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Financial markets and the financing choice of firms: Evidence from developing countries

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Abstract

We study the role of financial market development in the financing choice of firms in developing countries using a dynamic panel approach with aggregate firm-level data. The results suggest that equity market development favors firms' equity financing over debt financing, while banking sector development favors debt financing over equity financing, as one would expect. However, surprisingly, equity markets exhibit somewhat stronger influence in the *short run* than they do over the *long run*. Results from the dynamic panel model show that if *both* elements of the financial sector develop simultaneously, the long-run debt–equity ratio, while rising, will *converge* to a stable value.

JEL classification: G15; G20
Keywords: Financial markets; Financing choice of firms; Panel data

1. Introduction

How do firms in developing countries choose between debt and equity? What role do domestic and international capital markets play in this choice? Is this choice influenced by the level of development of the stock market in a country?[1] These questions have become

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[1] For example, the International Financial Corporation's bulletin shows that the number of firms listed in emerging markets grew from under 7000 in 1983 to over 13,000 in 1992, or by nearly 8% annually.

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increasingly important, given the rapid growth of the stock markets in the developing world over the past 20 years and especially in the 1990s. Although this growth has somewhat slowed in recent years, developing countries' stock markets now command a much more central role than they did a decade ago, thanks to trade and financial liberalization in these countries over the past decade.

The question of the financing choice of firms is critical in this regard because the cost of capital and hence, the value of a firm, depends upon its debt–equity mix (cf. Boyd & Smith, 1998; Hovakimian, Opler, & Titman, 2001; Pagano, 1993). However, important differences seem to exist between the developed and developing countries in this regard. For example, Atkin and Glen (1992) find that for firms in the G7 countries, internally generated funds were dominant, while for firms in developing countries, externally generated funds, i.e., bank loans and equity, were more important.[2] Despite the increasing importance of external finance in developing countries, achieving the optimum capital structure for firms in developing countries presents additional complications because of market inefficiencies and institutional constraints. For example, developing country banks cannot adequately provide the resources to firms in these countries, especially where government credit demands crowds out the private sector, or where the macroeconomic environment is too risky for long-term loans.[3] While financial liberalization has broadened the range of financial instruments available to developing country firms, taking advantage of this wider range imposes new and difficult challenges (cf. Domowitz, Glen, & Madhavan, 2000).

Surprisingly, few systematic empirical studies exist on the impact of stock markets and banks, on the financing choice of firms in the developing world. This is a gap to which this paper is addressed. Using data for 21 developing countries for a period of 18 years, we adopt a panel framework to study this question. Our approach further contributes to the understanding of this issue by using *panel* data and especially by adopting a *dynamic* panel data methodology over existing cross-sectional approaches. Finally, some data quality and heterogeneity questions in the previous studies are addressed as well.

In what follows, Section 2 reviews the literature, with a subsection related to our contribution; Section 3 discusses the data, measurement and variable definitions; Section 4 outlines the empirical model and presents results and Section 5 presents concluding remarks.

2. Review of recent studies and our contribution

Spurred by Modigliani and Miller's (1958) argument that in an ideal world without taxes, whereby a firm's value is independent of its debt–equity mix, economists have

[2] For example, as a fraction of total finance, internally generated finance was found to be between 12% and 58% in the developing countries, but between 52% and 100% in the G7 nations (Atkin & Glen, 1992).

[3] Samuel (1996) shows that in India, 40% of every rupee deposited in the banking system must be held as reserves (of one form or another); directed credit accounts for another 24%, leaving banks only 36% of deposit to lend freely. In transition economies, such as Poland, the main complaint of private entrepreneurs is the banks' unwillingness to lend, partly because these entrepreneurs do not have prior track records and partly because state banks are more accustomed to dealing with state companies.

sought conditions under which financial structure *would* matter. Economic theory suggests that several factors influence the debt–equity mix: differential taxation of income from different sources, informational asymmetries, bankruptcy costs/risks, issues of control and dilution, and the agency problem (i.e., differences in the objectives of managers and shareholders).[4]

First, taxation would bias the financing choice towards debt if, for example, corporate income is taxed but interest payments are tax deductible.[5] Second, informational asymmetries lead to different perceptions of risk. If investors perceive the risk to be higher than managers, then cost of external finance via debt is higher than that of internal finance via retained earnings. Third, if firms accumulate more debt, say via the differential taxation mechanism described, then their ability to meet fixed interest payments from current earnings diminishes. This increases the probability (risk) of bankruptcy and, as a result, the *cost* of both debt and equity. Firms that adjust their capital structure away from excessive debt reduce the risk exposure of debt–equity mix, and thus lower their cost of finance. Fourth, in emerging markets with strong family ownership ties, the issue of *control* may play a larger role, causing firms to defer issuing equity to avoid diluting control.[6] The effect is somewhat similar to that of the *agency* problem associated with management "perks," discussed in the finance literature (see Hart, 2001).

An important concept in all of this is what is called the *target* debt level. In theory, firms should issue equity, if debt level is above a target level, and debt otherwise. With no flotation (or commitment) costs, such adjustments can be instantaneous and continuous. In practice, however, the existence of significant flotation costs implies fluctuation of the debt–equity ratios around their target level, over time. Clearly any empirical work needs to identify this target level and how it might change due to exogenous shocks. However, because the target level is unobserved, one can study its *past* behavior. Our use of the panel dynamic methodology in this paper allows us to study the target debt–equity ratio in this way.

Besides these explanations, what does theory suggest about the role of economic development and *growth* in the financing choice of firms? An important paper in this regard is by Boyd and Smith (1998) who developed a model where capital accumulation is financed by both debt and equity. Investments require external financing, but are subject to Costly State Verification (CSV). Investors have access to two investment technologies: one with a return that is only privately observable (debt), and the other with a publicly observable return (equity). The authors find that, along the growth path, as the relative price of capital falls, verification is more difficult and CSV will rise. As a result, investors employ the observable technology more intensively. Hence, as the

[4] Two useful surveys of these issues are found in Harris and Raviv (1991) and more recently in Hart (2001).

[5] MacKie-Mason (1990) shows that this effect is significant.

[6] Related to control is the issue of disclosure. Public listing of equity entails the disclosure of information that closely held firms prefer to keep private. Ritter (1987) presents evidence on two quantifiable components of going public: direct costs and underpinning. Together, these costs average 21.22% of the realized market value of securities issued for "firm commitments" offer and 31.87% for "best efforts" offers.

economy grows, an increase in equity financing and a fall in the debt–equity ratio would be expected.

Ramamurti and Vernon (1991) show significant variations in capital structures among emerging market economy firms. For example, equity financing seems to be high in Brazil (with 2/3 equity financing) and Malaysia, but low in India and Pakistan (with 1/3 equity financing). What explains these variations? Samuel (1996) suggests that variations in the debt–equity mix depend on the macroeconomic environment as well as on controls and interventions in domestic capital markets. Thus, there may be a predisposition toward debt when interest rates are controlled and the real after-tax cost of debt is negative (India through the 1980s); high inflation and the associated uncertainty may create a scarcity of long-term instruments, forcing reliance on equity (Brazil); and high growth and interest in emerging markets may create incentives for firms to issue equity (Malaysia; see Ramamurti & Vernon, 1991).

Although differences in financial systems have been noted in the literature, only a few studies have attempted to formally model the effect of financial market development on firm's financing choices. These are Pagano's (1993) model of the effect of opportunities for diversification on portfolio choice, Bencivenga, Smith, and Starr's (1996) analysis of the effect of financial liquidity on technology choice, and Boyd and Smith's (1996) analysis of debt versus equity financing for capital investments. The empirical work in this area is also sparse, limited largely to a study by Titman and Wessels (1988) on debt–equity ratios in the United States, and another one by Rajan and Zingales (1998) on a sample of industrial countries. Moreover, none of these studies investigates the emerging market corporate finance and the increasingly important role of stock market development in it.

2.1. Contribution of this study

A few recent studies have considered the debate on debt–equity financing and economic development.[7] One such study by Demirguc-Kunt and Maksimovic (1996) empirically explores the effect of the financial markets, and particularly stock market development, on the financing choice of firms. While Demirguc-Kunt and Maksimovic's attempt to include developing countries is laudable, the study's use of banking variables (assets and liabilities) as an aggregate measure of firm's leverage in its regressions is somewhat questionable. For example, a change in the banking variable may result from exogenous changes in the macroeconomic environment (e.g., monetary policy), independent of firms' leverage. In this paper, we use a separate and *direct* measure of firm leverage, obtained from the corporate finance data set of International Finance Corporation (IFC) and WorldScope. This allows us to distinguish between banking variable and leverage, enabling us to study the role of banking development, alongside that of the stock market, on the firms' financing choice. Additionally, these data allow us to distinguish between the long-run and short-run

[7] See a World Bank seminar on these issues on the following website: http://www.worldbank.org/research/projects/finstructure/papers_22000.htm.

financing choice of firms, a distinction that turns out to be interesting and significant in our results.

Demirguc-Kunt and Maksimovic's study also does not consider country-specific effects. Such effects include both the traditional country-specific factors that may be present, as well as effects related to the data itself.[8] By using panel approach, we address this issue. Finally, Demirguc-Kunt and Maksimovic's measures are averaged over the 1980–1991 period. Averaging over long periods is problematic as many changes occur simultaneously that are ignored. For example, policy regimes undergo basic changes, economies experience business cycles, and governments rise and fall. Aggregation over time may blur important events and differences across countries.

Another study by Domowitz et al. (2000) uses data from 1980 to 1997 to construct four leverage ratios as opposed to two that were used in the previous studies. However, their paper does not provide direct statistical tests of the links between the nature (and level) of financial intermediary and the firms' financing decisions.

In this paper, we reexamine the financing choice of firms by focusing on the determinants of the debt–equity ratios of firms in 21 developing countries for a period of 18 years (1980–1997) within a panel dynamic framework. Panel data has several advantages. First, it allows us to test for whether variations in the dependent variables across countries are country specific (fixed effects), or random. Second, because we do not average over time, we have a much larger number of observations, increasing the degree of freedom and improving the efficiency of the estimates. Finally, by adopting a *dynamic* panel methodology we address such interesting dynamic questions as whether there is stable debt–equity ratio to which firms converge over time, as proposed, for example, by Rajan and Zingales (1998).

Our findings confirm some of the previous studies and contradict others. First, we find that stock market development *reduces* leverage in favor of equity, while banking variable increases it. This finding on stock market–leverage linkage is at odds with the Demirguc-Kunt and Maksimovic's (1996) study, in which it is found that, at least for larger firms, developing stock markets lead to increased leverage. Although differences in method (our panel versus their cross-country method) or that of the timing of the data (our 1980–1997 versus their 1980–1991) could account for this, it is most likely that their use of banking variable as a measure of leverage, rather than developing a direct measure of leverage, as we do, is responsible for this.[9]

Our findings do confirm the results of the study by Rajan and Zingales (1998) on the stability of the debt–equity ratios, which is possible by our use of panel dynamics. Finally, given the globalization of capital markets in the recent past, the role of capital inflow is also investigated. Razin, Sadka, and Yuen (1998) have argued that both external debt and equity flows are more likely to take place in a more open economy than a closed one. Using foreign direct investments (FDIs) as a measure of capital inflows, we find that such

[8] For example, data for developing and developed countries are collected from different country sources, implying variations in the definition, collection procedure, and measurement of the variables.

[9] To account for any endogeneity of our banking variables, we also estimated the impact of stock market variables (lagged for one and two periods) on banking variables. However, after controlling for the fixed effects, no statistically significant impact was found.

inflows improve the debt–equity ratio (reduce it) over the short run, but surprisingly have no significant effects on this ratio in the long run.

3. Data and variable description

Our sample data consists of 21 developing countries from 1980 to 1997. These countries were chosen because they have an emerging stock market and because data on individual firms' financial structure are available for a sufficiently large number of firms (see Appendix A for a list of the countries and the number of firms within each country). Rather than using firm-level data, we aggregate over the firms in each country to smooth over cross-firm variances that are due to idiosyncratic factors unrelated to the model; for example, firms belonging to different industries in each country, or being at different stages of their expansion (and thus at different stages in their need for raising capital), and so forth. This smoothing (or averaging) across firms is done so that we can examine the behavior of a *representative* firm in a country, following the theoretical discussion earlier.

A complete list of the countries and some descriptive statistics for the variables used as part of the study are provided in Table 1. They are as follows:

Long-term debt/equity and short-term debt/equity: Data on both long-term and short-term debt–equity ratio for individual firms for all the countries were provided from the corporate finance database of the IFC and WorldScope. It consists of financial data on the largest firms trading on the stock exchanges of these countries. Although this data is, in principle, available at the industry level, a close study of the data reveals that it is not possible to conduct a study at the industry level. This is because there may be only a few firms in a given industry for a particular country, and no data on that industry for another country. These differences are largely due to the fact that in most of these countries, import and export compositions are very dissimilar. Thus, to avoid differences across firms, we have aggregated the data for all firms in a given country for a particular year. Because the database also provided information both on short-term debt–equity and long-term debt–equity ratios, we introduce these variables separately instead of combining them to yield a composite debt–equity ratio. This allows us to test whether firms differentiate between financing instruments (banks versus stock market) to finance short-term, as compared to long-term needs.

Market capitalization ratio (MCR) equals the value of listed shares divided by GDP. The assumption behind this measure is that overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economywide basis.

Total value of shares traded ratio (STR) equals total value of shares traded on the stock market exchange divided by GDP. The variable measures the organized trading of firm equity as a share of national output and therefore should positively reflect liquidity on an economywide basis. The total value traded ratio complements the MCR: although a market may be large, there may be little trading.

Turnover ratio (TR) equals the value of total shares traded divided by value of shares listed. Although it is not a direct measure of theoretical definitions of liquidity, high turnover is often used as an indicator of low transaction costs. The TR compliments the MCR. A large but inactive market will have a large MCR but a small TR. Turnover also

t1.1 Table 1

t1.2 Summary statistics (1980–1997)

t1.3	Country name	Short-term debt/equity	Long-term debt/equity	Market cap/GDP	Shares traded/GDP	Turnover ratio	FDI (in million US$)	GDP (in million US$)	Growth rate (%)	INV	Liability/ GDP	Bank deposit/GDP
t1.4	Argentina	0.79	0.83	0.06	0.02	0.31	1816	160,111	1.99	18.79	0.15	0.20
t1.5	Brazil	0.49	0.52	0.14	0.08	0.52	3436	404,192	2.44	20.77	0.20	0.26
t1.6	Chile	0.92	0.81	0.49	0.05	0.08	1057	36,092	5.48	22.62	0.35	0.48
t1.7	Colombia	0.38	0.39	0.07	0.01	0.09	1135	50,463	3.68	19.65	0.27	0.16
t1.8	Egypt	0.91	0.88	0.07	0.01	0.09	773	37,682	4.33	22.55	0.80	0.57
t1.9	Greece	0.92	0.98	0.09	0.03	0.19	786	61,720	1.46	20.52	0.66	0.42
t1.10	India	0.29	0.38	0.14	0.05	0.49	539	259,554	5.52	23.10	0.42	0.33
t1.11	Indonesia	0.59	0.82	0.08	0.03	0.27	1497	123,756	6.91	29.43	0.30	0.33
t1.12	Korea, Rep.	0.52	0.41	0.25	0.28	1.00	2326	216,017	7.64	33.06	0.50	0.50
t1.13	Malaysia	0.49	0.53	1.22	0.56	0.32	2583	48,381	7.09	33.79	0.95	0.71
t1.14	Mexico	0.66	0.63	0.17	0.07	0.53	4134	243,171	2.31	22.28	0.24	0.19
t1.15	Nigeria	0.79	0.83	0.05	0.00	0.01	754	49,774	2.22	17.21	0.26	0.18
t1.16	Pakistan	0.83	0.72	0.10	0.04	0.24	264	41,301	5.71	18.93	0.40	0.34
t1.17	Peru	0.58	0.73	0.08	0.02	0.21	605	32,858	1.99	22.19	0.15	0.11
t1.18	Philippines	0.39	0.58	0.27	0.08	0.25	583	46,935	2.51	22.79	0.36	0.32
t1.19	Portugal	0.38	0.42	0.08	0.02	0.20	1950	58,372	2.60	27.82	0.73	0.80
t1.20	South Africa	0.71	0.83	1.38	0.10	0.07	207	98,591	1.74	20.74	0.45	0.58
t1.21	Thailand	0.39	0.48	0.29	0.20	0.59	1276	84,161	7.25	34.33	0.63	0.63
t1.22	Turkey	0.58	0.49	0.08	0.09	0.67	427	114,622	4.62	21.71	0.23	0.19
t1.23	Venezuela	0.81	0.73	0.09	0.02	0.16	767	64,250	1.46	19.30	0.42	0.22
t1.24	Zimbabwe	0.89	0.71	0.15	0.01	0.06	11	6154	3.94	20.46	0.39	0.22

compliments the total value traded ratio. While the total value traded ratio captures trading relative to the size of the economy, turnover measures trading relative to the size of the stock market. A small, liquid market will have a high TR but a small total value traded ratio.

Ratio of bank's liquid liabilities M3 to GDP is an indicator of the size of the banking sector in relation to the economy as a whole. Past studies have used this indicator to study the effect of the financial sector on the growth of the economy (see King & Levine, 1993; Levine & Renelt, 1992).

Ratio of banks' deposit of domestic assets to GDP. As in the case of the previous measure, this ratio is also an indicator of the size of the banking sector.

Other variables: To isolate the contribution of financial market development to the firms' choice of financial structure, we control for other variables that may affect the firm's financing choice. These measures are from the World Development Indicators (2000) data set and include:

- GDP
- FDI: FDI is used as a control variable because it is presumed that FDI is a determinant of economic growth.
- Investment (INV): This measure is defined as real investment divided by GDP.

4. Empirical model and regression results

4.1. Two empirical models

Consistent with the previous studies, this paper assumes that the debt–equity ratio of the firm, D^*, is a function of a vector, $\boldsymbol{X}$, of independent variables. These variables include the stock market and the banking indicators, among others. This may be formalized by the following equation.

$$\text{Model 1}: \quad D_{it}^{*} = \overrightarrow{\beta}, \overrightarrow{\boldsymbol{X}}_{it} + \delta_i + \gamma_t + \varepsilon_{it}$$

where subscript i and t represent the country and time, respectively, and δ, γ, and ε represent the country-specific effects, time-specific effects, and the stochastic term in the equation.[10] Given any level of equity initially, D^* rises if the firm issues additional debt and falls if the firm issues additional equity. We use this model to determine the role of the stock market and the banking sector on the financing choice of firms. A negative coefficient estimate for the stock market variable indicates that the firm leverage decreases with a marginal development in stock markets; that is, the firm substitutes equity for debt. On the other hand, a positive coefficient estimate implies complementarities between stock market development and debt. If the coefficient estimate is not significant, we can conclude that stock market development does not affect the financing choice of firms. Moreover, the issue of whether, in affecting debt and equity decisions,

[10] We conducted the Hausmann test. The test statistics were large enough to point to a random effects model.

the stock market and the banking sector, act as compliments or substitutes, can be addressed by considering the coefficient of the banking variables along with those of the stock market.

$$\text{Model 2}: \qquad D^*_{it} = \alpha D^*_{it-1} + \overrightarrow{\beta}\ \overrightarrow{X}_{it} + \delta_i + \gamma_t + \varepsilon_{it}$$

In this model, we have added a lagged dependent term to test whether firms try to maintain a specified debt–equity ratio as proposed by Rajan and Zingales (1998). If the coefficient value of the lagged dependent variable is below unity, we can conclude that the debt–equity ratio will be stable and convergent over time. This would then suggest that firm managers would tend *not* to alter the debt–equity ratio over time, consistent with Rajan and Zingales's work. However, if the coefficient is greater than unity, then the debt–equity ratio is not stable but divergent, implying that over time, firms will choose different debt–equity ratio depending on the stage of development of the economy and do not aim at maintaining a fixed debt–equity ratio over time. This result would in turn be inconsistent with the hypothesis advanced by Boyd and Smith (1998), with the implication that firms are more leveraged over time.[11]

4.2. Results

4.2.1. Correlation results

Table 2 presents the correlation matrix between leverage variables (debt/equity) and financial indicators. It is seen that the dominant correlation values between the stock market variables (equity) and leverage is negative and those between banking variables and leverage is positive. Moreover, the correlation between the stock market variables and banking sector variables is high and positive. Finally, FDI as proportion of GDP, and INV as a proportion of GDP are positively correlated with both the stock market variables and the banking variables: as discussed by Razin et al. (1998), both external debt and equity flows are more likely to take place in a more open economy than a closed one.

4.2.2. Panel regression results

These results are presented in Table 3. As mentioned earlier, in all cases, a Hausmann test rules out the possibility of fixed effects. Columns 1 and 2 present the results for variations in *short-term* debt–equity ratio as explained by stock market and banking variables; Columns 3 and 4 do the same for *long-term* debt–equity ratio. Furthermore, Columns 1 and 3 adopt a contemporaneous panel approach while Columns 2 and 4 adopt a dynamic panel approach, with lagged dependent variable included. Inclusion of FDI variable as a control is based on the hypothesis put forth by Razin et al. (1998) that more open economies are more likely to substitute equity for debt. Hence, we would expect a negative coefficient. The inclusion of the GDP variable is to control for the size of the economy.

The first observation that is readily made is that in all four columns, the banking and equity market variables have *opposite* effects on the financing choice of the firms: banking

[11] According to this view, firms choose between two different technologies: one which yields a return observable only to the lender (debt); the other which is observable to all (equity). This implies that over time, firms are less leveraged.

t2.1 Table 2
t2.2 Correlation coefficients

t2.3		Long-term debt/equity	Market cap/GDP	Shares traded/GDP	Turnover ratio	FDI	GDP	Growth	INV	Liability/GDP	Bank deposits/GDP
t2.4	Short-term debt/equity	.74	−.62	−.12	−.29	−.19	.31	.11	.59	.49	.53
t2.5	Long-term debt/equity	1	−.42	−.19	−.17	−.03	.49	.28	.72	.29	.71
t2.6	Market cap/GDP		1	.68	.04	.22	.04	.14	.32	.39	.50
t2.7	Shares traded/GDP			1	.44	.34	.17	.24	.48	.42	.39
t2.8	Turnover ratio				1	.28	.47	.27	.36	.02	.07
t2.9	FDI					1	.60	.12	.20	.03	.13
t2.10	GDP						1	.05	.11	−.18	−.05
t2.11	Growth							1	.41	.14	.15
t2.12	INV								1	.44	.50
t2.13	Liability/GDP									1	.83
t2.14	Bank deposit/GDP										1

variables are associated with a rise in the debt–equity ratio, while stock market variables are generally associated with a fall in that ratio. This result is contrary to the finding by Demirguc-Kunt and Maksimovic (1996), for reasons discussed earlier. The result suggests that firms substitute equity for debt associated with an increase in stock market activity (holding banking constant), and debt for equity in the presence of an increase in banking sector activity (holding stock market constant). Secondly, notice that while both coefficients of the banking sector activity are significant with similar t values, this is not true of the stock market, where only the MCR variable (Market Cap/GDP) is consistently

t3.1 Table 3
t3.2 Impact of stock market and banking variables on debt–equity ratio

t3.3	Dependent variables	Short-term debt/equity (static model)	Short-term debt/equity (dynamic model)	Long-term debt/equity (static model)	Long-term debt/equity (dynamic model)
t3.4	Constant	−3.14 (−3.89)*	−3.92 (−4.71)*	−4.22 (−3.98)*	−4.18 (−3.72)*
t3.5	Debt/equity ratio, $_{-1}$		0.04 (−0.63)		0.25 (−1.28)
t3.6	GDP	−0.01 (−1.12)	−0.02 (−0.69)	−0.22 (−1.28)	−0.23 (−0.93)
t3.7	Liability/GDP	0.93 (2.03)*	1.17 (2.01)*	0.34 (3.05)*	0.48 (2.32)*
t3.8	Bank deposit/GDP	0.18 (1.94)**	0.59 (2.04)*	0.29 (3.03)*	0.72 (2.79)*
t3.9	Market cap/GDP	−0.49 (−2.74)*	−0.66 (−2.01)*	−0.2 (−3.22)*	−0.18 (−2.39)*
t3.10	Shares traded/GDP	−0.58 (−0.69)	−0.34 (−0.04)	−1.34 (−1.68)	−0.99 (−1.02)
t3.11	Turnover ratio	−0.01 (−0.22)	−0.01 (−0.39)	−0.01 (−0.34)	−0.01 (−0.49)
t3.12	FDI	−0.55 (−2.20)*	−0.39 (−2.12)*	−0.29 (−1.04)	−0.19 (−0.18)
t3.13	INV	0.31 (−0.28)	0.11 (−1.46)	0.52 (1.98)*	0.28 (1.93)*
t3.14	Number of observations	359	359	359	359
t3.15	Adjusted R^2	.23	.21	.25	.22

t3.16 * t Statistics are significant at the 5% level.
t3.17 ** t Statistics are significant at the 10% level.

significant while the two other indicators are consistently insignificant. Because MCR captures the size of the stock market, one robust finding is that economies with larger stock markets have a smaller debt–equity ratios.

Some interesting insights may be gained by a comparison of the short-run versus long-run response of firms in their debt/equity. Consider the contemporaneous model presented in Columns 1 and 3. A comparison of the two columns suggests that a somewhat different behavior in the short run versus the long run: on the one hand, firms' response to both the banking and the stock market variables (measured by liability/GDP, bank deposit/GDP, and Market Cap/GDP) is more statistically significant in the long run than the short run; on the other hand, two of the coefficients (liability/GDP and Market Cap/GDP) actually have a *smaller* long-run size despite their higher significance, and one coefficient (bank deposit/GDP) rises in size *along* with significance in the long run.[12] We do not want to overstate the conclusions and implications of the results for the short run and long run because these differences could also imply the affect of the independent variables on the maturity structure of debt.

Continuing with the comparison of Columns 1 and 3, crucial differences also arise between the short-run versus the long-run role of FDI and INV. Specifically, an increase in FDI favors a choice towards equity and away from debt financing (lowering debt–equity ratio), but *only in the short run*. The scenario is *revered*, however, for the INV variable, with the effect being insignificant in the short run, and significant but *favoring debt* over equity (raising debt–equity ratio) in the long run.[13]

The results regarding the much smaller long-run effect of the Market Cap variable and the long-run insignificance of the FDI variable, are somewhat surprising in view of the optimism expressed in the literature (see the Introduction) on the role of equity markets in steering financing strategy away from debt and towards equity. One possible explanation may be that both FDI and stock markets in emerging economies entail a *speculative* element and have a shorter time horizon. If so, then equity financing would entail a potential long-run risk, arising from lower potential asset valuations. This would steer firms away from long-run equity financing.[14] By contrast, the INV variable represents long-run investments in physical capital. If such investments were to *drive* firms' financing choice, rather than be driven by it, then an increase in INV raises demand for sources of finance. With the perceived speculative nature of equity financing just discussed, firms would then turn to debt as their long-run instrument of choice associated with long-run capital investment demands; hence, the observed relation

[12] Later, our panel dynamic regressions will suggest that the coefficient of the debt–equity ratio is stable over time. This implies that despite the above findings, that is, the long-run dominance of the banking sector over the stock market, inducing debt financing over equity financing, debt–equity ratio nonetheless reaches stable value in the long run. The two findings are consistent if the debt–equity ratio rises in time but reaches an asymptotically stable level over the long run.

[13] Schmukler and Vesperoni (2000) who study firms' access to international capital markets (by focusing on international bond and equity markets) also find significant *differences* in the long-run versus short-run behavior of firms in adjusting their debt ratios.

[14] The speculative nature of FDI has been of special concern for many LDC governments due to the issue of capital flight. For instance, Chile required foreign investors to hold their investments for at least 1 year or they would be subject to a 35% tax (Glen & Pinto, 1994).

between higher INV and higher debt–equity ratio. It is also conceivable that real investment (INV) could be speculative in emerging economies. Alternatively, it is conceivable that FDI and INV could have a different impact on debt maturity structure in the short run and long run.

To examine the robustness of the results and their sensitivity to model selection and, specifically, to the inclusion of panel dynamic considerations, Columns 2 and 4 repeat the specifications of Columns 1 and 3 under *dynamic panel* estimation where we include the lagged dependent variable on the right-hand side. A comparison of the coefficients suggests precisely the same pattern as was found in comparing Columns 1 and 3. Thus, the results are consistent, pointing to their robustness with respect to these changes.

Finally, the coefficients of the lagged dependent variable in the panel dynamic results of Columns 2 and 4 are statistically insignificant and, in any case, less than unity. This implies that the debt–equity mix remains *stable* in the long run. Yet, we had found earlier that at least one of the banking variables (deposits/GDP) dominates the stock market variable in causing an increase in the long-term debt–equity ratio. The two findings are consistent if the debt–equity ratio rises in time but reaches an asymptotically stable level over the long run.

5. Summary and conclusion

This paper has empirically explored the effects of financial market development on the financing choice of firms. We have used aggregate firm-level data for a sample of 21 emerging markets from 1980 to 1997. The results show that stock market development as measured by market capitalization is significantly and negatively associated with the firms' debt levels relative to their equity position, while banking sector variables (especially bank deposits) are significantly and positively associated with debt–equity ratio. Although these results hold for both the short run and the long run, we find some differences in the short-run versus long-run effects of the banking and stock market variables. These differences between the short-run and the long-run nature of the stock market's role in the financing choice of firms, compared to the banking sector, echo an interesting parallel finding on the role of these same intermediaries in long-run economic growth, based on time series data of five developed countries (Arestis, Demetriades, & Luintel, 2001).

Similar short-run versus long-run differences seem to underlie the role of FDIs, which is positively associated with equity financing (over leverage) in the short run, but not the long run. Surprisingly, domestic investments show the opposite pattern: they are not important to equity financing in the short run but important in the long run. Finally, it is found that over the long run, the debt–equity ratio *converges* to a stable ratio, consistent with previous findings.

6. Uncited references

International Finance Corporation (IFC), 2000

International Monetary Fund (IMF), 2000

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Appendix A. Number of firms within the various emerging markets

Market	Average number of firms
Europe	
Greece	15
Portugal	20
Turkey	19
Latin America	
Argentina	23
Brazil	33
Chile	25
Columbia	21
Mexico	32
Peru	17
Venezuela	14
Asia	
Jordan	15
India	36
Indonesia	66
Korea	37
Malaysia	52
Pakistan	52
Philippines	22
Thailand	17
Africa	
South Africa	21
Nigeria	18
Zimbabwe	11

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