440)	(0.537)	(0.107)	(0.236)
Tover	-0.002	-0.038	0.029	-0.013
	(0.846)	(0.000)	(0.001)	(0.303)
GDP	-0.008	-0.005	-0.009	0.007
	(0.309)	(0.656)	(0.141)	(0.353)
GDPgrw	-0.722	-0.463	-0.769	0.226
	(0.031)	(0.350)	(0.001)	(0.472)
TrdOpen	0.020	-0.012	0.051	-0.017
	(0.044)	(0.328)	(<.0001)	(0.073)
*md*SIZE$_i$	-0.005	-0.024	0.011	-0.046
	(0.443)	(0.017)	(0.045)	(<.0001)
*n*FIRM$_i$	0.001	-0.010	0.007	-0.009
	(0.916)	(0.144)	(0.151)	(0.070)
*md*Q$_i$	0.221	0.173	0.215	-0.092
	(0.013)	(0.033)	(0.004)	(0.105)
*std*Q$_i$	-0.031	-0.056	0.013	-0.018
	(0.001)	(<.0001)	(0.244)	(0.007)
# of years	22	22	22	22
# of countries	39	39	39	39
R-squared	0.204	0.216	0.242	0.168
Year FE	YES	YES	YES	YES

Table 4 Panel regressions of changes in *CSGOs* on changes in financial openness

This table presents the panel regression results of changes in country-specific growth opportunities (***CSGOs***) in a country on changes in the country's financial openness. Unlike Table 3, this regression analysis employs the country fixed-effects (Panels A and B, respectively). The variables are defined in Table 2 caption and their first differences at annual frequencies are used. The subscript i in *md*SIZE$_i$, *n*FIRM$_i$, *md*Q$_i$, and *std*Q$_i$ corresponds to "all", "small", "large", or "diff". The sample period is from 1991 to 2012. Numbers in parentheses are the *p*-values that are adjusted by heteroscedasticity-consistent standard errors.

	Dependent variable			
	Δ*CSGOs*$_{all}$	**Δ*CSGOs*$_{small}$**	**Δ*CSGOs*$_{large}$**	**Δ*CSGOs*$_{diff}$**
Δ*FinOpen*	-0.028	-0.042	-0.013	-0.020
	(0.004)	(0.002)	(0.188)	(0.017)
Δ*Credit*	0.015	-0.007	0.004	-0.039
	(0.646)	(0.892)	(0.927)	(0.349)
Δ*Stock*	0.001	0.049	0.006	0.044
	(0.957)	(0.098)	(0.777)	(0.045)
Δ*Tover*	0.001	0.021	0.006	0.039
	(0.938)	(0.298)	(0.619)	(0.017)
Δ*GDP*	0.107	0.108	0.134	-0.053
	(0.159)	(0.234)	(0.015)	(0.404)
Δ*GDPgrw*	-0.576	-0.427	-0.464	-0.144
	(0.001)	(0.040)	(0.001)	(0.366)
Δ*TrdOpen*	0.126	0.145	0.134	-0.037
	(0.127)	(0.224)	(0.028)	(0.736)
Δ*md*SIZE$_i$	-0.016	-0.079	-0.070	-0.057
	(0.651)	(0.071)	(0.066)	(0.018)
Δ*n*FIRM$_i$	0.007	-0.066	-0.034	0.065
	(0.908)	(0.496)	(0.427)	(0.205)
Δ*md*Q$_i$	0.504	0.369	0.365	0.045
	(<.0001)	(0.000)	(<.0001)	(0.508)
Δ*std*Q$_i$	-0.010	-0.034	0.033	-0.017
	(0.285)	(0.007)	(0.083)	(0.094)
# of years	21	21	21	21
# of countries	39	39	39	39
R-squared	0.365	0.267	0.306	0.102
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES

Table 5 Summary statistics of industry-specific growth opportunities (*ISGOs*)

This table reports summary statistics of the industry-specific growth opportunities (***ISGOs***) that are re-computed for each country. To compute $\boldsymbol{ISGOs_{all}}$ for a country, in each year within a country, we first compute the fraction of its firms that belong to each of the industries in the country and then use those fractions as weights to compute the weighted average ***ISGOs*** (the γi estimates from Eq. (1)) within the country. For the ***ISGOs*** of small (i.e., $\boldsymbol{ISGOs_{small}}$) and large firms (i.e., $\boldsymbol{ISGOs_{large}}$) and their difference (i.e., $\boldsymbol{ISGOs_{diff}}$), we use the estimates of Eq. (2), namely, $\gamma_{i,small}$ and $\gamma_{i,large}$, and use as weights the fraction of small or large firms in each industry; we then take the weighted average of ***ISGOs***. See Section 4.1 for details. The sample period is 1991-2012.

Variable	N	Mean	Std Dev	Min	Median	Max
$\boldsymbol{ISGOs}_{all}$	730	0.154	0.042	0.067	0.149	0.387
$\boldsymbol{ISGOs}_{small}$	730	0.151	0.050	0.047	0.142	0.490
$\boldsymbol{ISGOs}_{large}$	730	0.174	0.041	0.081	0.168	0.356
$\boldsymbol{ISGOs}_{diff}$	730	0.080	0.017	0.035	0.080	0.139

Table 6 Panel regressions of *ISGOs* on financial openness

This table presents the panel regression results of industry-specific growth opportunities (***ISGOs***) in a country on the country's financial openness. $\boldsymbol{ISGOS}_{all}$, $\boldsymbol{ISGOS}_{small}$, $\boldsymbol{ISGOS}_{large}$, and $\boldsymbol{ISGOS}_{diff}$ are defined as in the caption of Table 5 and in Section 4.1. The subscript i in $md\text{SIZE}_i$, $n\text{FIRM}_i$, $md\text{Q}_i$, and $std\text{Q}_i$ corresponds to "all", "small", "large", or "diff". The independent variables are defined in the caption of Table 2. The sample period is fro m1991 to 2012. Numbers in parentheses are the *p*-values that are adjusted by heteroscedasticity-consistent standard errors.

Panel A

	Dependent variable			
	$\boldsymbol{ISGOS}_{all}$	$\boldsymbol{ISGOS}_{small}$	$\boldsymbol{ISGOS}_{large}$	$\boldsymbol{ISGOS}_{diff}$
FinOpen	0.001	0.002	-0.001	0.000
	(0.027)	(0.010)	(0.000)	(0.132)
Intercept	0.112	0.078	0.129	0.057
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Credit	-0.007	-0.011	-0.004	-0.003
	(0.003)	(0.000)	(0.249)	(0.008)
Stock	0.008	0.009	0.006	0.002
	(<.0001)	(0.001)	(0.004)	(0.035)
Tover	0.003	0.006	0.001	0.000
	(0.047)	(0.001)	(0.543)	(0.667)
GDP	0.004	0.004	-0.001	0.001
	(0.000)	(0.006)	(0.375)	(0.016)
GDPgrw	0.019	0.038	-0.030	0.061
	(0.603)	(0.446)	(0.618)	(0.005)
TrdOpen	-0.013	-0.011	-0.010	-0.006
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
$md\text{SIZE}_i$	-0.004	-0.004	0.011	-0.004
	(0.011)	(0.002)	(<.0001)	(0.001)
$n\text{FIRM}_i$	0.000	0.006	-0.005	0.001
	(0.845)	(<.0001)	(0.001)	(0.280)
$md\text{Q}_i$	-0.009	0.009	-0.045	-0.011
	(0.271)	(0.315)	(<.0001)	(0.001)
$std\text{Q}_i$	0.004	0.003	0.014	0.001
	(0.012)	(0.164)	(<.0001)	(0.025)
# of years	22	22	22	22
# of countries	39	39	39	39
R-squared	0.713	0.640	0.574	0.424
Year FE	YES	YES	YES	YES

Table 6 (cont.)

Panel B

	Dependent variable			
	ISGOs$_{all}$	***ISGOs***$_{small}$	***ISGOs***$_{large}$	***ISGOs***$_{diff}$
FinOpen (dummy for above median)	0.007	0.014	-0.001	0.001
	(0.005)	(0.001)	(0.836)	(0.340)
Intercept	0.121	0.097	0.130	0.060
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Credit	-0.005	-0.007	-0.006	-0.004
	(0.029)	(0.014)	(0.049)	(0.002)
Stock	0.008	0.008	0.007	0.002
	(<.0001)	(0.005)	(0.001)	(0.041)
Tover	0.002	0.005	0.002	0.000
	(0.110)	(0.006)	(0.398)	(0.749)
GDP	0.002	0.001	-0.002	0.001
	(0.066)	(0.565)	(0.277)	(0.114)
GDPgrw	0.017	0.042	-0.023	0.062
	(0.621)	(0.398)	(0.708)	(0.005)
TrdOpen	-0.012	-0.009	-0.013	-0.007
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
*md*SIZE$_i$	-0.003	-0.004	0.011	-0.003
	(0.033)	(0.011)	(<.0001)	(0.006)
*n*FIRM$_i$	0.000	0.005	-0.004	0.001
	(0.939)	(<.0001)	(0.008)	(0.110)
*md*Q$_i$	-0.010	0.007	-0.047	-0.012
	(0.222)	(0.454)	(<.0001)	(0.000)
*std*Q$_i$	0.005	0.004	0.013	0.001
	(0.002)	(0.044)	(<.0001)	(0.020)
# of years	22	22	22	22
# of countries	39	39	39	39
R-squared	0.712	0.641	0.569	0.424
Year FE	YES	YES	YES	YES

Table 6 (cont.)

Panel C

	Dependent variable			
	ISGOs$_{all}$	***ISGOs***$_{small}$	***ISGOs***$_{large}$	***ISGOs***$_{diff}$
FinOpen (dummy	0.007	0.017	-0.003	-0.002
for above q3)	(0.003)	<.0001	(0.198)	(0.135)
FinOpen (dummy	0.003	-0.008	0.018	0.002
for below q1)	(0.288)	(0.042)	(<.0001)	(0.339)
Intercept	0.113	0.117	0.085	0.050
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Credit	-0.004	-0.005	-0.006	-0.004
	(0.127)	(0.087)	(0.067)	(0.001)
Stock	0.007	0.004	0.010	0.003
	(0.000)	(0.185)	(<.0001)	(0.006)
Tover	0.002	0.005	0.001	0.000
	(0.107)	(0.003)	(0.649)	(0.630)
GDP	0.004	0.000	0.003	0.002
	(0.003)	(0.954)	(0.099)	(0.005)
GDPgrw	0.016	0.054	-0.043	0.058
	(0.665)	(0.287)	(0.505)	(0.008)
TrdOpen	-0.013	-0.012	-0.011	-0.006
	(<.0001)	(<.0001)	(<.0001)	(<.0001)
*md*SIZE$_i$	-0.004	-0.004	0.010	-0.004
	(0.012)	(0.003)	(<.0001)	(0.001)
*n*FIRM$_i$	-0.001	0.005	-0.004	0.001
	(0.570)	(<.0001)	(0.001)	(0.258)
*md*Q$_i$	-0.009	0.009	-0.051	-0.010
	(0.271)	(0.328)	(<.0001)	(0.001)
*std*Q$_i$	0.005	0.004	0.014	0.001
	(0.003)	(0.054)	(<.0001)	(0.030)
# of years	22	22	22	22
# of countries	39	39	39	39
R-squared	0.713	0.647	0.587	0.426
Year FE	YES	YES	YES	YES

Table 7 Panel regressions of changes in *ISGOs* on changes in financial openness

This table presents the panel regression results of changes in industry-specific growth opportunities (***ISGOs***) in a country on changes in the country's financial openness. Unlike Table 6, this regression analysis employs the country fixed-effects, with or without the year fixed-effects (Panels A and B, respectively). $\boldsymbol{ISGOS}_{all}$, $\boldsymbol{ISGOS}_{small}$, $\boldsymbol{ISGOS}_{large}$, and $\boldsymbol{ISGOS}_{diff}$ are defined as in the caption of Table 5 and in Section 4.1. The independent variables are defined in the caption of Table 2. The sample period is from 1991 to 2012. Numbers in parentheses are p-values adjusted by heteroscedasticity-consistent standard errors.

	Dependent variable			
	$\Delta\boldsymbol{ISGOs}_{all}$	$\Delta\boldsymbol{ISGOs}_{small}$	$\Delta\boldsymbol{ISGOs}_{large}$	$\Delta\boldsymbol{ISGOs}_{diff}$
Δ*FinOpen*	0.004	0.006	-0.001	-0.003
	(0.037)	(0.014)	(0.819)	(0.051)
Δ*Credit*	0.008	0.004	0.009	0.001
	(0.396)	(0.793)	(0.358)	(0.845)
Δ*Stock*	0.004	0.006	0.001	0.002
	(0.529)	(0.335)	(0.767)	(0.422)
Δ*Tover*	-0.003	-0.005	-0.001	0.003
	(0.097)	(0.143)	(0.585)	(0.123)
Δ*GDP*	-0.003	0.004	-0.014	-0.009
	(0.788)	(0.792)	(0.137)	(0.189)
Δ*GDPgrw*	-0.015	-0.033	-0.003	0.015
	(0.515)	(0.377)	(0.905)	(0.452)
Δ*TrdOpen*	0.013	0.020	0.014	0.004
	(0.466)	(0.330)	(0.212)	(0.647)
Δ*md*SIZE$_i$	0.006	0.004	0.014	-0.006
	(0.248)	(0.479)	(0.001)	(0.047)
Δ*n*FIRM$_i$	0.016	0.026	0.015	0.004
	(0.166)	(0.180)	(0.100)	(0.540)
Δ*md*Q$_i$	0.000	0.012	-0.012	-0.001
	(0.960)	(0.220)	(0.158)	(0.882)
Δ*std*Q$_i$	0.003	0.002	0.005	-0.001
	(0.008)	(0.278)	(0.002)	(0.090)
# of years	21	21	21	21
# of countries	39	39	39	39
R-squared	0.851	0.717	0.821	0.424
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES

Table 8 Panel regressions of changes in *CSGOs (ISGOs*) on changes in VIX

This table presents the panel regression results of changes in industry-specific growth opportunities (***ISGOs***) in a country on changes in VIX index along with other regressors including the changes in the country's financial openness. This regression analysis employs the country fixed-effects only without the year fixed-effects. All variables are the same as those in Table 7, except *negVIX*, which is the negative value of the average VIX during a year. Its annual change is denoted by Δ*negVIX* in the table. The sample period is from 1991 to 2012. Numbers in parentheses are the *p*-values that are adjusted by heteroscedasticity-consistent standard errors.

	Δ*CSGOs*$_{small}$	**Δ*ISGOs*$_{small}$**	**Δ*CSGOs*$_{large}$**	**Δ*ISGOs*$_{large}$**	**Δ*CSGOs*$_{diff}$**	**Δ*ISGOs*$_{diff}$**
Δ*FinOpen*	-0.039	0.006	-0.017	0.002	-0.019	-0.002
	(0.011)	(0.115)	(0.088)	(0.329)	(0.012)	(0.029)
Δ*negVIX*	-0.129	0.213	-0.297	0.219	0.055	0.040
	(0.343)	<.0001	(0.001)	<.0001	(0.495)	(0.000)
Intercept	0.022	-0.008	0.003	0.008	0.012	0.002
	(0.684)	(0.420)	(0.964)	(0.365)	(0.774)	(0.705)
Δ*Credit*	-0.014	-0.008	-0.001	0.013	-0.041	0.003
	(0.773)	(0.776)	(0.983)	(0.305)	(0.264)	(0.575)
Δ*Stock*	0.072	0.033	-0.005	0.025	0.051	0.005
	(0.009)	(0.000)	(0.816)	<.0001	(0.006)	(0.027)
Δ*Tover*	0.012	-0.014	-0.004	-0.003	0.036	0.002
	(0.495)	(0.005)	(0.760)	(0.335)	(0.013)	(0.148)
Δ*GDP*	0.060	0.037	0.067	0.014	-0.048	-0.018
	(0.396)	(0.014)	(0.152)	(0.160)	(0.208)	<.0001
Δ*GDPgrw*	-0.476	-0.050	-0.351	-0.002	-0.185	0.043
	(0.010)	(0.271)	(0.005)	(0.950)	(0.186)	(0.013)
Δ*TrdOpen*	0.050	-0.034	0.107	0.014	-0.072	-0.002
	(0.545)	(0.158)	(0.039)	(0.306)	(0.304)	(0.682)
Δ*md*SIZE$_i$	-0.075	0.003	-0.064	0.013	-0.057	-0.005
	(0.053)	(0.693)	(0.102)	(0.058)	(0.012)	(0.090)
Δ*n*FIRM$_i$	-0.042	0.030	-0.059	0.039	0.064	0.008
	(0.646)	(0.186)	(0.182)	(0.005)	(0.155)	(0.092)
Δ*md*Q$_i$	0.342	0.009	0.324	0.005	0.046	-0.002
	(0.001)	(0.337)	(0.000)	(0.622)	(0.508)	(0.620)
Δ*std*Q$_i$	-0.024	0.012	0.038	0.017	-0.015	-0.001
	(0.067)	<.0001	(0.027)	<.0001	(0.134)	(0.110)
# of years	21	21	21	21	21	21
# of countries	39	39	39	39	39	39
R-squared	0.227	0.325	0.254	0.490	0.089	0.107
Year FE	NO	NO	NO	NO	NO	NO
Country FE	YES	YES	YES	YES	YES	YES

Table 9 Investment-q regressions with decomposed q-ratios

This table presents the panel regression results of corporate investment rate on the decomposed q-ratios, cashflow, and firm size. All variables are de-meaned by the firm's own average and the year-by-year (within a country) mean value. The decomposition is conducted by Eq. (2). The investment rate, cashflow, and firm size variables are also truncated at the 1st and 99th percentiles. The sample period is from 1991 to 2012. Numbers in parentheses are the *p*-values that are adjusted by heteroscedasticity-consistent standard errors.

	Dependent variable: (Total assets$_t$ – total assets$_{t-1}$) / total assets$_{t-1}$									
	Model (1) (full sample)		Model (2) (full sample)		Model (2) (sub-sample: D_{open}=0)		Model (2) (sub-sample: D_{open}=1)		Model (3) (full sample)	
	Coeff	(p-val)	Coeff	(p-val)	Coeff	(p-val)	Coeff	(p-val)	Coeff	(p-val)
Intercept	-0.547	(<.0001)	-0.502	(<.0001)	-0.528	(<.0001)	-0.479	(<.0001)	-0.528	(<.0001)
D_{small}			-0.125	(<.0001)	-0.095	(<.0001)	-0.154	(<.0001)	-0.095	(<.0001)
D_{open}									0.049	(0.023)
D_{small}*D_{open}									-0.058	(0.053)
*G*q	0.154	(<.0001)	0.271	(<.0001)	0.236	(<.0001)	0.294	(<.0001)	0.236	(<.0001)
*G*q*D_{small}			-0.190	(0.000)	-0.161	(0.024)	-0.210	(0.002)	-0.161	(0.024)
*G*q*D_{open}									0.058	(0.444)
*G*q*D_{small}*D_{open}									-0.049	(0.620)
*C*q	0.148	(<.0001)	0.150	(<.0001)	0.137	(<.0001)	0.163	(<.0001)	0.137	(<.0001)
*C*q*D_{small}			0.015	(0.006)	0.039	(<.0001)	-0.006	(0.450)	0.039	(<.0001)
*C*q*D_{open}									0.026	(0.002)
*C*q*D_{small}*D_{open}									-0.045	(<.0001)
*I*q	0.188	(<.0001)	0.231	(<.0001)	0.239	(<.0001)	0.223	(<.0001)	0.239	(<.0001)
*I*q*D_{small}			-0.078	(<.0001)	-0.105	(<.0001)	-0.052	(0.001)	-0.105	(<.0001)
*I*q*D_{open}									-0.016	(0.321)
*I*q*D_{small}*D_{open}									0.053	(0.022)
*F*q	0.133	(<.0001)	0.160	(<.0001)	0.175	(<.0001)	0.145	(<.0001)	0.175	(<.0001)
*F*q*D_{small}			-0.045	(<.0001)	-0.055	(<.0001)	-0.036	(<.0001)	-0.055	(<.0001)
*F*q*D_{open}									-0.030	(<.0001)
*F*q*D_{small}*D_{open}									0.019	(0.034)

cf	0.558	(<.0001)	0.759	(<.0001)	0.726	(<.0001)	0.798	(<.0001)	0.726	(<.0001)
$cf*D_{small}$			-0.305	(<.0001)	-0.294	(<.0001)	-0.322	(<.0001)	-0.294	(<.0001)
$cf*D_{open}$									0.071	(0.028)
$cf*D_{small}*D_{open}$									-0.028	(0.465)
sz	-0.095	(<.0001)	-0.097	(<.0001)	-0.100	(<.0001)	-0.093	(<.0001)	-0.100	(<.0001)
D_{small}			-0.005	(0.000)	-0.001	(0.685)	-0.010	(<.0001)	-0.001	(0.685)
$sz*D_{open}$									0.007	(<.0001)
$sz*D_{small}*D_{open}$									-0.009	(0.002)
Adj R^2	0.128		0.134		0.134		0.135		0.135	
# obs.	377,316		377,316		181,448		195,868		377,316	

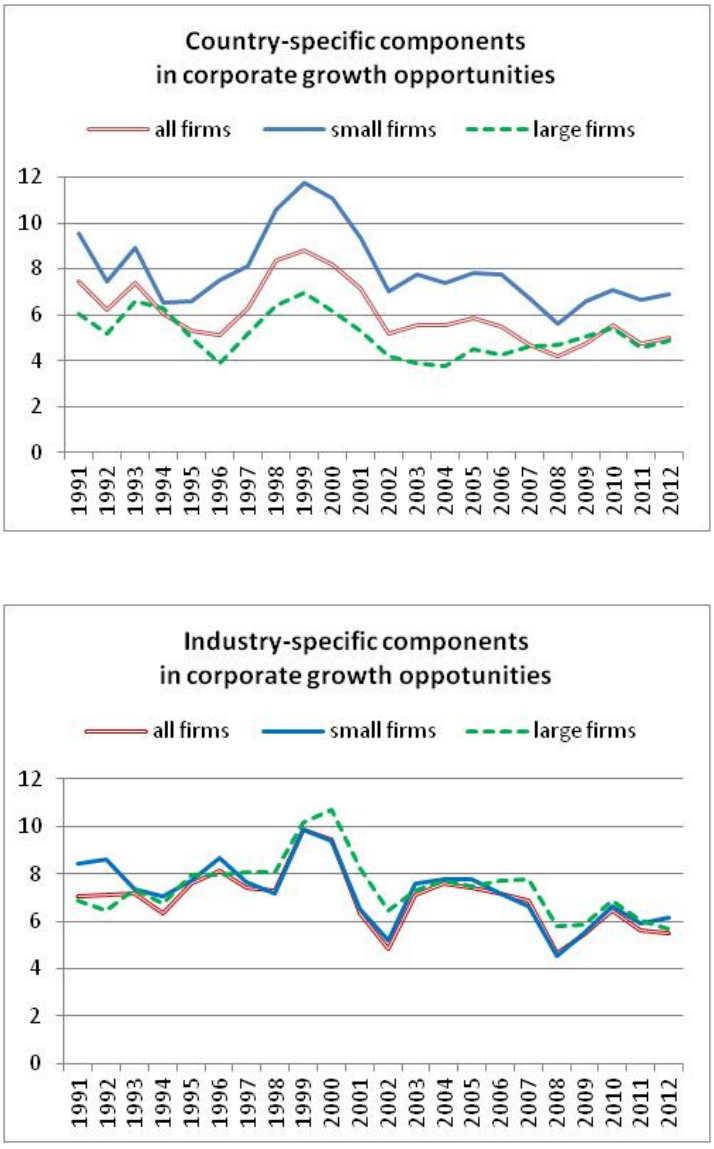

Figure 1. Country- and industry-specific components in corporate growth opportunities

Small and large firms are defined each year within a country by the median asset size. The country-specific growth opportunities (top panel) are the sum across 40 sample countries, while the industry-specific growth opportunities (bottom panel) are the sum across 47 sample industries. The sample period is from 1991 to 2012.

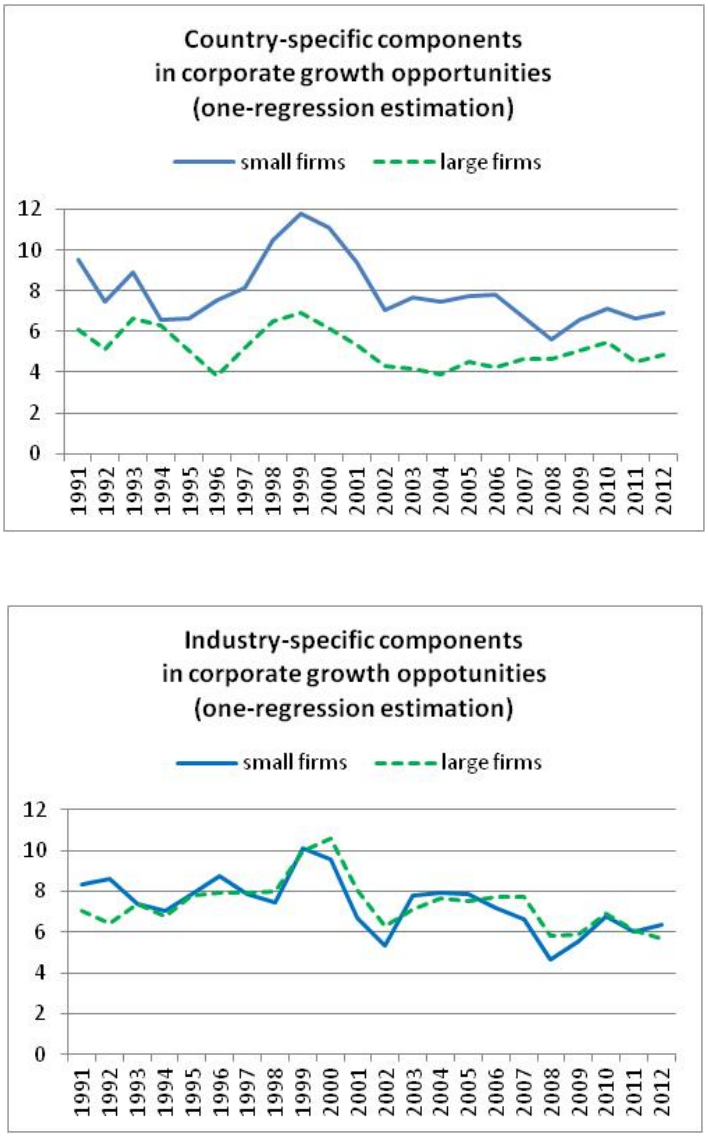

Figure 2. Country- and industry-specific components in corporate growth opportunities: Estimated by one regression

Small and large firms are defined each year within a country by the median asset size. The country-specific growth opportunities (top panel) are the sum across 40 sample countries, while the industry-specific growth opportunities (bottom panel) are the sum across 47 sample industries. The sample period is from 1991 to 2012.