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Capital market financing and firm growth

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ABSTRACT

This paper studies whether there is a connection between finance and growth at the firm level. It employs a new dataset of 150,165 equity and bond issuances around the world, matched with income and balance sheet data for 62,653 listed firms in 65 countries over 1990–2016. Three main patterns emerge from the analyses. First, firms that choose to issue in capital markets use the funds raised to grow by enhancing their productive capabilities, increasing their tangible and intangible capital and the number of employees. Growth accelerates as firms raise funds. Second, the faster growth is more pronounced among firms that are more likely to face tighter financing constraints, namely, small, young, and high-R&D firms. Third, capital market issuances are associated with faster growth among firms located in countries with more developed capital markets relative to banks. Capital markets are also comparatively effective at allowing financially constrained firms to raise capital.

1. Introduction

A large body of research finds a positive connection between capital market development and national growth rates (Levine and Zervos, 1996, 1998; Demirguc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998; Henry, 2000; Levine,

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2002; Beck and Levine, 2004; Bekaert et al., 2005). This macro-level work, however, does not necessarily imply that firms use the funds raised in these markets to increase their productive capabilities—human capital, physical capital, and intangible capital—and grow. Firms have access to multiple sources to finance their growth, including bank credit and internal finance. Moreover, capital markets can foster aggregate growth indirectly, by facilitating risk diversification, enhancing information dissemination, and boosting savings, without necessarily being the conduits of capital-augmenting funds for corporations (Levine, 1991, 2005; Holmström and Tirole, 1993; Obstfeld, 1994; Acemoglu and Zilibotti, 1997; Aghion et al., 2018).

We use firm-level analyses to assess the relationship between firms issuing securities and changes in their productive capabilities and overall growth rates. We examine how firms that issue equity and bonds grow before, during, and after they raise new capital compared to firms that do not issue securities. We examine both overall firm growth, as measured by sales and assets, and growth in productive capabilities, as measured by human capital, physical capital, and intangible capital. Furthermore, we complement an extensive literature that suggests that the relationship between securities issuances and firm growth might depend on (a) whether firms are issuing equity or bonds, (b) the severity of financing constraints on firms, and (c) the extent to which firms are issuing securities in more market-based or more bank-based financial systems. We do so by studying how the relationship between issuing securities and growth varies across each of these dimensions.

To conduct the study, we assemble a comprehensive dataset of 150,165 firm-level issuances of equities and bonds in domestic and international markets over the period 1991–2016. We match this transaction-level information with firm-level income statements and balance sheet data on 62,653 publicly listed firms from 65 countries. Our matched dataset includes both publicly listed firms that issued equities and bonds during our sample period and those that did not issue securities during this period. We employ a difference-in-differences empirical strategy around capital market issuances to assess the connections between firms issuing equities and bonds, firm investment in productive capabilities, and firm growth. Our analyses control for time-variant firm-level characteristics as well as for firm and country-year fixed effects.

We find, first, that compared to non-issuers, firms choosing to issue securities grow faster and boost their productive capabilities (employees, tangible capital, and intangible capital). Issuers grow faster than non-issuers before the issuance of securities, and this growth differential significantly widens as firms issue securities. Furthermore, the increase in growth rates associated with equity issuances is larger than those associated with bond issuances. These findings suggest that firms use the funds raised in securities markets to realize growth opportunities.

Second, we find that the relationship between firm growth and securities issuances is larger among firms with tighter financing constraints, for which the marginal returns to increasing human, tangible, and intangible capital are likely to be greater. To conduct this examination, we need a measure of the degree to which firms are financially constrained. We follow an extensive literature that finds that smaller, younger, and more innovative firms tend to be more informationally opaque and have fewer tangible assets to offer as collateral, which create higher barriers to such firms raising external finance. We thus use firm size, age, and R&D (research and development) expenditures as proxies of financial constraints. We discover that the surge in sales, employment, and investment growth when firms issue securities is more pronounced among smaller, younger, and higher-R&D firms.

Third, we find that equity (but not bond) issuances are associated with rapid expansions of the productive capabilities of high-R&D firms, especially in terms of intangible assets. This finding, based on a large panel of firms worldwide, complements previous empirical studies for the U.S. and developed European countries that suggest that equity issuances are the most effective way of financing the growth of innovative firms, because equity holders enjoy fully the upside benefits of successful innovations (Da Rin et al., 2006; Brown and Petersen, 2009; Brown and Floros, 2012; Wu and Au Yeung, 2012).

Fourth, we find that firms issuing securities in countries with comparatively well-developed capital markets experience a larger increase in their sales and productive capabilities than their counterparts in more bank-based financial systems. This finding suggests that the level of development of capital markets is linked to how firms perform after issuing securities in those markets. By covering a larger sample of countries and a more recent time period, our result adds new evidence to research stressing that market-based financial systems are comparatively more effective than bank-based financial systems at supporting firms exploit growth opportunities, especially small, young, and innovative firms that typically grow fast (Brown et al., 2009, 2013, 2017). We find that these firms are more prevalent in market-based economies.

Fifth, we examine how firms respond to exogenous changes in growth opportunities. One concern with the analyses thus far is that documenting growth-issuance patterns using a difference-in-differences specification does not fully address endogeneity considerations. It is unclear whether changes in the supply of capital foster security issuances and firm growth, whether changes in growth opportunities encourage the issuance of securities to boost productive capabilities and realize those opportunities, or whether other factors are driving firm growth, issuance decisions, and capital market development. To shed light on this issue, we examine variations in the price of mining commodities and assess how firms in mining industries around the world respond in terms of issuing equities and bonds. Besides controlling for country and industry fixed effects, these analyses condition on time-varying economic and financial indicators. We find that mining firms experiencing higher commodity prices are much more likely to issue equity and bonds than other firms. This finding suggests that capital market issuances are a mechanism through which firms build productive capabilities to realize expected growth opportunities that come about at the aggregate level.

Our research contributes to several strands of research beyond the macro-level finance and growth literature discussed above. First, several papers analyze how firms use the proceeds from capital market issuances. Firms can use the newly raised funds to alter their liabilities, including changing debt-equity ratios, replacing more expensive financing with cheaper funding, minimizing taxes, or changing their debt maturity (Pagano et al., 1998; De Angelo et al., 2010; Hertzel and Li, 2010;

Makan and Demos, 2012; Shin and Zhao, 2013; Alden, 2014; Bass and Smith, 2018; Fan, 2019). Firms can also use the funds raised through securities issuances to accumulate cash or other financial assets, but not necessarily to directly increase human, physical, and intangible capital (Baker and Wurgler, 2002; De Angelo et al., 2010; McLean, 2011; Bruno and Shin, 2017; McLean and Zhao, 2018; Calomiris et al., 2019). This research, however, tends to be silent on the use of capital markets to fund corporate investments in physical and intangible capital, except for a couple of cases (Kim and Weisbach, 2008; Calomiris et al., 2021). Our study contributes to these earlier studies by (a) examining how firms use the proceeds raised through different types of securities, namely equity and corporate bonds, (b) exploring the heterogeneous changes in assets, sales, and productive capabilities associated with securities issuances across firms facing different financing constraints, financial architectures, and growth prospects, (c) benchmarking the expansion of issuers with that of non-issuers, as it could be the case that all firms are growing and expanding their productive capabilities simultaneously for omitted reasons, and (d) studying changes in growth during and after the issuance year relative to the pre-issuance period.

Second, extensive research suggests that smaller, younger, and more innovative firms face tighter financing constraints, creating an environment in which the returns to finance are greater among such firms. Smaller and younger firms are often more informationally opaque and generally have less collateral than larger, more established firms (Carpenter and Petersen, 2002; Beck et al., 2005, 2008; Beck and Demirguc-Kunt, 2006; Oliveira and Fortunato, 2006; Carreira and Silva, 2010; Hadlock and Pierce, 2010; Erel et al., 2015).[2] Financial intermediaries and markets often find it difficult to evaluate novel activities and typically do not accept as collateral the types of intangible capital that compose a large part of the capital stock of innovative firms (Himmelberg and Petersen, 1994; Hall, 2002; Bougheas et al., 2003; Brown et al., 2009; Hall and Lerner, 2010; Czarnitzki and Hottenrott, 2011).[3] As a result, smaller and younger firms might need to rely more on internal financing (rather than on issuing securities and receiving loans), arguably constraining their ability to undertake profitable investment opportunities (Chittenden et al., 1996; Rahaman, 2011).[4] We contribute to this literature by showing that, when they actually issue securities in capital markets, firms that are more likely to face tighter financing constraints (smaller, younger, and higher R&D firms) grow faster than other firms. This evidence suggests that capital markets allow firms to relax their capital constraints and better realize growth opportunities.

Third, research also suggests that the growth-issuance relation among innovative firms should depend on whether firms issue equity or debt (Brown and Petersen, 2009; Brown and Floros, 2012; Wu and Au Yeung, 2012). This work holds that equity finance is better suited for funding innovative, riskier firms because equity holders directly benefit when the firm succeeds, and equity contracts do not accentuate problems of financial distress for firms. In contrast, debt holders are comparatively wary of these firms, as they focus less on the right-hand tail of the return distribution and more on default probabilities, collateral, and cash flows. Consistent with this view, empirical research finds that more developed equity (but not credit) markets support faster growth of innovative-intensive industries, mostly through higher productivity growth rather than fixed capital accumulation (Brown et al., 2013, 2017; Hsu et al., 2014). Industry-level studies, however, do not necessarily document a direct link between issuing securities and boosting productive capabilities. Moreover, existing work focuses on equity versus credit, not on the issuance of bonds. We (a) conduct the analyses at the firm-level and (b) differentiate between equity and bond issuances and discover that the relationship between securities issuances and the growth of productive capabilities, especially intangible capital, is more pronounced among innovative firms issuing equity rather than bonds.

Fourth, we build on several strands of the literature suggesting that financial architecture (the comparative development of capital markets and banks) plays a role in the finance-growth nexus.[5] The emerging literature on financial development, innovation, and technology-led growth implies that countries with market-based financial systems are better positioned than their bank-based counterparts to finance innovative activity, particularly for smaller and younger firms more dependent on external finance (Brown et al., 2009, 2013, 2017). The evidence in these studies suggests that a country's financial architecture might shape which types of firms obtain financing, thereby affecting the composition of firms. We show that countries with more market-based financial systems have (a) smaller, younger, and more innovative firms and (b) firms issuing securities in these countries grow faster relative to firms in countries with more bank-based systems.

Fifth, to understand how exogenous factors can affect firm financing, researchers have analyzed how changes in international commodity prices affect (a) financing through the banking sector (Agarwal et al., 2017, 2020) and (b) aggregate investment and business cycles (Caputo and Irarrazabal, 2017; Fernández et al., 2017; Drechsel and Tenreyro, 2018; Valdes, 2018).

[2] Although publicly listed firms are subject to financial reporting and disclosure, more information is generated and analyzed for larger than for smaller firms, which affects issuance decisions (Atiase, 1985; Collins et al., 1987; Bhushan, 1989; Chang et al., 2006).

[3] In line with this argument, financially constrained firms benefit the most from investing in tangible assets because those assets help relax constraints, allowing for further investment (Campello and Hackbarth, 2012).

[4] Acquisitions can relieve financial constraints in target firms, especially when the target firm is relatively small (Erel et al., 2015), and cash inflows from fixed assets sales can boost corporate R&D investment (Borisova and Brown, 2013).

[5] A large literature is inconclusive regarding the effects of financial architecture in promoting economic growth. Early research argues that it is the overall level of financial development that matters for economic success, but not financial structure per se (Arestis et al., 2001; Beck and Levine, 2002; Demirguc-Kunt and Maksimovic, 2002; Levine, 2002; Demirguc-Kunt and Levine, 2004; Levine, 2005; Ndikumana, 2005; Chakraborty and Ray, 2006; Popov, 2018). Other studies suggest non-linearities in this relation (Boyd and Smith, 1998; Levine, 2002; Tadesse, 2002; Cihak and Demirguc-Kunt, 2012; Demirguc-Kunt et al., 2013; Luintel et al., 2016; Seven and Yetkiner, 2016). A different line of research studies how firms in civil law (bank-based) and common law (market-based) countries use equity markets to finance their investments (La Porta et al., 1997; Kim and Weisbach, 2008) and why firms cross-list their securities in international markets with other financial structures (Karolyi, 2006; Claessens and Schmukler, 2007; Gozzi et al., 2008; 2010).

We expand on this literature by studying how changes in prices in the mining industry, as a proxy for exogenous shocks to the value of production, can lead firms to also issue securities in capital markets. Our findings suggest that at least part of the relationship between finance and growth might be driven by opportunities that arise at the industry level, beyond idiosyncratic shocks to firm growth opportunities, which are difficult to observe for the econometrician. Firms seem to realize those aggregate opportunities by tapping financing in capital markets, which could explain some of the aggregate effects on investment documented in the literature.

The remainder of the paper is organized as follows. Section 2 describes the data. Section 3 describes the findings on the relationship between capital market financing and firm performance around issuance activity. Section 4 shows the heterogeneity of the results across firms. Section 5 describes the heterogeneity across countries. Section 6 explores the role of exogenous growth opportunities in the likelihood of firms to issue securities in capital markets. Section 7 concludes.

2. Data

2.1. Data construction

The data on firm capital raising activity cover the period 1991–2016 and come from the Refinitiv's Security Data Corporation (SDC) Platinum database. This database provides transaction-level information on new capital-raising issuances of common and preferred equity and publicly and privately placed bonds in capital markets around the world.[6] Given that the SDC Platinum database does not collect data on debt issuances with maturities shorter than one year, the dataset does not cover commercial paper.

To examine the comparative performance of issuing and non-issuing firms, we combine the data on equity and bond issuances with data on income and balance sheets for publicly listed companies from the Worldscope database, which is designed to provide comparable corporate financial data across countries, industries, and time. We match equity and corporate bond issuance data with firm income and balance sheet data using the CUSIP identifier. If the matching proves unsuccessful, we use the following identifiers: SEDOL, ISIN, and Thomson Reuters Permanent Identifier.[7] For the majority of countries in our matched sample, we have both capital market issuance and income and balance sheet data on at least 70 percent of the listed firms in each country, where data on the total number of listed firms per country come from the World Federation of Exchanges database.

Worldscope provides data at the consolidated level for listed companies with subsidiaries. For those parent companies, we aggregate the issuance activity of the parent and the related (listed and non-listed) subsidiaries to make issuance data consistent with the level of aggregation of the income and balance sheet data. Listed subsidiaries with income and balance sheet data are considered as separate firms with their own matching issuance activity. Our final sample includes separately both listed parent firms and listed subsidiaries, in addition to the many other firms that are not part of conglomerates. To make sure that our results are not affected by the inclusion of parent firms, we repeated the analysis by excluding parent firms that have subsidiaries with issuance activity in capital markets over the 1991–2016 period. Our main findings are robust to this change, implying that firm performance around issuance is not driven by the capital raised through subsidiaries. This is not surprising because the number of issuances through subsidiaries is 14,725 (less than 10 percent of the total) and the number of firms with issuing subsidiaries is 4232 (less than 7 percent of the total).

We exclude all firms with a primary industry classification in the financial sector (SIC codes 6000–6799) or the public sector (SIC codes 9100–9999). Moreover, we exclude countries with less than 10 firms issuing in capital markets between 1991 and 2016 as well as offshore financial centers.[8] Firm-level attributes (total assets, sales, tangible fixed assets, intangible assets, and R&D expenditures) are all measured in logs in constant 2011 U.S. dollars (except for the number of employees, which is just measured in logs). Their growth rates are thus calculated as the difference in logs. All data on firm-level attributes are winsorized by country at the 1 percent level.

Our final matched dataset comprises 62,653 firms from 65 countries, of which 45,306 issued equity and/or bonds at least once during the sample period (Appendix Table 1). We examine 150,165 issuance events: 102,161 equity issuances, 38,487 corporate bond issuances, and 9517 mixed issuances (when a firm issues equity and bonds in the same year). By excluding unlisted firms, the sample leaves out firms that are (a) relatively small and sometimes informal and (b) likely to have different accounting standards.

For the analysis on country heterogeneity in Section 5, we use country-level data on economic, bank, and capital market development from the World Development Indicators database and the Financial Structure and Development database. Appendix Table 2 provides detailed definitions of the firm- and country-level variables.

The results reported throughout this paper are robust to several alternative sampling approaches. First, the results hold: (a) when excluding China or the United States, which together account for about 40 percent of world GDP; or (b) when simultaneously excluding Canada, Japan, and the United Kingdom, which together account for the largest number of

[6] SDC Platinum collects data on capital raising issuance mostly from filings with local regulatory agencies and stock exchanges, complementing this information with data from other sources such as offering circulars, prospectuses, surveys of investment banks, brokers, and other financial advisors, news sources, trade publications, and wires.

[7] This matching algorithm allows us to match 87 percent of the equity issuances and 70 percent of the corporate bond issuances reported in SDC Platinum.

[8] The list of offshore centers is based on the IMF report "Offshore Financial Centers (OFCs): IMF Staff Assessments."

Table 1
Summary statistics. This table reports summary statistics characterizing firms' issuance activity (Panel A) and their growth rates (Panel B) over three different periods. The reported firm-level statistics are the median across countries of the median firm per country. For each firm, statistics are first calculated as simple averages over the sample period. The frequency of issuance is calculated as the number of years in which a firm had capital market issuances in a given period over the total number of years that the firm was alive in that period. Issuing firms are those with at least one capital raising issuance within the period analyzed. The table also shows average GDP growth for the median country in the sample.

A. Issuance Activity			
	1991–1999	*2000–2007*	*2009–2016*
Total Number of Issuing Firms	15,436	21,845	25,126
Frequency of Issuance	25%	29%	25%
Capital Raised/Total Assets	19%	23%	14%
B. Growth			
	1991–1999	*2000–2007*	*2009–2016*
Asset Growth	3.8%	9.5%	1.5%
Issuers	5.9%	15.1%	3.8%
Non-issuers	1.5%	7.8%	−0.8%
Employment Growth	1.7%	3.7%	1.3%
Issuers	4.3%	6.7%	2.8%
Non-issuers	0.2%	1.4%	0.2%
Sales Growth	2.8%	11.7%	0.4%
Issuers	3.7%	14.6%	2.3%
Non-issuers	0.3%	9.1%	−0.8%
GDP Growth	2.4%	8.3%	0.5%

issuers—23 percent of the total number of capital market issuers in the sample. Second, our findings are robust to (a) excluding utility companies (SIC codes 4900–4999) or (b) examining only manufacturing firms. Third, our findings also hold when excluding initial public offerings (IPOs), indicating that firms going public do not drive the results. Fourth, we observe a statistically significant increase in firm growth and investments in the year of issuance after excluding the years in which firms were acquirers in merger and acquisition (M&A) deals. This suggests that firms' expansion comes from their own internal growth, in addition to any growth generated by the M&A activity. To conduct this last test and identify acquirer firms, we use the variable *Net Assets from Acquisitions* from Worldscope. This variable represents assets acquired through the pooling of interests or mergers. About 52 percent of the firms in the sample (32,629 firms) conducted an M&A transaction.

2.2. Stylized facts on capital market growth and the comparative performance of issuing firms

We first document three key patterns in the data before conducting more rigorous empirical analyses in Section 3. To illustrate these patterns, we compare the beginning and end of the sample period to show how capital markets and issuance activity have changed over time and to describe how issuance and growth might be related. In later sections, we conduct these evaluations yearly rather than simply focusing on changes between these two points in time.

First, capital markets have grown markedly since the early 1990s and have become a sizeable source of corporate financing both in developing and high-income countries.[9] For the median country in the sample, equity and corporate bond market capitalization expanded from an average of 66 percent of GDP over the 1991–95 period to an average of 101 percent of GDP during the 2011–16 period. The market capitalization of equity and bonds is comparable to the stock of bank loans, which totaled about 98 percent of GDP in the median country during the 2011–16 period. Equity markets are on average double the size of corporate bond markets and account for an even larger proportion of capital markets in developing countries, where corporate bond markets are relatively underdeveloped. Security issuances have also grown materially. The per annum value of new issuances as a percentage of GDP for the median country rose from about 3.7 percent during the 1991–95 period to 6.3 percent during the 2011–16 period. Thus, whether considering market size or primary market activity, capital markets grew substantially in the median country relative to GDP.

Second, capital markets have expanded not only as measured by the aggregate size of markets and value of issuance activity. The number of firms raising capital through equity or bond issuances also increased, from 15,436 to 25,126 between the periods 1991–99 and 2009–16 (Table 1, Panel A). Firms actively use these markets to obtain financing. On average, firms raise capital between two and three times per decade, with the average issuance accounting for 19 percent of a firm's total assets.

Third, firms that raise funds in capital markets tend to grow at a faster pace than non-issuing listed firms, and at a faster pace than GDP (Table 1, Panel B). This growth differential is consistently positive over time and across different measures of firm performance. For example, over 2009–16, the annual growth rate of employment by issuing firms was 2.8 percent, whereas it was 0.2 percent in the case of non-issuing firms. In comparison, the average growth rate over time of the median

[9] We classify countries into developing and high-income following the World Bank classification of countries. High-income countries are those with a gross national income (GNI) per capita in 2016 above US$12,235. All other countries are classified as developing countries.

Table 2
Capital market financing and firm growth. This table reports difference-in-differences panel regressions of firm-level growth rates on issuance-window dummies. The estimations on firm-level growth rates have different dependent variables: total assets, sales, number of employees, property, plant, and equipment, and intangible assets. The issuance window dummies capture a five-year window around capital raising issuances that took place between 1991 and 2016. Three dummies are included in the regressions: a dummy for the issuance year, a dummy for the pre-issuance years equal to one for the two years preceding the issuance, and a dummy for the post-issuance years equal to one for the two years following the issuance. The table considers three different definitions of issuing firms: both equity and bond issuers (capital market issuers) (Panel A), only equity issuers (Panel B), and only bond issuers (Panel C). For each definition, firms with no issuances are included in the regressions as part of the control group. All regressions include firm and country-year fixed effects. They also include the one-year lagged values of the following firm-level controls: size (log of total assets), leverage (total debt/total assets), the current ratio (current assets/current liabilities), profitability (EBITDA/total assets), turnover (net sales/total assets), and the interest coverage ratio (EBITDA/interest expenses). The table reports Wald tests on the differences between the coefficients of the pre-issuance and issuance dummies. The table also reports the average growth of all firms (both issuers and non-issuers) in our dataset over the entire sample period. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Capital Market Issuers					
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	2.638***	3.942***	3.112***	4.456***	5.437***
	[0.864]	[0.647]	[0.562]	[0.706]	[0.881]
Issuance Year	15.499***	5.630***	5.551***	9.509****	11.514***
	[2.158]	[0.869]	[1.074]	[1.484]	[1.861]
Post Issuance Years	2.881***	2.000***	2.532***	5.224***	5.866***
	[0.636]	[0.559]	[0.454]	[0.765]	[0.744]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.367	0.287	0.234	0.236	0.165
Wald Test:					
Issuance vs. Pre Issuance Years	12.861***	1.688***	2.439***	5.053***	6.078***
Average Firm Growth (%)	7.456%	6.497%	4.477%	5.661%	10.094%
B. Equity Issuers					
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	1.225*	3.297***	2.526***	3.685***	4.356***
	[0.621]	[0.629]	[0.423]	[0.607]	[0.894]
Issuance Year	15.927***	5.602****	5.530***	9.415***	10.797****
	[2.175]	[0.939]	[0.943]	[1.476]	[1.785]
Post Issuance Years	2.741***	2.320***	2.711***	5.448***	6.285***
	[0.706]	[0.594]	[0.500]	[0.819]	[0.983]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.364	0.286	0.232	0.234	0.164
Wald Test:					
Issuance vs. Pre Issuance Years	14.702***	2.306***	3.004***	5.730***	6.440***
C. Bond Issuers					
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	5.684***	3.725***	3.260***	5.373***	6.366***
	[0.905]	[0.591]	[0.718]	[0.806]	[0.971]
Issuance Year	10.813***	4.453***	4.679***	7.638***	11.297***
	[2.067]	[0.758]	[1.252]	[1.300]	[2.500]
Post Issuance Years	3.001***	1.361***	1.165***	2.536***	2.490***
	[0.454]	[0.341]	[0.262]	[0.555]	[0.711]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.355	0.285	0.231	0.232	0.163
Wald Test:					
Issuance vs. Pre Issuance Years	5.129***	0.727	1.419**	2.265***	4.932**

listed firm in the median country is similar to the average GDP growth rate of the median country. For example, for the median listed firm, the average growth of sales was 2.8 percent over the period 1991–99, 11.7 percent over 2000–07, and 0.4 percent over 2009–16. This is similar to the average GDP growth rate for the median country, which was 2.4 percent, 8.3 percent, and 0.5 percent, respectively, over the same periods.

3. Capital market financing and firm performance

To assess the difference in performance between issuing and non-issuing firms, we employ an event study approach, where the dependent variable is a measure of firm growth around a five-year issuance window. We use a difference-in-differences regression strategy that evaluates the growth of issuing and non-issuing firms before, during, and after issuances. The treatment and control groups are defined on a yearly basis. For each given year, issuing firms are those that issued secu-

rities during that particular year. Non-issuing firms are those that did not issue in that particular year, which include the 17,347 firms that did not issue at all during the entire sample period. On average, there are 5,847 firms issuing equity and/or bonds and 21,299 non-issuing firms per year.

We focus on five measures of firm growth: the growth rate of total assets, sales, tangible fixed assets (PPE), intangible assets, and the number of employees. Whereas total assets will increase after a firm issues securities if the firm accumulates cash or other financial assets, increases in tangible fixed assets, intangible assets, and employees typically involve improvements in the productive capabilities of the business. To allow for potential differences across financing instruments, we separately analyze (a) the union of all equity and bond issuances (referred to as capital market issuances from now on), (b) equity issuances only, and (c) bond issuances only.

The regression equation is as follows:

$$Growth_{isct} = \gamma_0 + \gamma_1 PreIss_{isct} + \gamma_2 Issuance_{isct} + \gamma_3 PostIss_{isct} + \boldsymbol{X}_{isct} + \delta_i + \omega_{ct} + \varepsilon_{isct}, \quad (1)$$

where $Growth_{isct}$ is the growth rate of firm i, in industry s, in country c, during year t. The window around issuance is captured by (a) an issuance dummy that equals one in the year of issuance and zero otherwise ($Issuance_{isct}$), (b) a pre-issuance dummy that equals one for the two years before the issuance and zero otherwise ($PreIss_{isct}$), and (c) a post-issuance dummy that equals one for the two years after the issuance and zero otherwise ($PostIss_{isct}$).[10] The estimated coefficients provide information on the average growth rate of firms during the pre-issuance, issuance, and post-issuance years relative to the growth rate during the years outside the issuance window. Namely, the estimated coefficients show the growth rate differential around the issuance years vis-à-vis the growth rate of all the firms in the sample during their non-issuance years.

The regressions control for firm (δ_i) and country-year fixed effects (ω_{ct}) to account for possible time-invariant heterogeneity across firms and for factors that affect countries over time. They also control for several time-variant firm characteristics ($\boldsymbol{X}_{isct}$): the one-year lagged values of firm size (log of total assets), leverage (total debt/total assets), the current ratio (current assets/current liabilities), profitability (EBITDA/total assets), turnover (net sales/total assets), and the interest coverage ratio (EBITDA/interest expenses).[11]

The estimates for capital market issuances show that issuing firms typically grow significantly faster than non-issuing firms before, during, and after the issuance of securities (Table 2, Panel A). This growth differential significantly widens during the issuance year, as indicated by the two-tailed Wald tests between the coefficients of the issuance and pre-issuance dummies. For instance, total assets of issuing firms grow, on average, 15.50 percentage points faster than those of non-issuing firms in the year of issuance, up from 2.64 percentage points during the pre-issuance years. The predicted growth differential in total assets in the year of issuance is approximately 2 times faster than the growth rate of the average firm in the sample.

The faster expansion of firms' assets around the time of issuance implies that the funds raised from securities are not simply used to rebalance firms' financial accounts. Some researchers argue that firms could raise capital to pay off liabilities (debt retirement), replace more expensive financing with cheaper funding, minimize taxes, or change the duration of debt (Pagano et al., 1998; Makan and Demos, 2012; Alden, 2014; Bass and Smith, 2018; Fan, 2019). However, our evidence shows that they are also used for firms' expansion. These findings on assets, however, do not show whether there is a material increase in productive capabilities, as firms can also use the funds to accumulate cash and make financial investments, acting themselves as financial intermediaries (Baker and Wurgler, 2002; De Angelo et al., 2010; McLean, 2011; Bruno and Shin, 2017; McLean and Zhao, 2018).[12] Thus, the estimates of the regressions on tangible fixed assets, intangible assets, and employment are of special interest.

As in the case of total assets, the growth rates of tangible fixed assets, intangible assets, and employment are larger for issuing firms than for non-issuing firms during the entire five-year issuance window. This growth differential accelerates significantly during the issuance year. For example, during the issuance year, the growth rates of employment, tangible and intangible assets are, respectively, 5.55, 9.51, and 11.51 percentage points faster for issuing firms than for non-issuing ones.[13] These results are consistent with firms using the funds raised in capital markets to increase productive capabilities.

Cumulatively, the positive growth differential between issuers and non-issuers is larger than the one implied by each regression coefficient separately, and it translates into large differentials over time (Fig. 1). For example, assuming that issuers and non-issuers are ex ante equal in terms of the number of employees, the former would become 17.98 percent larger than the latter at the end of the 5-year issuance window.[14] This cumulative growth differential is even larger if we take

[10] We report standard errors clustered at the country level, but results are robust to clustering at either the firm level or the country-year level.

[11] Results are robust to the use of alternative measures of firm size, including the log of sales and the log of employees.

[12] The literature identifies three main motives for firms' cash accumulation: (a) precautionary savings while funding conditions are good, (b) market timing to benefit from equity overvaluation, and (c) carry-trade to benefit from high-interest rate differentials between domestic and foreign currencies.

[13] In the post-issuance years, growth stabilizes and slows down relative to the peak, as firms already realized their investment opportunities. Although factor accumulation generally increases the productive capacity of a firm (e.g., its scale), it does not necessarily lead to improvements in output per unit of labor or capital, especially if the firm faces decreasing marginal returns. Productivity could increase, for example, if firms exhibit increasing returns to scale, which is not always the case, or if firms improve their production technologies.

[14] The cumulative size differential is equivalent to the cumulative growth differential as we normalize the ex ante size of both issuers and non-issuers to one, and we assume zero growth for non-issuers. That is, for Fig. 1, we do not take into account the coefficients on the fixed effects. However, qualitatively similar estimates would be obtained if we assumed a positive growth rate for non-issuers.

into account that issuing firms tend to issue more than once during their lifetime (Table 1). For the 1991–2016 period, considering that the median firm issues about two times per decade and that employment at non-issuing firms grows on average at 0.97 percent per annum, the estimates predict that employment at issuing firms would grow at about 4.3 percent per annum. This would imply a cumulative size differential of 127 percent at the end of the sample period.

Although both equity and bond issuers tend to grow faster than non-issuers, the increase in growth rates associated with equity issuances is larger than that associated with bond issuances. For example, the growth differential between equity issuers and non-issuers is on average 3 percentage points larger, as measured by employees, in the year of issuance relative to the pre-issuance period, whereas this growth acceleration is about 1.4 percentage points for bond issuers (Table 2, Panels B and C).[15] Equity issuers grow faster than bond issuers even though equity issuances tend to be smaller. The median equity issuer raises about US$20.55 million per issuance, whereas the median bond issuer raises US$77.91 million per issuance. These results further contribute to an extensive body of research that finds that high-growth and riskier firms are more likely to issue equity than debt due to the nature of equity contracts (Jensen and Meckling, 1976; Myers, 1977; Marsh, 1982; Rajan and Zingales, 1995; Fluck, 1998; Gul, 1999; Bolton and Freixas, 2000; Barclay et al., 2003; Hosono, 2003; Johnson, 2003; Hovakimian et al., 2004; Billett et al., 2007; Gatchev et al., 2009; Wu and Au Yeung, 2012).

To assess the robustness of our results, we conduct the following tests. First, we control for the potential non-linear effects of debt on firm growth by including the lagged value of a dummy variable for firms with a heavy debt burden. Specifically, we follow Gebauer et al. (2018) and define firms with a large debt burden as those with a leverage ratio above 80 percent. When adding this dummy variable, we continue to include the control variables for debt levels and financial vulnerability discussed above (Coricelli et al., 2012; Goretti and Souto, 2013; Kalemli-Özcan et al., 2020). In line with previous studies, our results show that highly indebted firms grow relatively more slowly than other firms (Appendix Table 3). Still, the inclusion of the heavy debt burden dummy does not qualitatively change our results on the faster growth of issuing firms around their issuance activity.[16]

Second, to address possible concerns that these findings on the growth differential between issuing and non-issuing firms are driven by one or a few industries, we separately examine the major industry categories. The growth differential patterns hold across each industry (Table 3): issuing firms tend to grow faster than non-issuing firms and part of the funds raised from issuances are used to increase firms' productive capabilities as measured by employees, tangible fixed assets, and intangible assets. These findings suggest that the results are not driven by any specific industry.[17]

4. Firm heterogeneity

In this section, we examine whether the growth differentials between issuing and non-issuing firms are more pronounced among firms that are more likely to face tighter financing constraints. To the extent that firms lack access to non-capital market sources of financing, the growth differential between issuing and non-issuing firms would likely be larger because there are fewer alternatives to relieving financing constraints. Similarly, to the extent that financing constraints prevented firms from exploiting growth opportunities, relaxing these constraints through the issuances of stocks or bonds would likely be associated with larger increases in investments than if those firms faced less restrictive financing constraints before issuing securities.

We consider three proxies for the severity of firm financing constraints: firm size, age, and R&D intensity. We follow the literature that argues that relatively small, young, and innovative firms are more prone to underinvestment due to financing frictions. These firms tend to be more informationally opaque, riskier, and tend to have fewer tangible assets to offer as collateral. We measure firm size with the log of assets, firm age with the number of years since its establishment, and firm R&D intensity with the log of the ratio of R&D expenditures to total investment (the sum of capital expenditures and R&D expenditures).

4.1. An illustration of growth differentials by size, age, and R&D intensity

We begin the analyses by estimating how the growth differentials between issuing and non-issuing firms vary with firm size, age, and R&D intensity. We do this by estimating the specification described in Section 3 with regressions by quantiles. As earlier, we regress firm growth on three issuance-window dummy variables (pre-, during, and post-issuance). However, we now estimate one regression for each decile of the firm size, age, and R&D intensity distributions. Firms are classified according to their median value in each variable over the period 1991–2016. We illustrate the results from these regressions by quantiles in Fig. 2, focusing on the estimates for the growth in assets in the year of issuance. Along the vertical axis, we

[15] Both differentials are significant in economic terms. The estimated growth acceleration during the issuance year represents 67 percent and 31 percent of the average firm growth in the sample for equity and bond issuers, respectively.

[16] In alternative specifications, we extend the regressions reported in Appendix Table 3 to include the interaction of the debt overhang dummy with the dummies around the issuance year. We obtain similar results in that firms with debt overhang grow more slowly.

[17] We conduct two additional (unreported) robustness tests. First, we restrict the sample to firms that issued equity or bonds at least once during the period 1991–2016. The reason is that publicly listed firms that never issued during this period might be slow growing. Second, given that our sample comprises the period of the global financial crisis, we estimate the regressions separately for the pre-crisis (1991–2007) and post-crisis periods (2010–2016). The core results of the paper hold when computing these alternative specifications.

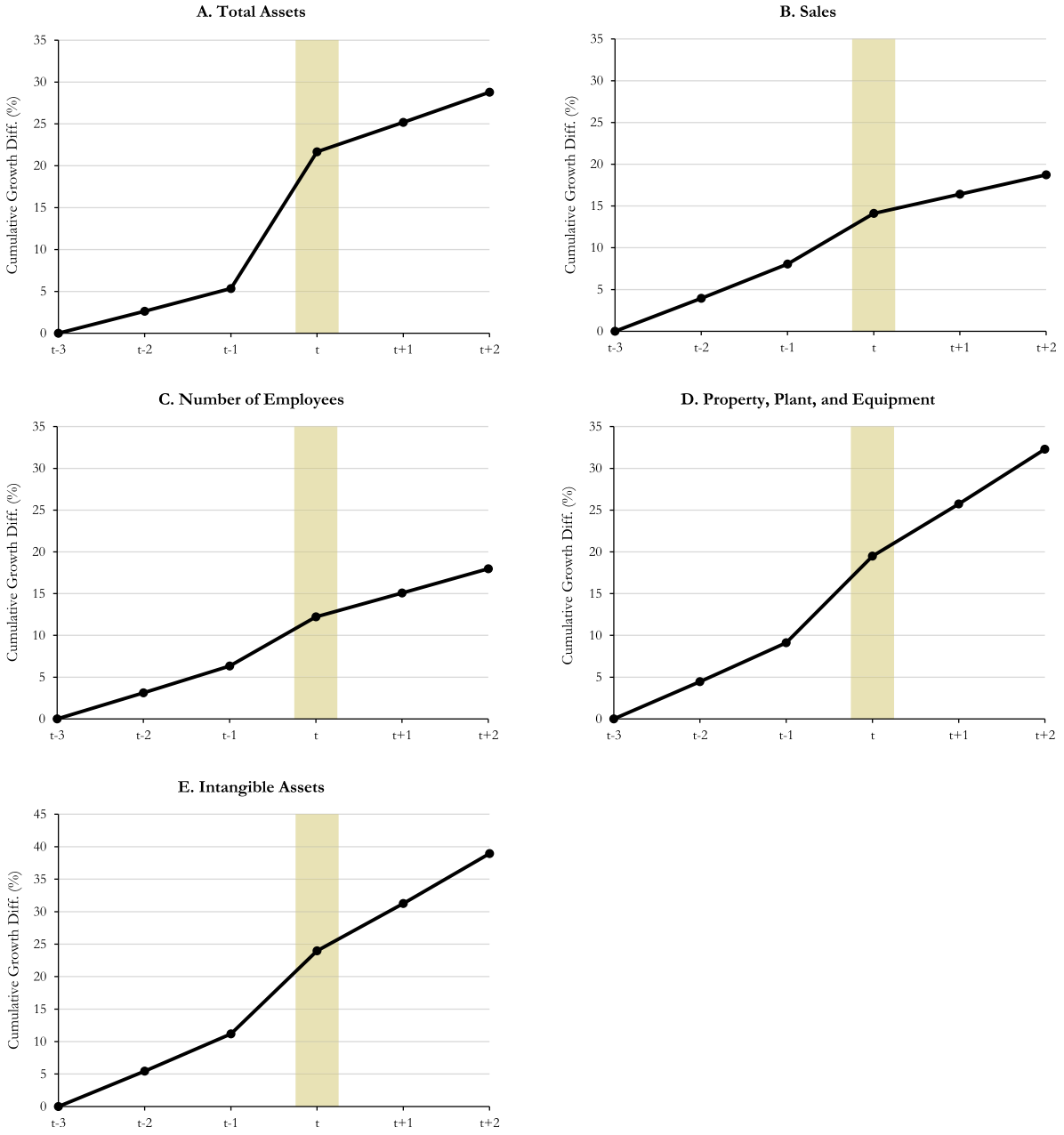

Fig. 1. Cumulative growth differential. This figure shows the cumulative growth differential between issuers and non-issuers around a 5-year issuance window. It shows the growth differentials for: total assets; sales; number of employees; property, plant, and equipment; and intangible assets. The estimates are calculated based on the regression coefficients reported in Table 2. The figure considers both equity and bond issuers (capital market issuers). The figure shows the cumulative growth differential around the issuance years vis-à-vis the growth rate of all the firms in the sample during their non-issuance years. Year *t* refers to the year of issuance. Growth rates for both issuers and non-issuers are normalized to 100 in year *t-3*. The years *t-2* and *t-1* (*t + 2* and *t + 1*) refer to the pre-issuance (post-issuance) period.

plot the estimated growth differential between issuing and non-issuing firms and provide the 95 percent confidence interval around each estimate. We do this for each decile of the firm size distribution in Panel A, each decile of the firm age distribution in Panel B, and each decile of the firm R&D intensity distribution in Panel C. In this way, we illustrate how the growth gap between issuing and non-issuing firms varies by each firm characteristic.

The results from the regressions by quantiles indicate that security issuances are associated with greater accelerations in firm growth among smaller, younger, and higher-R&D firms (Fig. 2). For example, issuing firms at the bottom decile of the size distribution (small firms) grow, on average, 36.50 percentage points faster than non-issuing firms in terms of assets, whereas this growth differential is about 6.85 percentage points for firms at the top decile. Still, the growth differential at

Table 3

Capital market financing and firm growth across industries. This table reports difference-in-differences panel regressions of firm-level growth rates on issuance-window dummies. Separate regressions are estimated for firms in each one-digit SIC industry. The estimations on firm-level growth rates have different dependent variables: total assets, sales, number of employees, property, plant, and equipment, and intangible assets. The issuance window dummies capture a five-year window around capital raising issuances that took place between 1991 and 2016. Three dummies are included in the regressions: a dummy for the issuance year, a dummy for the pre-issuance years equal to one for the two years preceding the issuance, and a dummy for the post-issuance years equal to one for the two years following the issuance. Firms with no issuances are also included in the regressions as part of the control group. All regressions include firm and country-year fixed effects as well as the firm-level controls described in Table 2. The table also reports Wald tests on the differences between the coefficients of the pre-issuance and issuance dummies. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Total Assets

	Agriculture, Forestry, and Fishing	*Mining*	*Construction*	*Manufacturing*	*Transportation, Communications, Electric, Gas, and Sanitary Services*	*Wholesale Trade*	*Retail Trade*	*Services*
Pre Issuance Years	2.953	2.633	2.735***	2.039***	3.260**	2.899***	1.581	2.196
	[1.844]	[1.580]	[0.990]	[0.640]	[1.284]	[0.948]	[1.193]	[1.609]
Issuance Year	14.597***	22.614***	11.350***	14.094***	11.984***	12.193***	9.173***	19.309***
	[3.220]	[3.134]	[1.560]	[2.494]	[1.506]	[2.376]	[2.338]	[2.370]
Post Issuance Years	5.488***	4.953***	3.841***	1.826***	2.263***	4.715***	2.337**	3.841***
	[1.563]	[1.717]	[1.067]	[0.560]	[0.579]	[1.194]	[0.954]	[0.765]
No. of Observations	5,796	32,202	25,444	267,930	52,377	28,023	31,742	82,772
R-squared	0.480	0.396	0.427	0.367	0.379	0.368	0.397	0.394
Wald Test:								
Issuance vs. Pre Issuance Years	11.644***	19.981***	8.616***	12.055***	8.723***	9.293***	7.592***	17.113****

B. Sales

	Agriculture, Forestry, and Fishing	*Mining*	*Construction*	*Manufacturing*	*Transportation, Communications, Electric, Gas, and Sanitary Services*	*Wholesale Trade*	*Retail Trade*	*Services*
Pre Issuance Years	6.763***	2.954	5.331***	3.576***	3.303***	4.727***	2.081**	3.802***
	[1.697]	[2.335]	[1.094]	[0.723]	[0.608]	[1.420]	[0.880]	[0.953]
Issuance Year	3.642**	4.253	5.065***	4.522***	5.608***	5.293***	3.870***	7.975***
	[1.505]	[3.381]	[1.137]	[0.828]	[1.105]	[1.088]	[1.017]	[1.432]
Post Issuance Years	2.588*	4.503**	2.426**	1.072**	2.388***	1.870	1.435*	2.526***
	[1.445]	[1.952]	[1.203]	[0.525]	[0.606]	[1.445]	[0.767]	[0.596]
No. of Observations	5,719	26,127	25,285	264,873	51,823	27,853	31,674	80,674
R-squared	0.358	0.281	0.289	0.303	0.337	0.307	0.393	0.320
Wald Test:								
Issuance vs. Pre Issuance Years	−3.121*	1.299	−0.266	0.946	2.304***	0.566	1.789***	4.173***

C. Number of Employees

	Agriculture, Forestry, and Fishing	*Mining*	*Construction*	*Manufacturing*	*Transportation, Communications, Electric, Gas, and Sanitary Services*	*Wholesale Trade*	*Retail Trade*	*Services*
Pre Issuance Years	2.761	3.854**	1.994**	2.812***	3.481***	2.635**	2.246**	3.120***
	[2.215]	[1.490]	[0.806]	[0.574]	[0.829]	[1.098]	[0.910]	[0.284]
Issuance Year	6.124***	7.108***	4.696***	4.699***	5.341***	4.886***	2.689**	7.610***

Table 3 (*continued*)

	[1.460]	[0.935]	[1.338]	[1.013]	[1.095]	[1.555]	[1.321]	[1.157]
Post Issuance Years	5.192***	2.906***	2.188**	1.931***	2.156***	3.153***	1.949*	3.809***
	[1.061]	[0.959]	[0.994]	[0.398]	[0.626]	[0.912]	[0.995]	[0.493]
No. of Observations	3,018	16,415	17,533	195,642	38,534	21,176	25,750	61,509
R-squared	0.365	0.287	0.223	0.226	0.245	0.242	0.271	0.290
Wald Test:								
Issuance vs. Pre Issuance Years	3.363	3.254**	2.701**	1.887***	1.860***	2.251***	0.443	4.490***

D. Property, Plant, and Equipment

	Agriculture, Forestry, and Fishing	*Mining*	*Construction*	*Manufacturing*	*Transportation, Communications, Electric, Gas, and Sanitary Services*	*Wholesale Trade*	*Retail Trade*	*Services*
Pre Issuance Years	3.349**	7.523***	4.009**	3.855***	4.142***	4.186***	3.028***	4.483***
	[1.542]	[1.106]	[1.602]	[0.713]	[1.045]	[1.328]	[0.853]	[0.947]
Issuance Year	10.388***	18.592***	8.029***	7.345***	9.269***	9.402***	6.125***	10.284***
	[2.237]	[2.801]	[1.620]	[1.182]	[1.317]	[1.671]	[2.134]	[2.230]
Post Issuance Years	7.133***	5.146***	4.848***	4.786***	3.685***	6.558***	3.408***	5.586***
	[1.978]	[0.921]	[1.256]	[0.841]	[0.540]	[1.640]	[1.009]	[0.713]
No. of Observations	5,739	31,085	25,274	266,238	51,936	27,827	31,594	81,126
R-squared	0.378	0.281	0.229	0.246	0.277	0.218	0.292	0.249
Wald Test:								
Issuance vs. Pre Issuance Years	7.039***	11.069***	4.020**	3.490***	5.127***	5.217***	3.097*	5.802***

E. Intangible Assets

	Agriculture, Forestry, and Fishing	*Mining*	*Construction*	*Manufacturing*	*Transportation, Communications, Electric, Gas, and Sanitary Services*	*Wholesale Trade*	*Retail Trade*	*Services*
Pre Issuance Years	11.368**	8.274***	6.842**	5.168***	6.755***	4.357*	2.751**	5.222***
	[5.235]	[2.896]	[2.766]	[0.947]	[1.373]	[2.373]	[1.171]	[0.976]
Issuance Year	8.488	12.567***	8.359***	10.908***	11.148***	10.734***	5.256*	14.472***
	[5.484]	[1.811]	[2.798]	[1.632]	[2.087]	[3.109]	[2.674]	[2.579]
Post Issuance Years	13.814***	3.741	5.689***	4.593***	0.675	9.949***	1.413	11.687***
	[4.007]	[2.746]	[1.744]	[0.985]	[1.512]	[2.297]	[1.618]	[1.051]
No. of Observations	3,521	11,293	17,406	196,789	36,880	20,442	24,113	62,790
R-squared	0.317	0.260	0.202	0.154	0.202	0.194	0.213	0.235
Wald Test:								
Issuance vs. Pre Issuance Years	−2.880	4.293	1.516	5.739***	4.393**	6.376**	2.505	9.250***

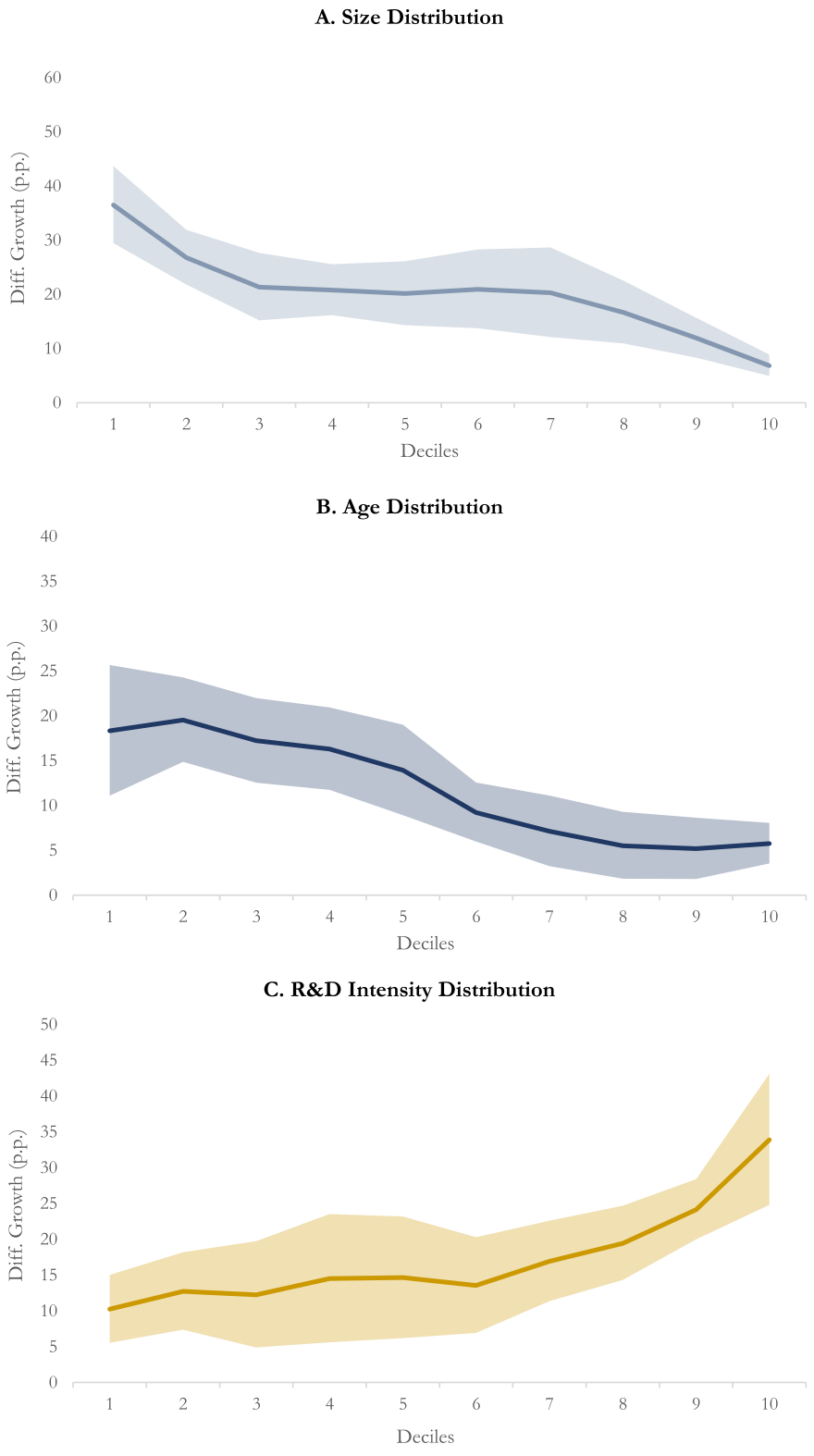

Fig. 2. Heterogeneity across firms. This figure shows the estimated annual growth rate differential in total assets between issuers and non-issuers at the year of issuance for each decile of the distributions of firm size (Panel A), age (Panel B), and R&D intensity (Panel C). The statistics shown in this figure are obtained from the estimation of regressions by quantiles using the specification described in Table 2 for each decile of the distribution. The shaded area shows the confidence interval around those estimates at the 95% statistical confidence level. Firm size is measured as the log of total assets and R&D intensity as the log of the R&D-to-total investment. Firms are assigned into each decile based on their median size, age, and R&D intensity over the sample period.

the top decile is economically significant, being 56 percent larger than the average GDP growth (of 4.39 percent) across countries in the sample for the 1991–2016 period. When classified according to the degree of R&D intensity, issuing firms at the top 10 percent of the R&D intensity distribution (high-R&D firms) grow 23.65 percentage points faster in terms of assets than those at the bottom 10 percent. These results hold not only when comparing firms at the extremes of the distribution, but also when observing the entire distribution. That is, the growth differential between issuers and non-issuers monotonically declines along the deciles of the firm size and age distributions, and monotonically increases along the R&D intensity distribution. Qualitatively similar patterns, although not strictly monotonic, are obtained when measuring firm growth in sales, number of employees, tangible fixed assets, and intangible assets (Appendix Fig. 1).

In Sections 4.2 and 4.3, we complement this analysis by examining differences across financing instruments (equity versus bonds). Also, we formally test whether the heterogeneity across firm size, age, and R&D intensity is statistically significant and economically relevant, considering the entire issuance window (including the pre- and post-issuance years). To do so, we pool all observations and estimate a simpler regression specification based on categorical variables.

4.2. Firm size and firm age

We now examine the comparative growth performance of issuing and non-issuing firms, while differentiating them by size and age. The fact that smaller and younger firms are often more informationally opaque, have a shorter history, and generally have less collateral than larger, more established firms aggravate financial frictions, and thus make it more difficult for them to access external finance at reasonably favorable terms. This makes their investments and growth more dependent on the availability of internally generated funds.[18] To the extent that smaller and younger firms face more binding financing constraints before issuing securities, we expect that relaxing those constraints through securities issuances will be associated with a greater surge in investment and growth among these types of firms. We test this view by including a dummy for small (young) firms in our baseline regression, as well as its interaction with the pre-, during, and post-issuance dummy variables. This leads to the following empirical specification:

$$Growth_{isct} = \gamma_0 + \gamma_1 PreIss_{isct} + \gamma_2 Issuance_{isct} + \gamma_3 PostIss_{isct} + \gamma_4 Small_{isct} + \gamma_5 (PreIss_{isct} * Small_{isct}) + \gamma_6 (Issuance_{isct} * Small_{isct}) + \gamma_7 (PostIss_{isct} * Small_{isct}) + \boldsymbol{X}_{isct} + \delta_i + \omega_{ct} + \varepsilon_{isct}, \quad (2)$$

where the coefficients on the interaction terms tell us how the differential growth between issuers and non-issuers compares between small and large firms. We estimate separate regressions in which we differentiate firms by age rather than by size.

To estimate equation (2), we consider several empirical definitions of a "small" firm. One method is to define firms as large or small based on the median value of assets across firms in a particular country and year (50 percent threshold). A second method is to define a broader selection of firms as small given that the size distribution of firms is highly skewed. Thus, we define small as the bottom 75 percent of all sampled firms in a given country and year (75 percent threshold). Following the methodology in Calomiris et al. (2021), these two methods use country-year distributions to classify firms as large or small because a firm that is comparatively large in one country might be comparatively small in another.[19] We also use alternative methods that examine all firms in the sample, rather than using these country-year benchmarking samples. All of the methods yield qualitatively similar results. We report the findings using the definition of "small" as firms at the bottom 75 percent of sampled firms in each country and year.

For firm age, we consider three alternative measures. The first two measures are discrete, defining a firm as "young" if it has been alive for less than 15 or 10 years, respectively. The third measure is a continuous variable *age*, which equals the number of years since the firm was established. Again, the results are qualitatively similar when using the different definitions of young firms. We report the results using the definition of young as firms that have been alive for less than 15 years. Both the small and young dummies vary within firms over time.

The estimations show that capital market issuances are associated with faster growth among smaller and younger firms than among their larger and older counterparts (Tables 4 and 5). Moreover, these growth differences are especially pronounced when focusing on equity market issuances. For example, in the year of issuance, the growth rate of employment is 4.51 (6.02) percentage points faster for small (young) issuing firms than for large (old) issuing firms, which in turn grow 3.28 (3.30) percentage points faster than non-issuing firms. These growth differences between small and large issuing firms, and between young and old issuing firms, are economically large, as the average growth rate of firm employment in the overall sample is about 4.48 percent per annum.[20]

Overall, we find a marked acceleration of firm growth around issuances in the groups of firms that are expected to be especially sensitive to capital market financing. Even within the universe of publicly listed firms, for which the financing con-

[18] Several papers find that smaller and younger firms display higher investment-cash flow sensitivities than larger and more mature firms (Fazzari et al., 1988; Gilchrist and Himmelberg, 1995; Oliveira and Fortunato, 2006; Carpenter and Guariglia, 2008; Mulier et al., 2016). Other studies argue that financial constraints are captured by a firm's propensity to save cash out of cash flows, the so-called cash flow sensitivity of cash (Almeida et al., 2004).

[19] For example, the median listed firm in China has US$242.66 million in assets, whereas the median listed firm in Vietnam has US$17.01 million in assets. Therefore, a firm that has US$100 million in assets is considered large in Vietnam, whereas it is small in China.

[20] The findings hold when both firm size and age are simultaneously included in the estimations. That is, capital market issuances are associated with faster growth among both small and young firms.

straint problems should be somehow attenuated, we still find economically and statistically significant heterogeneity based on firm size and age.

4.3. High-R&D industry

We next evaluate the comparative growth performance of issuing and non-issuing firms, while differentiating by their R&D intensity. High-R&D firms tend to have a larger proportion of intangible assets relative to tangible assets.[21] Intangible assets, however, are perceived as less valuable forms of collateral because they are more difficult to value, less liquid, and riskier than tangible assets. Hence, intangible assets are often less effective at easing firms' credit constraints. Moreover, innovative firms tend to use cutting-edge technologies to develop new products and processes, which are generally riskier and more difficult to evaluate and monitor, accentuating asymmetric information problems. To the extent that high-R&D firms face more stringent financing constraints because of their novel activities and their higher proportion of intangible assets, we expect that security issuances will be associated with a greater surge in investments and growth among high-R&D firms.

Furthermore, research suggests that equity is more effective than debt for funding innovative-intensive activities, firms, and industries. Equity contracts do not require collateral and do not aggravate firms' problems of financial distress. Moreover, equity holders directly benefit when the firm succeeds. In contrast, debt holders are comparatively wary of high-R&D firms, as they focus less on the right-hand tail of the return distribution and more on default probabilities, collateral, and cash flows. Consequently, firms might use bank or bond financing to fund tangible investments, such as PPE, and equity financing to fund intangible investments. The distinction between equity and bond financing is thus particularly important when analyzing the performance of high-R&D firms around capital market issuances. Because of the innovative nature of these firms and their higher dependence on intangible assets, we hypothesize that high-R&D firms would observe relatively higher growth rates around equity issuances than other issuing firms.

To study how high-R&D firms perform around episodes of capital market financing, we extend our baseline specification (Equation (1)) and include a high-R&D dummy interacted with the pre-, during, and post-issuance dummies. The estimation results are reported in Table 6. Specifically, for each of the five measures of firm growth, we estimate:

$$\begin{aligned} Growth_{isct} = {} & \gamma_0 + \gamma_1 PreIss_{isct} + \gamma_2 Issuance_{isct} + \gamma_3 PostIss_{isct} + \gamma_4 HighR\&D_s + \gamma_5 (PreIss_{isct} * HighR\&D_s) \\ & + \gamma_6 (Issuance_{isct} * HighR\&D_s) + \gamma_7 (PostIss_{isct} * HighR\&D_s) + \boldsymbol{X}_{isct} + \delta_i + \omega_{ct} + \varepsilon_{isct}, \end{aligned} \tag{3}$$

where $HighR\&D_s$ is a dummy that equals one if the firm is in a high-R&D industry, and zero otherwise.

To compute the industry-level R&D intensity, we follow the literature and use the United States as a benchmark.[22] This approach assumes that publicly listed U.S. firms face relatively frictionless capital markets and, thus, their R&D investment is primarily driven by technological demand (Rajan and Zingales, 1998). Specifically, we obtain the ratio of R&D expenditures to total investments for the median firm in the United States within each 2-digit SIC industry over the period 1991–2016 (Brown et al., 2017). If this ratio is above 0.6 for a given industry, the industry is classified as high-R&D.[23] This industry classification for the United States is then applied to all other countries. This classification does not vary either across countries or over time. Moreover, it yields marked differences in the asset composition across high- and low-R&D firms in the sample. For example, the ratio of intangible to tangible assets is 0.62 for the median high-R&D firm in the average country, whereas it is 0.09 for the median non-high-R&D firm.

Consistent with the arguments presented above, the estimates show that: (a) equity issuances are associated with faster growth among high-R&D issuing firms than among other issuing firms; and (b) equity issuances have an especially strong, positive link with intangible investments by high-R&D firms. As predicted, these patterns hold for equity financing but not for bond financing (Table 6, Panels B and C). As an example of the first finding, in the year of an equity issuance, the growth rate of employment is 1.91 percentage points faster for high-R&D firms than other issuing firms. On the second finding, our results indicate that intangible investments are, in fact, more responsive to equity issuances than investments in fixed capital. In the year of an equity issuance, the growth of intangible assets is 2.79 percentage points higher for high-R&D issuers than for the rest of issuers, and this differential increases to 4.18 percentage points during the post-issuance years (Table 6, Panel B).[24] In contrast, the interaction term for tangible fixed assets is not significant in the year of issuance and is quantitatively small in the post-issuance period.

[21] Intangible assets refer to those assets that do not have a physical existence and whose value lies in their expected future return (e.g., goodwill, patents, copyrights, trademarks, software developed, and customer lists), as defined in Worldscope.

[22] We conduct several robustness tests using alternative samples and measures of R&D intensity. Notably, we obtain similar results to those reported in Table 6 if we: (a) use the continuous version of the high-R&D dummy (based on U.S. data), (b) exclude the U.S. from the sample, and (c) restrict the sample to the manufacturing industry, defining high-R&D industries as those with a SIC code in the groups 28, 35, 36, and 38.

[23] This threshold corresponds to the industry at the 75th percentile of the R&D intensity distribution for the U.S. Based on this classification, high-R&D industries correspond to two-digit SICs 28 (chemical and allied products), 35 (industrial machinery and equipment), 36 (electronic and other electric equipment), 38 (instruments and related products), 73 (business services), and 87 (engineering and management services). Most of the firms with an industry classification in business services have a four-digit SIC between 7371 and 7375, which involves activities such as computer programming, computer processing, and information retrieval.

[24] The estimated differential growth between high-R&D issuers and the rest of issuers during the year of an equity issuance is approximately 28 percent of the average firm growth in intangibles in our sample.

Table 4

Growth of small firms. This table reports difference-in-differences panel regressions of firm-level growth rates on issuance-window dummies for small versus large firms. The estimations on firm-level growth rates have different dependent variables: total assets, sales, number of employees, property, plant, and equipment, and intangible assets. The regressions include three dummies to capture a five-year issuance window: a dummy for the issuance year, a dummy for the pre-issuance years equal to one for the two years preceding the issuance, and a dummy for the post-issuance years equal to one for the two years following the issuance. These dummies consider issuances that took place between 1991 and 2016. Interaction terms between these issuance dummies and a small-firm dummy are also included in the regressions. Firms are classified as small if the value of their total assets is in the bottom 75th percentile of all sampled firms in a given country and year. Thus, the classification of small firms can vary within firms over time. The table considers three different definitions of issuing firms: both equity and bond issuers (capital market issuers) (Panel A), only equity issuers (Panel B), and only bond issuers (Panel C). For each definition, firms with no issuances are also included in the regressions as part of the control group. All regressions include firm and country-year fixed effects as well as the firm-level controls described in Table 2. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Capital Market Issuers

	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	2.753***	2.748***	2.247***	3.286***	5.444***
	[0.349]	[0.418]	[0.340]	[0.409]	[0.864]
Issuance Year	6.859***	3.665***	3.276***	5.739***	7.845***
	[0.918]	[0.535]	[0.744]	[0.789]	[1.505]
Post Issuance Years	0.176	0.578	0.846***	1.237***	−0.046
	[0.279]	[0.443]	[0.262]	[0.417]	[0.751]
Small Dummy	8.148***	7.967***	2.564***	5.457***	8.358***
	[0.729]	[0.963]	[0.851]	[0.877]	[1.816]
Pre Issuance Years * Small Dummy	3.258**	3.983***	2.499***	3.949***	2.988**
	[1.476]	[0.931]	[0.580]	[0.951]	[1.460]
Issuance Year * Small Dummy	14.703***	3.875***	4.513***	6.767***	7.534***
	[2.099]	[0.938]	[0.825]	[1.305]	[1.956]
Post Issuance Years * Small Dummy	−0.065	−0.357	1.449***	3.678***	6.182***
	[1.185]	[0.587]	[0.425]	[0.796]	[1.354]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.304	0.266	0.221	0.220	0.155

B. Equity Issuers

	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	1.940***	2.429***	1.815***	2.495***	5.455***
	[0.369]	[0.434]	[0.319]	[0.496]	[0.969]
Issuance Year	6.385***	4.058***	2.874***	5.003***	6.466***
	[0.947]	[0.644]	[0.557]	[0.796]	[1.158]
Post Issuance Years	0.471	1.534***	1.044***	1.428**	1.344
	[0.373]	[0.509]	[0.388]	[0.569]	[0.918]
Small Dummy	8.433***	8.195***	2.753***	5.611***	9.142***
	[0.671]	[0.912]	[0.824]	[0.816]	[1.766]
Pre Issuance Years * Small Dummy	4.058**	4.510***	2.882***	4.863***	2.968**
	[1.547]	[0.776]	[0.594]	[0.982]	[1.404]
Issuance Year * Small Dummy	16.217***	4.048***	5.319***	8.062***	9.487***
	[2.173]	[1.154]	[0.941]	[1.426]	[1.860]
Post Issuance Years * Small Dummy	0.842	−0.277	2.010***	4.564***	5.974***
	[0.945]	[0.560]	[0.385]	[0.633]	[1.318]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.303	0.266	0.220	0.220	0.154

(*continued on next page*)

Table 4 (*continued*)

	C. Bond Issuers				
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	2.884***	2.209***	1.841***	3.355***	4.123***
	[0.392]	[0.448]	[0.286]	[0.439]	[0.686]
Issuance Year	6.227***	2.573***	3.188***	5.380***	8.124***
	[1.173]	[0.508]	[0.923]	[0.836]	[2.037]
Post Issuance Years	−0.648**	−1.032**	−0.066	0.285	−2.039**
	[0.316]	[0.425]	[0.318]	[0.298]	[0.938]
Small Dummy	11.649***	9.764***	4.260***	8.824***	11.690***
	[1.192]	[1.021]	[0.963]	[1.289]	[1.762]
Pre Issuance Years * Small Dummy	3.125**	1.235	2.284**	2.678	2.516
	[1.558]	[1.636]	[1.143]	[1.669]	[1.963]
Issuance Year * Small Dummy	11.649***	9.764***	4.260***	8.824***	11.690***
	[2.033]	[0.601]	[0.954]	[1.253]	[1.844]
Post Issuance Years * Small Dummy	−2.821	−1.593	−0.890	−1.408	2.246
	[2.165]	[1.265]	[0.741]	[1.695]	[1.582]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.287	0.263	0.216	0.215	0.152

Table 5

Growth of young firms. This table reports difference-in-differences panel regressions of firm-level growth rates on issuance-window dummies for young versus old firms. The estimations on firm-level growth rates have different dependent variables: total assets, sales, number of employees, property, plant, and equipment, and intangible assets. The regressions include three dummies to capture a five-year issuance window: a dummy for the issuance year, a dummy for the pre-issuance years equal to one for the two years preceding the issuance, and a dummy for the post-issuance years equal to one for the two years following the issuance. These dummies consider issuances that took place between 1991 and 2016. Interaction terms between these issuance dummies and a young-firm dummy are also included in the regressions. Firms are classified as young if they are younger than 15 years. Thus, the classification of young firms varies within firms over time. The table considers three different definitions of issuing firms: both equity and bond issuers (capital market issuers) (Panel A), only equity issuers (Panel B), and only bond issuers (Panel C). For each definition, firms with no issuances are included in the regressions as part of the control group. All regressions include firm and country-year fixed effects as well as the firm-level controls described in Table 2. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Capital Market Issuers

	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	2.214***	1.837***	2.175***	3.112***	4.367***
	[0.457]	[0.298]	[0.523]	[0.507]	[0.849]
Issuance Year	8.583***	3.883***	3.299***	5.636***	8.478***
	[1.890]	[0.648]	[1.017]	[1.401]	[2.107]
Post Issuance Years	1.319**	0.861**	1.566***	2.726***	2.793**
	[0.511]	[0.405]	[0.285]	[0.447]	[1.286]
Young Dummy	2.210***	2.138**	1.119	2.210***	1.561
	[0.682]	[0.946]	[0.751]	[0.742]	[1.807]
Pre Issuance Years * Young Dummy	6.756***	8.798***	5.464***	5.735***	7.473***
	[1.840]	[0.812]	[0.512]	[0.896]	[1.908]
Issuance Year * Young Dummy	13.227***	5.520***	6.024***	8.501***	11.960***
	[1.724]	[0.853]	[1.121]	[1.810]	[2.255]
Post Issuance Years * Young Dummy	−4.987***	−2.620***	−0.578	−1.134	0.943
	[1.033]	[0.963]	[1.058]	[0.806]	[2.031]
No. of Observations	222,604	220,494	186,389	221,453	176,974
R-squared	0.297	0.280	0.212	0.216	0.138

B. Equity Issuers

	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	1.478***	1.362***	1.749***	2.593***	3.753***
	[0.431]	[0.426]	[0.451]	[0.507]	[0.963]
Issuance Year	9.568***	4.547***	3.519***	5.973***	8.256***
	[1.940]	[0.654]	[0.984]	[1.509]	[1.739]
Post Issuance Years	2.116***	1.811***	1.947***	3.113***	3.767***
	[0.344]	[0.381]	[0.271]	[0.528]	[1.131]
Young Dummy	2.276***	2.069**	1.500**	2.256***	2.159
	[0.618]	[0.955]	[0.629]	[0.636]	[1.754]
Pre Issuance Years * Young Dummy	7.912***	9.790***	5.728***	6.520***	7.247***
	[2.088]	[1.240]	[0.626]	[1.030]	[2.468]
Issuance Year * Young Dummy	13.577***	6.761***	6.288***	9.372***	13.632***
	[2.010]	[1.149]	[1.192]	[2.026]	[2.557]
Post Issuance Years * Young Dummy	−3.360***	−1.315	0.227	0.321	2.889
	[0.930]	[1.163]	[1.056]	[0.897]	[2.076]
No. of Observations	222,604	220,494	186,389	221,453	176,974
R-squared	0.295	0.280	0.211	0.215	0.137

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Table 5 (*continued*)

	C. Bond Issuers				
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	2.549***	1.789***	1.863***	2.917***	3.691***
	[0.398]	[0.380]	[0.446]	[0.541]	[0.679]
Issuance Year	5.731***	2.101***	2.419***	4.203***	7.395***
	[1.373]	[0.438]	[0.867]	[0.946]	[2.384]
Post Issuance Years	−0.592	−0.954	0.388	1.027	−0.063
	[1.021]	[0.644]	[0.566]	[0.616]	[1.475]
Young Dummy	5.878***	5.524***	4.013***	5.994***	7.068***
	[0.683]	[0.737]	[0.773]	[0.705]	[1.955]
Pre Issuance Years * Young Dummy	2.304**	2.651**	2.619***	3.250***	5.259*
	[0.970]	[1.190]	[0.807]	[0.836]	[3.029]
Issuance Year * Young Dummy	3.755**	−0.730	2.978**	0.888	4.040**
	[1.785]	[0.922]	[1.136]	[1.588]	[1.866]
Post Issuance Years * Young Dummy	−7.047***	−4.680***	−3.606***	−6.508***	−6.115***
	[1.595]	[0.668]	[0.478]	[1.215]	[1.837]
No. of Observations	222,604	220,494	186,389	221,453	176,974
R-squared	0.281	0.275	0.207	0.210	0.135

Table 6

Growth of high-r&d firms. This table reports difference-in-differences panel regressions of firm-level growth rates on issuance-window dummies for high- versus low-R&D firms. The estimations on firm-level growth rates have different dependent variables: total assets, sales, number of employees, property, plant, and equipment, and intangible assets. The regressions include three dummies to capture a five-year issuance window: a dummy for the issuance year, a dummy for the pre-issuance years equal to one for the two years preceding the issuance, and a dummy for the post-issuance years equal to one for the two years following the issuance. These dummies consider issuances that took place between 1991 and 2016. Interaction terms between these issuance dummies and a high-R&D-firm dummy are also included in the regressions. The high-R&D classification is at the industry level. All firms in a two-digit SIC industry code are classified as high-R&D firms if the median firm in that industry in the U.S. has a ratio of R&D to total investments greater than 0.6. The table considers three different definitions of issuing firms: both equity and bond issuers (capital market issuers) (Panel A), only equity issuers (Panel B), and only bond issuers (Panel C). For each definition, firms with no issuances are included in the regressions as part of the control group. All regressions include firm and country-year fixed effects as well as the firm-level controls described in Table 2. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Capital Market Issuers

	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	3.012***	4.006	2.968***	4.761***	5.844***
	[0.833]	[0.702]	[0.707]	[0.793]	[1.033]
Issuance Year	13.546***	5.252	5.028***	9.813***	10.595***
	[1.891]	[0.850]	[1.060]	[1.557]	[1.830]
Post Issuance Years	3.818***	2.585	2.550***	4.891***	4.358***
	[0.689]	[0.652]	[0.537]	[0.719]	[0.802]
Pre Issuance Years * High-R&D Dummy	−0.909	−0.161	0.381	−0.813	−0.954
	[0.589]	[0.438]	[0.511]	[0.620]	[0.794]
Issuance Year * High-R&D Dummy	5.142***	0.975	1.331***	−0.816	2.281***
	[1.465]	[0.518]	[0.391]	[1.261]	[1.121]
Post Issuance Years * High-R&D Dummy	−2.375***	−1.509	−0.024	0.843*	3.667***
	[0.878]	[0.632]	[0.370]	[0.447]	[0.929]
No. of Observations	527,408	515,157	380,910	521,941	374,548
R-squared	0.367	0.287	0.234	0.236	0.165

B. Equity Issuers

	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	1.454**	3.133***	2.229***	3.879***	4.701***
	[0.607]	[0.673]	[0.513]	[0.708]	[1.009]
Issuance Year	13.542***	4.982***	4.746***	9.517***	9.623***
	[2.016]	[0.924]	[0.939]	[1.620]	[1.697]
Post Issuance Years	3.659***	2.980***	2.656***	5.010***	4.560***
	[0.723]	[0.693]	[0.588]	[0.822]	[1.190]
Pre Issuance Years * High-R&D Dummy	−0.525	0.441	0.758	−0.506	−0.827
	[0.574]	[0.435]	[0.514]	[0.681]	[0.998]
Issuance Year * High-R&D Dummy	6.111***	1.583**	1.914***	−0.263	2.792**
	[1.662]	[0.722]	[0.488]	[1.539]	[1.379]
Post Issuance Years * High-R&D Dummy	−2.336**	−1.694**	0.152	1.128***	4.183***
	[0.953]	[0.686]	[0.405]	[0.410]	[1.103]
No. of Observations	527,408	515,157	380,910	521,941	374,548
R-squared	0.365	0.286	0.233	0.234	0.164

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Table 6 (*continued*)

	C. Bond Issuers				
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	6.288***	4.055***	3.360***	5.804***	7.049***
	[0.877]	[0.530]	[0.791]	[0.784]	[1.110]
Issuance Year	10.666***	4.896***	4.933***	8.361***	10.998***
	[1.917]	[0.824]	[1.271]	[1.326]	[2.383]
Post Issuance Years	3.493***	1.618***	1.441***	2.859***	2.291**
	[0.472]	[0.434]	[0.344]	[0.529]	[0.891]
Pre Issuance Years * High-R&D Dummy	−1.884***	−1.061	−0.318	−1.389*	−1.934*
	[0.693]	[0.740]	[0.314]	[0.730]	[0.970]
Issuance Year * High-R&D Dummy	0.423	−1.520**	−0.849*	−2.463***	0.898
	[0.935]	[0.641]	[0.493]	[0.791]	[1.600]
Post Issuance Years * High-R&D Dummy	−1.571**	−0.849*	−0.860**	−1.076	0.565
	[0.746]	[0.470]	[0.388]	[0.724]	[1.511]
No. of Observations	527,408	515,157	380,910	521,941	374,548
R-squared	0.355	0.285	0.231	0.232	0.163

Table 7
Country financial structure and firm composition. This table reports panel regressions of firm size, age, and R&D intensity on country-level financial structure and additional country-level controls. Financial structure is measured as the ratio of capital market to bank development. Firm size is the log of the value of the firm's total assets. Firms' R&D intensity is the log of the ratio of the firm's R&D over total investments. A detailed description of the control variables is included in Appendix Table 2. All regressions include year fixed effects. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	log(Size)			log(Age)			log(R&D Intensity)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Financial Structure	−0.230***	−0.198*	−0.195***	−0.146***	−0.170***	−0.117***	0.293***	0.206***	0.281***
	[0.070]	[0.113]	[0.070]	[0.037]	[0.040]	[0.022]	[0.071]	[0.053]	[0.075]
Trade		−0.001			−0.002			−0.004**	
		[0.002]			[0.001]			[0.002]	
Investment		0.025			−0.017			−0.037	
		[0.015]			[0.016]			[0.022]	
Years of Schooling		0.020	0.055		0.044	0.056**		−0.030	0.167**
		[0.173]	[0.107]		[0.050]	[0.027]		[0.198]	[0.079]
Log(GDP per capita)			0.508***			−0.026			0.543***
			[0.144]			[0.048]			[0.100]
GDP Growth			−0.107			−0.117***			0.142***
			[0.067]			[0.017]			[0.030]
Government Expenditure			−0.040			−0.023*			0.096
			[0.025]			[0.013]			[0.034]
Inflation Rate			−0.067**			0.002			−0.059
			[0.032]			[0.003]			[0.023]
Rule of Law			−1.302***			−0.097			0.132
			[0.328]			[0.091]			[0.174]
No. of Observations	543,355	543,355	424,462	321,506	321,506	224,506	173,868	173,868	142,147
R-squared	0.051	0.056	0.068	0.069	0.081	0.129	0.078	0.108	0.196

The rapid expansion of intangible assets by high-R&D firms following equity issuances is not reflected in an immediate increase in sales. This result could be related to the timing of the effects of investments. That is, relative to fixed capital investments, intangible investments might take a longer time to influence output and sales. The ultimate impact on production and sales is thus more uncertain. For example, consider a non-high-R&D firm that uses the funds raised in capital markets to buy machinery versus a high-R&D firm that uses them to finance research on new production processes. The non-high-R&D firm would be able to expand its production in the short term and, thus, increase sales. In contrast, investment in research by the high-R&D firm has a longer and more uncertain gestation period.

5. Heterogeneity across countries

The evidence presented in previous sections suggests that countries with relatively well-developed capital markets, especially stock markets, tend to provide greater financing to small, young, and high-R&D firms. In this section, we complement this evidence by studying the relationship between capital market development and the composition of firms in terms of size, age, and R&D intensity and then explore how the relationship between firm growth and capital market issuances differs across countries with different financial system structures. The analysis of the performance of firms across different countries is important because capital market development (equity and corporate bond market capitalization) differs markedly across countries, especially when contrasted with bank development (credit to the private sector). For example, China's capital market development is 0.50 times bank development, whereas this ratio is approximately 4.08 in the United States.

To assess the differences in firm composition across countries, we employ panel ordinary least squares regressions of firm size, age, and R&D intensity on countries' financial structures. The regression specification is as follows:

$$\log(Y_{isct}) = \gamma_0 + \gamma_1 FinStructure_{ct} + \gamma_2 \boldsymbol{X}_{ct} + \eta_t + \varepsilon_{isct}, \quad (4)$$

where Y_{isct} is either firm i's total assets, age, or R&D intensity. $FinStructure_{ct}$ is the ratio of country c's capital market development to bank development. $\boldsymbol{X}_{ct}$ is a vector of country-level controls. We consider two alternative sets of controls used in other studies. One set of controls includes the log of GDP per capita, the average rate of GDP growth during the sample period, the ratio of government expenditures to GDP, the inflation rate, and an index of rule of law, following Brown et al. (2013). The second set of controls includes the average years of secondary schooling attained, the ratio of trade to GDP, and the ratio of investment to GDP, following Brown et al. (2017). Lastly, η_t is a set of year-specific dummy variables accounting for shocks common to all countries in a given year. We cluster standard errors at the country level.

The results indicate that there is a strong relationship between the structure of a country's financial system and the composition of its listed firms (Table 7). The coefficient on $FinStructure_{ct}$ is statistically significant in all specifications, with a negative sign for firm size and age and a positive sign for firm R&D intensity. These estimates indicate that greater capital market development relative to bank development is associated with smaller, younger, and more R&D-intensive listed firms. The

Table 8
The role of financial structure. This table shows how the growth of capital market issuing firms varies depending on the country's financial structure. It reports difference-in-differences panel regressions of firm-level growth rates on issuance-window dummies (Panel A). The regressions also include interaction terms between the issuance window dummies and a variable at the country level measuring financial structure. The estimations on firm-level growth rates have different dependent variables: total assets, sales, number of employees, property, plant, and equipment, and intangible assets. The regressions include three dummies to capture a five-year issuance window: a dummy for the issuance year, a dummy for the pre-issuance years equal to one for the two years preceding the issuance, and a dummy for the post-issuance years equal to one for the two years following the issuance. These dummies consider issuances that took place between 1991 and 2016. Financial structure is measured as the ratio of capital market to bank development. Firms with no issuances are also included in the regressions as part of the control group. All regressions include firm and country-year fixed effects as well as the firm-level controls described in Table 2. This table also reports the estimated growth differential between issuers and non-issuers at the year of issuance for a selected group of countries (Panel B). Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Regression Analysis					
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	−1.671	2.440	1.680*	2.325*	3.498*
	[1.059]	[1.726]	[0.937]	[1.249]	[1.809]
Issuance Year	12.360**	2.441	2.618	5.385**	7.933**
	[4.978]	[1.683]	[1.761]	[2.375]	[3.618]
Post Issuance Years	3.309**	1.332	2.111***	5.057***	5.351***
	[1.331]	[1.104]	[0.776]	[1.747]	[1.876]
Pre Issuance Years * Financial Structure	2.098***	0.662	0.690***	0.891***	0.931*
	[0.263]	[0.458]	[0.208]	[0.289]	[0.484]
Issuance Year * Financial Structure	1.358	1.614***	1.400***	1.950***	1.934**
	[1.323]	[0.456]	[0.423]	[0.561]	[0.837]
Post Issuance Years * Financial Structure	−0.136	0.377	0.290	0.249	0.504
	[0.298]	[0.244]	[0.176]	[0.438]	[0.596]
No. of Observations	405,430	398,020	314,598	401,483	294,169
R-squared	0.393	0.308	0.250	0.266	0.177
B. Estimated Growth Differential between Issuers and Non-issuers for Selected Countries, Year of Issuance					
United States (*benchmark*)	17.900	9.026	8.330	13.341	15.823
Market-based					
Chile	15.117	5.718	5.461	9.344	11.860
Singapore	15.154	5.762	5.499	9.397	11.912
Bank-based					
China	13.034	3.243	3.313	6.353	8.893
Germany	13.470	3.760	3.762	6.979	9.513

results confirm the contrasting patterns of countries such as the United States (market-based) and China (bank-based). Listed firms in the United States are about 50 percent smaller and 187 percent more R&D intensive than those in China, where the median firm has US$242.66 million in assets and an R&D intensity of 0.25.

We next turn to the question: Does the relationship between a firm issuing securities and the change in its growth rate depend on the degree to which the economy has a more market- or bank-based financial system? To address this question, we augment the baseline specification (Equation (1)) and include interaction terms between financial structure and the issuance-window dummies. We estimate the following specification:

$$Growth_{isct} = \gamma_0 + \gamma_1 PreIss_{isct} + \gamma_2 Issuance_{isct} + \gamma_3 PostIss_{isct} + \gamma_4 (PreIss_{isct} * FinStructure_{ct}) + \gamma_5 (Issuance_{isct} * FinStructure_{ct}) + \gamma_6 (PostIss_{isct} * FinStructure_{ct}) + \boldsymbol{X}_{isct} + \delta_i + \omega_{ct} + \varepsilon_{isct}. \quad (5)$$

We find that capital market issuances are associated with faster growth among issuing firms located in countries with greater capital market development relative to bank development (Table 8). The estimates of γ_5 are positive and statistically significant across all measures of firm growth, except for total assets. To evaluate the magnitude of this coefficient, we compare the difference in predicted growth for issuing firms in countries with market-based financial systems (such as the United States) vis-à-vis countries with bank-based financial systems (such as Germany and China). For example, the estimates for the year of issuance imply that issuing firms in Germany grow on average 3.76 percentage points faster than non-issuers in terms of employment. This growth differential is 4.57 percentage points smaller than that in the United States, which is an economically sizable difference given that employment growth for the average firm in the sample stood at 4.48 percent. In the case of China, the growth differential in employment between issuers and non-issuers is 5.02 percentage points smaller than that in the United States. Even within market-based countries, there could be sizable growth differentials. For example, the growth differential between issuers and non-issuers is 2.87 percentage points smaller in Chile than in the United States.

6. Changes in growth opportunities

The joint findings that issuers grow faster than non-issuers before the issuance of securities and that this growth differential significantly widens as firms issue securities are consistent with issuers witnessing growth opportunities, and using

Table 9
Probability of issuance and industry prices. This table reports logit estimates analyzing the firm's issuance decision as a function of aggregate industry prices. The dependent variables are: a dummy that equals one if a firm issued either equity or bonds in a given year (columns 1–4); a dummy that equals one if a firm issued only equity in a given year (column 5); and a dummy that equals one if a firm issued only bonds in a given year (column 6). The main independent variables are: the mining price index calculated as a weighted average of 18 commodity prices, a dummy that equals one if a firm belongs to the mining industry, and the interaction between the two. The regressions also control for global economic and financial factors that might affect a firm's decision to issue in capital markets. These global factors include a country's consumer price index, GDP growth, the CBOE volatility index (VIX), the yield on 10-year U.S. treasury securities, and the Global Dow Index that is composed of 150 blue-chip stocks of corporations from around the world. All the independent variables are lagged one year. Regressions reported in columns (3)-(6) also control for four-digit SIC industry and country fixed effects. Column (4) shows a robustness exercise consisting on the exclusion of firms from the oil and gas industry (SIC 13) from the sample. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	Capital Market Issuance Dummy				Equity Issuance Dummy	Bond Issuance Dummy
	(1)	(2)	(3)	(4)	(5)	(6)
Mining Price Index	0.003	0.001	0.001	0.000	0.001	−0.002
	[0.002]	[0.001]	[0.001]	[0.001]	[0.002]	[0.001]
Mining Dummy	−0.225	−0.226	−0.300	−0.569	−0.028	−1.804**
	[0.180]	[0.169]	[0.269]	[0.348]	[0.445]	[0.721]
Mining Price Index * Mining Dummy	0.012***	0.012***	0.012***	0.015***	0.012***	0.010***
	[0.002]	[0.002]	[0.002]	[0.003]	[0.002]	[0.001]
Consumer Price Index		0.008***	0.008	0.007	0.004	0.013**
		[0.003]	[0.006]	[0.006]	[0.006]	[0.005]
GDP Growth		−0.020	−0.013	−0.013	−0.016	−0.015
		[0.015]	[0.021]	[0.022]	[0.016]	[0.029]
VIX		−0.015**	−0.015**	−0.016**	−0.009	−0.022
		[0.006]	[0.007]	[0.007]	[0.007]	[0.015]
U.S. 10 Yr Treasury Constant Maturity Rate		−0.016	−0.027	−0.032	−0.022	−0.006
		[0.042]	[0.042]	[0.042]	[0.043]	[0.071]
Global Dow Index		−0.001	−0.001	−0.001	−0.001	
		[0.001]	[0.001]	[0.001]	[0.001]	
Constant	−2.560***	−2.415***	−2.375***	−2.235***	−2.943***	−3.810***
	[0.180]	[0.347]	[0.686]	[0.689]	[1.012]	[1.002]
Country Fixed Effects	No	No	Yes	Yes	Yes	Yes
Industry Fixed Effects	No	No	Yes	Yes	Yes	Yes
No. of Observations	1,844,175	1,759,357	1,759,285	1,681,611	1,758,637	1,827,278

the funds raised through securities issuances to realize those growth opportunities. One concern with interpreting the findings in this way, however, is that we cannot observe growth opportunities at the firm level. We just find behavior compatible with firms issuing securities to realize growth opportunities.

To shed further light on this issue, we study the impact of exogenous changes to the growth opportunities of one industry—mining—on issuing activity. To conduct this evaluation, we use changes in mining prices in international markets as an exogenous source of variation in growth opportunities. The basic idea is that changes in mining prices shape the growth opportunities for firms in that industry. Other papers have exploited a similar idea to study exogenous changes to international commodity prices and their effects on the banking system (Agarwal et al., 2017, 2020).

We use logit regressions to assess the relationship between securities issuances and mining prices. Specifically, the dependent variable is a dummy variable of whether the firm issues a security ($Issuance_{isct}$). The main explanatory variables are (1) the mining price index ($MiningPrice_t$), which is calculated as a weighted average of 18 mining commodity prices, (2) a dummy that equals one if a firm belongs to the mining industry ($MiningDummy_s$), and (3) the interaction between the two.[25] As controls, the regressions include one-year lagged values of the consumer price index to capture general output prices, GDP growth to capture overall demand ($\boldsymbol{X}_{ct}$), and the VIX volatility index, the U.S. Treasury rate, and the Global Dow Index to capture overall market conditions for firm financing ($\boldsymbol{Y}_t$). Some specifications also control for country and industry fixed effects (at the four-digit SIC level).[26] The regression specification is as follows:

$$Issuance_{isct} = \gamma_0 + \gamma_1 MiningPrice_t + \gamma_2 MiningDummy_s + (MiningPrice_t * MiningDummy_s) + \boldsymbol{X}_{ct} + \boldsymbol{Y}_t + \eta_s + \alpha_c + \varepsilon_{isct} \quad (6)$$

The results suggest that mining companies are more likely to issue whenever the prices of the mining industry increase (Table 9). This holds across specifications with similar point estimates. Issuances of firms in other industries do not appear to respond to mining prices. In other words, fluctuations in mining prices do not reflect an aggregate shock that prompts output

[25] The mining price index is constructed as a weighted average of the prices of aluminum, chloride, coal, cobalt, copper, gas, gold, iron, lead, nickel, oil, palladium, platinum, potassium phosphate rock, silver, tin, uranium, and zinc. The weights are calculated based on the commodity's global import share over the period 2014–16. Prices are normalized to 100 in 2010.

[26] We estimate these regressions for both equity and bond issuances together, and separately.

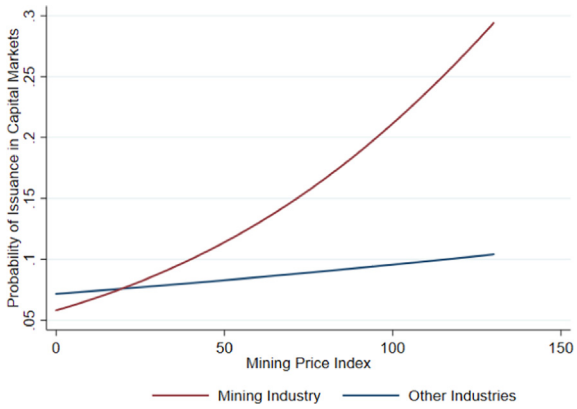

Fig. 3. Probability of issuance and industry prices. This figure shows the estimated probability of issuance in capital markets for firms in the mining industry (red) and the rest (blue) as a function of the mining price index. The estimated probability of issuance corresponds to the marginal effects implied by the logit regression reported in column 1 of Table 9. The mining price index is a weighted average of 18 commodity prices. The weight is calculated based on the commodity's global import share over the period 2014–16.

prices and issuances to increase for all industries. The marginal effects of those estimations show that, for example, when the mining price index goes from 50 to 100, the probability of issuance for mining firms jumps from 11 percent to 21 percent (Fig. 3). That is, aside from any effect that global financial conditions might have on the probability of issuance, these results suggest that higher output prices induce firms to issue more equity and bonds.

7. Conclusions

The debate about the link between finance and growth has occupied economists for a long time. Most of this debate has focused on country-level evidence that shows a positive link between financial sector development and national growth. Using data for firms from around the world, we contribute to this debate by studying whether the link also exists at the firm level.

There are four key findings in this paper. First, firms experience a boost in sales and asset growth and an increase in productive capabilities—tangible assets, intangible assets, and employment—when raising funds in capital markets. These findings indicate that firms are not using the new funds just to change their capital structure or increase financial investments. Second, firms that are ex ante more likely to be financially constrained—small, young, and high-R&D firms—experience a larger boost in growth around issuance. These findings suggest that capital markets can allow financially constrained firms to relax their funding restrictions and grow. Furthermore, equity (but not bond) issuances have an especially strong, positive link with intangible investments by high-R&D firms. This finding contributes to research on the question of whether equity markets have a comparative advantage in funding more opaque investments. Third, countries with greater capital market development have a higher proportion of smaller, younger, and innovative listed firms than more bank-based countries. Furthermore, firms in countries with relatively well-developed capital markets experience a larger boost in growth when issuing securities than firms in bank-based financial systems. These findings contribute to research on debates concerning the connections between financial architecture and financing of different types of firms and activities. Fourth, firms that experience exogenous changes in growth opportunities are more likely to issue securities in capital markets. This result suggests that firms use capital markets to realize growth opportunities by expanding their productive capabilities.

The positive association between firms issuing securities and firm growth sheds new light on the debates concerning the mechanisms through which capital markets might influence growth. The evidence in this paper suggests that it is not just that firms grow faster in countries with better functioning capital markets. Rather, we find that issuers (especially smaller, younger, and higher-R&D intensive ones) grow faster than non-issuers as they raise capital, after controlling for different effects. This evidence does not reject theories that predict that firms do not need to sell securities to reap the benefits of better capital markets, but it does establish that there is a strong positive relationship between issuance and firm growth across a wide array of countries. Future research would need to identify the degree to which supply-side factors (such as shocks that relax financing constraints) drive the positive association between capital raising and firm growth, and how much demand-side factors (such as high growth opportunities) prompt firms to tap capital markets. Moreover, because some of the benefits of more developed capital markets are directly accrued by only some firms, further research could study the possible benefits to other firms that do not raise funds in these markets.

The fact that issuers grow faster than non-issuers might have consequences for the firm size distribution. Issuers will become larger over time, so the firm size distribution would tend to widen. But among issuers, smaller firms grow faster than larger firms. So smaller firms might catch up with larger firms. This might have consequences for the amount of financing

that issuers receive as they become larger, as well as their preponderance in the overall economic activity across countries. Understanding these distributional effects across firms has gained attention and will remain a subject of intense scrutiny in future research.

Appendix A

See Fig. A1 and Tables A1-A3.

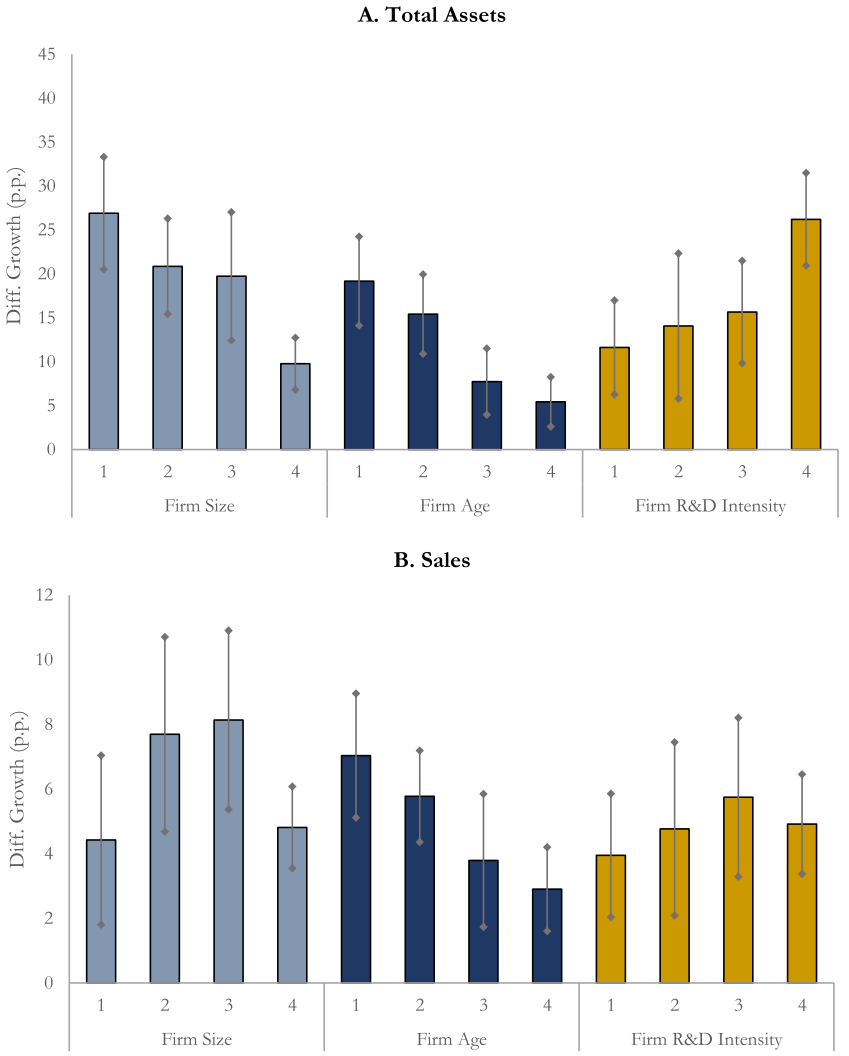

Fig. A1. Heterogeneity across firms, quartile estimates. This figure shows the estimated annual growth rate differential between issuers and non-issuers at the year of issuance for each of the four quartiles of the distributions of firm size, age, and R&D intensity. Growth differentials are measured for five variables, each of which is shown in a different panel: total assets, sales, number of employees, property, plant, and equipment, and intangible assets. The statistics shown in this figure are obtained from the estimation of quantile regressions using the specification described in Table 2 for each quartile of the distribution. The vertical lines show the confidence interval around these estimates at the 95% statistical confidence level. Firm size is measured as the log of total assets and R&D intensity as the log of the R&D-to-total investment ratio. Firms are assigned into each quartile based on their median size, age, and R&D intensity over the sample period.

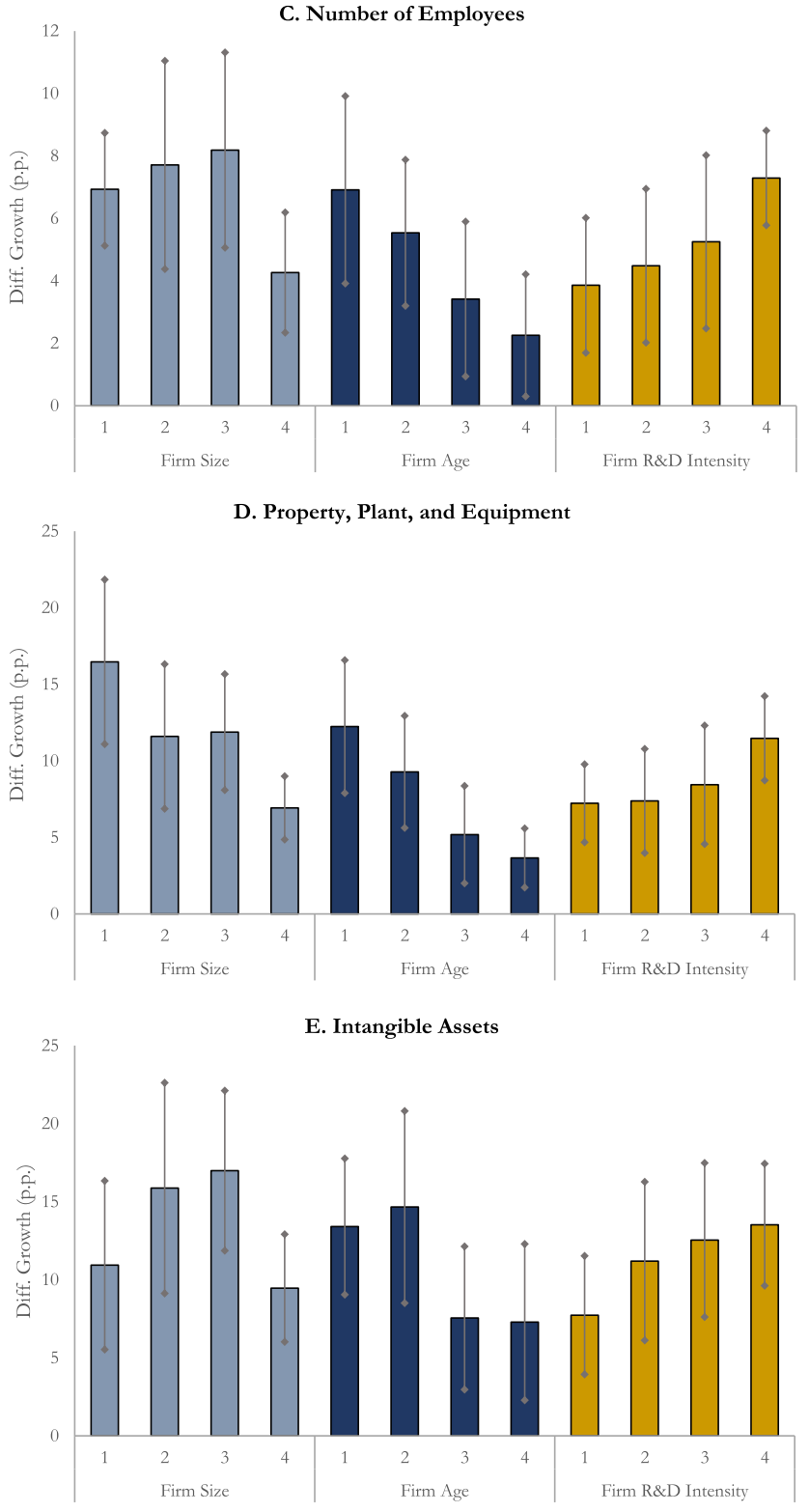

Fig. A1 (*continued*)

Table A1
Country coverage. This table reports the number of capital market issuing and non-issuing firms for each country in the sample. Issuing firms are those with at least one equity or bond issuance between 1991 and 2016. Non-issuing firms are all the other firms in the sample.

Country	Number of Listed Firms			Country	Number of Listed Firms		
	Total	Issuers	Non-issuers		Total	Issuers	Non-issuers
Argentina	127	91	36	Morocco	60	37	23
Australia	2,608	2,413	195	Netherlands	352	252	100
Austria	162	97	65	New Zealand	224	174	50
Belgium	216	138	78	Nigeria	90	19	71
Brazil	553	357	196	Norway	427	293	134
Bulgaria	210	20	190	Oman	98	46	52
Canada	4,275	3,821	454	Pakistan	294	111	183
Chile	243	157	86	Peru	161	60	101
China	4,462	3,961	501	Philippines	216	167	49
Colombia	93	49	44	Poland	566	372	194
Croatia	102	17	85	Portugal	122	78	44
Denmark	265	159	106	Qatar	26	19	7
Egypt	170	108	62	Republic of Korea	2,254	1,994	260
Finland	224	157	67	Romania	147	18	129
France	1,514	1,042	472	Russian Federation	775	208	567
Germany	1,308	844	464	Saudi Arabia	132	85	47
Greece	386	203	183	Singapore	853	762	91
Hong Kong SAR, China	1,449	1,287	162	South Africa	680	175	505
Hungary	61	22	39	Spain	277	167	110
India	3,026	2,107	919	Sri Lanka	184	79	105
Indonesia	482	410	72	Sweden	866	561	305
Ireland	179	137	42	Switzerland	364	236	128
Israel	567	270	297	Taiwan, China	2,206	1,466	740
Italy	467	343	124	Thailand	678	567	111
Japan	4,911	4,047	864	Tunisia	53	37	16
Jordan	137	62	75	Turkey	348	176	172
Kazakhstan	38	10	28	Ukraine	114	10	104
Kenya	43	11	32	United Arab Emirates	66	38	28
Kuwait	105	42	63	United Kingdom	3,670	2,715	955
Lithuania	40	13	27	United States	15,596	10,315	5,281
Luxembourg	80	57	23	Venezuela	28	25	3
Malaysia	1,223	1,084	139	Vietnam	787	350	437
Mexico	213	158	55				

Table A2
Data description. This table provides a detailed description of the variables used in the analyes reported in the paper.

Variable	Source	Description
Current Ratio	Worldscope	Ratio of current assets to current liabilities. Current assets represent cash and other assets that are reasonably expected to be realized in cash, sold, or consumed within one year or one operating cycle. Current liabilities represent debt or other obligations that the company expects to satisfy within one year.
Financial Structure	World Bank Financial Structure Database	Financial structure is measured as the ratio of capital market development to bank development. Capital market development is the sum of stock market capitalization and private bond market capitalization. Bank development is measured as deposit money bank credit to the private sector.
GDP Growth	IMF World Economic Outlook Database	Average growth rate of GDP during the sample period. Prior to the calculation of the growth rate, the GDP has been adjusted for inflation using 2011 prices.
GDP per Capita	IMF World Economic Outlook Database	GDP expressed in U.S. dollars per person. Adjusted for inflation using 2011 prices.
Global Dow Index	Refinitiv	The Global Dow Index is a 150-stock index of leading blue chip companies from around the world. The index includes companies with a long history of success and a wide following among investors. The index is equal-weighted and includes companies from developed and emerging economies.
Inflation Rate	World Bank Development Indicators	Inflation as measured by the consumer price index. It reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.

(*continued on next page*)

Table A2 (*continued*)

Variable	Source	Description
Intangible Assets	Worldscope	Assets that do not have a physical existence and whose value lies in their expected future return. This includes goodwill, patents, copyrights, trademarks, software development, and customer lists, among others.
Interest Coverage Ratio (ICR)	Worldscope	Ratio of operating income to interest expense on debt. Operating income represents the difference between sales and total operating expenses. Interest expense on debt represents the service charge for the use of capital before the reduction for interest capitalized.
Investment	World Bank Development Indicators	Gross fixed capital formation as a share of GDP. It includes land improvements (fences, ditches, drains); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.
Leverage	Worldscope	Ratio of total debt over total assets. Total debt represents all interest bearing and capitalized lease obligations. It is the sum of long and short term debt.
Mining Price Index	World Bank Commodity Price Data, IMF Primary Commodity Price Data	The mining price index is constructed as a weighted average of 18 commodity prices: iron, copper, zinc, lead, gold, silver, nickel, cobalt, uranium, aluminum, tin, platinum, palladium, coal, oil, gas, potassium chloride, and phosphate rock. The weights are calculated based on the commodity's global import share over the period 2014–16. Prices are normalized to 100 at year 2010.
Number of Employees	Worldscope	The number of both full and part time employees of the company.
Profitability	Worldscope	Ratio of earnings before interest, taxes, and depreciation (EBITDA) to total assets. EBITDA represents the earnings of company before interest expense, income taxes, and depreciation. It is calculated by taking the pre-tax income and adding back interest expense on debt and depreciation, depletion and amortization, and subtracting interest capitalized.
Property, Plant, and Equipment	Worldscope	Tangible assets with an expected useful life of over one year which are expected to be used to produce goods for sale or for distribution of services (gross property, plant and equipment) less accumulated reserves for depreciation, depletion, and amortization.
Rule of Law	Worldwide Governance Indicators	Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. This variable gives the country's score on the aggregate indicator, in units of a standard normal distribution. It ranges from approximately −2.5 to 2.5, where higher is better.
Sales	Worldscope	Gross sales and other operating revenue less discounts, returns and allowances.
Total Assets	Worldscope	Sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property, plant, and equipment, and other assets.
Trade	World Bank Development Indicators	Trade is the sum of exports and imports of goods and services measured as a share of GDP.
Turnover	Worldscope	Ratio of net sales to total assets. Net sales represent gross sales and other operating revenue less discounts, returns, and allowances.
U.S. 10 Yr Treasury Constant Maturity Rate	Federal Reserve Bank of St. Louis	Index based on the average yield of a range of U.S. Treasury securities with 10-year maturity. Constant maturity yields are used as a reference for pricing debt securities issued by entities such as corporations and institutions (e.g., corporate bonds).
VIX	Federal Reserve Bank of St. Louis	Chicago Board Options Exchange market volatility index. The VIX index is a measure of 30-day expected volatility of the U.S. stock market, derived from real-time, mid-quote prices of S&P 500 Index call and put options.
Years of Schooling	World Bank Development Indicators	Average years of secondary schooling attained.

Table A3

Capital market financing and firm growth: the effect of debt overhang. This table reports difference-in-differences panel regressions of firm-level growth rates on issuance-window dummies. The estimations on firm-level growth rates have different dependent variables: total assets; sales; number of employees; property, plant, and equipment; and intangible assets. The issuance window dummies capture a five-year window around capital raising issuances that took place between 1991 and 2016. Three dummies are included in the regressions: a dummy for the issuance year, a dummy for the pre-issuance years equal to one for the two years preceding the issuance, and a dummy for the post-issuance years equal to one for the two years following the issuance. The table considers three different definitions of issuing firms: both equity and bond issuers (capital market issuers) (Panel A), only equity issuers (Panel B), and only bond issuers (Panel C). For each definition, firms with no issuances are included in the regressions as part of the control group. All regressions include the lagged value of the debt overhang dummy. This dummy is equal to one for firms whose debt-to-assets ratio is equal to or greater than 0.8. All regressions include firm and country-year fixed effects as well as firm-level controls. The table reports Wald tests on the differences between the coefficients of the pre-issuance and issuance dummies. Standard errors, shown in brackets, are clustered at the country level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Capital Market Issuers					
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	2.622***	3.919***	3.103***	4.427***	5.432***
	[0.866]	[0.645]	[0.560]	[0.704]	[0.879]
Issuance Year	15.479***	5.602***	5.541***	9.472***	11.508***
	[2.160]	[0.877]	[1.076]	[1.485]	[1.859]
Post Issuance Years	2.859***	1.973***	2.521***	5.185***	5.861***
	[0.630]	[0.555]	[0.454]	[0.765]	[0.745]
Debt Overhang	−4.660***	−6.503***	−3.458***	−8.507***	−1.737
	[1.752]	[2.159]	[0.886]	[1.199]	[2.070]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.367	0.287	0.234	0.236	0.165
Wald Test:					
Issuance vs. Pre Issuance Years	12.857***	1.683***	2.438***	5.045***	6.075***
B. Equity Issuers					
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	1.213*	3.280***	2.521***	3.665***	4.353***
	[0.621]	[0.625]	[0.421]	[0.604]	[0.893]
Issuance Year	15.908***	5.577***	5.522***	9.381***	10.790***
	[2.175]	[0.946]	[0.945]	[1.478]	[1.783]
Post Issuance Years	2.706***	2.282***	2.692***	5.393***	6.278***
	[0.701]	[0.591]	[0.498]	[0.823]	[0.984]
Debt Overhang	−4.818***	−6.600***	−3.518***	−8.611***	−2.012
	[1.760]	[2.190]	[0.900]	[1.172]	[2.041]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.364	0.286	0.233	0.235	0.164
Wald Test:					
Issuance vs. Pre Issuance Years	14.694***	2.297***	3.001***	5.716***	6.437***
C. Bond Issuers					
	Total Assets	*Sales*	*Number of Employees*	*Property, Plant, and Equipment*	*Intangible Assets*
Pre Issuance Years	5.662***	3.699***	3.248***	5.337***	6.359***
	[0.907]	[0.594]	[0.719]	[0.806]	[0.969]
Issuance Year	10.795***	4.428***	4.669***	7.604***	11.291***
	[2.068]	[0.761]	[1.252]	[1.296]	[2.498]
Post Issuance Years	3.025***	1.372***	1.178***	2.559***	2.485***
	[0.460]	[0.353]	[0.266]	[0.537]	[0.711]
Debt Overhang	−5.158***	−6.775***	−3.663***	−8.984***	−2.324
	[1.847]	[2.219]	[0.950]	[1.149]	[1.979]
No. of Observations	527,436	515,185	380,920	521,969	374,562
R-squared	0.355	0.285	0.231	0.232	0.163
Wald Test:					
Issuance vs. Pre Issuance Years	5.133***	0.729	1.421**	2.268***	4.932**

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