Private Investment and Cash Flow Relationship Revisited: Capital Market Imperfections and Financialization of Real Sectors in Emerging Markets

Firat Demir

University of Oklahoma

January 2007

Private Investment and Cash Flow Relationship Revisited: Capital Market Imperfections and Financialization of Real Sectors in Emerging Markets*

Fırat Demir

Department of Economics
University of Oklahoma
Hester Hall, 729 Elm Avenue
Norman, Oklahoma, USA 73019
Tel: (405) 325 5844
Fax: (405) 325 5842
E-mail: fdemir@ou.edu

Abstract

Based on the Euler equation approach, the paper analyzes the impacts of availability of internal funds on fixed investment spending in the presence of multiple investment options. It is argued that after financial liberalization real sector firms face a portfolio allocation problem between fixed and financial investments. Therefore, depending on the respective rates of returns the availability of internal funds may be a necessary but not sufficient condition for financing real investment projects. The empirical results using firm level data for Mexico and Turkey confirm this hypothesis and suggest that profits from fixed and financial assets have differential effects on fixed investment spending.

Keywords: Private Investment, Financing Constraints, Cash Flow, Portfolio Choice

JEL Classification Codes: C33, E22, E44, G11, O16

* I am thankful to Jaime Ros, Amitava K. Dutt, Kwan S. Kim, Kajal Mukhopadhyay, Jiandong Ju, Kevin Grier and session participants at the ASSA 2007 annual conference in Chicago and the Eastern Economic Association 2007 annual conference in NYC for helpful comments and suggestions. For financial support, I would like to thank the Helen Kellogg Institute for International Studies. All opinions and remaining errors are mine.

1. Introduction

The liberalization wave of the 1990s has reshaped the economic landscape of a majority of developing countries around the world. The most notable global change during this period has been the radical surge in the frequency and magnitude of financial transactions vis-à-vis goods markets as reflected in the skyrocketing daily foreign exchange (FX) trading that amounted to 1.9 trillion dollars in 2004 with an increasing gap between real and financial sector activities (BIS, 2004). Accordingly, annual FX trading to world trade ratio has significantly increased from 2/1 in 1973 up to 90/1 in 2004, while FX trading to World GDP ratio has reached 17/1 as of 2004 (BIS 2004; WDI).

In this respect, the impacts of financial liberalization and ensuing macro and microeconomic changes on the real sectors of the economy have been an attractive yet unresolved topic for the last two decades. In this debate, a consistently popular field of research has been the effects of financial liberalization on capital market imperfections and real sector investment performance. Accordingly, given the presence of capital market imperfections (that is exposed by the significance of the availability of internal funds in new investment decisions), financial liberalization was seen as a way of correcting such distortions and eliminating any hierarchy of finance.

In contrast, potential negative effects of financial liberalization have also been highlighted in the recent literature. In particular, the *financialization view* has questioned the allocative efficiency arguments of financial liberalization by pointing out the portfolio allocation problem faced by real sector firms between fixed and financial investments. According to this view, increasing volatility and uncertainty in macro and microeconomic environment, increasing real interest rates and lack of credit availability, and increasing product market competition when combined with the availability of higher rates of return in the financial markets may hinder real investments while favoring short-term financial investments (see. Crotty 2005; Dumenil and Levy 2005; Epstein and Jayadev 2005). In this respect, the so-called financialization of real sectors is seen as one of the reasons behind the

disappointingly low fixed capital formation rates in emerging markets during the 1990s (Unctad 2003).

The central motivation of this paper is to combine these two views of financial liberalization to answer the following question: given capital market imperfections, do internal funds, regardless of their origin, have a uniform effect on new fixed investment spending in the presence of investment opportunities in both real *and* financial sectors of the economy? In this respect, the article revisits the findings of previous research on the relationship between cash flow and private investment under credit constraints, at least in the case of developing countries after financial liberalization, by suggesting that availability of internal funds may be a necessary but not sufficient condition for financing real investment projects. Accordingly, profits from fixed and financial assets as well as their respective rates of returns may have different effects on new fixed investment decisions. The main contention here is that if the real sector firms face these two types of investments, then their portfolio allocation decisions will depend on both the cash flow and respective rates of returns.

On the other hand, even if the *financialization* view is correct, this may not necessarily reflect a negative development for real sector firms in the long run. Accordingly, given that rate of return on financial assets is an increasing function of risk, real sector firms may choose to exploit such investments to hedge against uncertainties regarding its operations and fixed investment projects as suggested by the standard portfolio theory of capital. As a result, financial investments may have a positive impact on the overall profitability of private firms and therefore on new fixed investment spending under credit constraints.

Given the lack of micro-level analysis of developing country experiences, the above hypothesis is tested using the evidence from two major emerging markets, namely Mexico, and Turkey. The dataset we employed is unique and can be expected to advance the existing debate by enabling in-depth testing of the hypothesis above. Briefly, we developed a highly detailed bi-annual

panel of all publicly traded industrial firms in Mexico and Turkey using firm level balance-sheet and income statement data for each country separately.

The empirical results based on Euler equation approach and the insights of a simplified portfolio choice model provide support to the main hypothesis while identifying certain differences between Mexico and Turkey. Briefly, in both cases we found that capital market imperfections continue to persist under financial liberalization. More importantly, the results challenged the findings of previous research on cash flow/private investment relationship. We discovered that financial and operational profits have quite different effects on private fixed investment spending. Financial profits also appeared to provide a hedging mechanism by providing cash flow in the subsequent periods. In both Mexico and Turkey, however, the positive effect seemed to be much weaker than the one from operational profits. The overall effect of cash flow from financial investments is actually negative in the case of Mexico and even though it is positive in Turkey, the economic effect of such profits is significantly smaller than those from operational activities. We also examined the effect of rates of returns from fixed and financial investments and have found similar results in both cases. Furthermore, comparing differential impacts of cash flow on small and large firms, we found that large firms faced an increasing credit squeeze during the 1990s. More interestingly, unlike large firms our findings indicate a positive effect of financial profits on fixed investment spending of small firms in both countries.

The paper is organized as follows: next two sections presents a brief review of the literature on the effects of financing constraints as well as of financial liberalization on investment and capital market imperfections. The fourth section introduces the theoretical model. The fifth section introduces the data, methodology and estimation methods. The sixth section presents the main results. The final section concludes the paper.

2. Capital Market Imperfections and Private Investment

Under the assumption of perfect capital markets, Modigliani and Miller (1958) suggested that financing decisions or capital structure of firms should not have any impact on private investment spending since firms are to have equal and unlimited access to investment finance at an exogenously determined cost. Instead, cost of capital given by the market should be the only determinant. In retrospect, the significance of this conclusion was that under these assumptions the importance of liquidity variables such as profits or cash flow disappeared unless they signaled future profitability. However, the empirical findings suggested otherwise by pointing out liquidity variables such as cash flow as significant determinants of fixed investment spending (e.g. Bond and Meghir 1994; Devereux and Schianterelli 1990; Fazzari, Hubbard, and Petersen 1988; Hayashi and Inoue 1991; Mairesse, Hall, and Mulkay 1999).

The apparent conflict between theory and empirical evidence led to the development of a new generation of research that offered a resolution to the above puzzle. Accordingly, under the presence of capital market imperfections private firm investments may be constrained by the availability of internal funds (for a review see Blundell, Bond, and Meghir 1996; Hubbard 1998). For example, in the case of hierarchy of finance approach firms are not indifferent between internal and external sources of funds since internally generated funds cost less than external ones to finance investment expenditures (Bond and Meghir 1994). Moreover, in the presence of asymmetric information between investors and firms or of agency costs, external finance may be more costly than internal sources (Jensen and Meckling 1976; Myers and Majluf 1984; Stiglitz and Weiss 1981).

Given the presence of capital market imperfections, therefore, financial liberalization was expected to generate capital market deepening, reduce agency costs and asymmetric information, eliminate rent-seeking caused by directed and subsidized credit programs, and increase efficiency while directing limited resources to more efficient investment projects at lower costs. Yet, on purely

theoretical grounds the effect of financial liberalization on total pool of loanable funds is ambiguous. Initially, its effect on increasing household savings was seen as one of the key components of the reform programs (McKinnon 1973; Shaw 1973). However, financial liberalization might indeed negatively affect savings, first by decreasing total amount of precautionary savings as a result of increased risk sharing across international capital markets (Devereux and Smith 1994). Secondly, when financial liberalization includes capital account liberalization there is no guarantee that capital inflows will outweigh outflows by residents. Thirdly, the degree of ex-post credit availability is partly constrained by the after-liberalization interest rate, which depends on its previous level under autarky (Henry 2000, p.304).

Regarding the net effect of financial liberalization on efficient allocation of loanable funds, there is also some ambiguity. Given that financial liberalization is expected to increase total funds available for more risky investment projects, it may negatively affect the banking sector portfolios by encouraging credits to more risky borrowers. According to IMF (1995) this was exactly the reason behind the increase in non-performing loans in the banking sector in Mexico during the course of 1990s.

On the empirical side of the picture, despite the findings of Mairesse, Hall, and Mulkay (1999), which argued that the impact of profits on investment decreased in the US and France as a result of deregulation of financial markets during the 80s, there are serious doubts on the success liberalization programs in the case of developing countries. For instance, Laeven (2003) for 13 developing countries and Gelos and Werner (2002) for Mexico found that financial liberalization affected small and large firms differently by releasing financial constraints for the former and increasing for the latter. Likewise, the existing empirical research failed to uncover any robust evidence of efficiency gains in the financial sectors. In this respect, there are also some questions over the contribution of foreign banks to the capital accumulation and financial stability. Peek and Rosengren, (2000), for example, showed that the increased share of total claims attributable to

foreign banks in Latin America came at the expense of domestically owned private banks. Similarly, Goldberg, Dages, and Kinney (2000) found little difference between domestic and foreign owned banks' loan behavior and the composition of loan portfolios in Argentina.[1]

In the case of both Mexico and Turkey, private firms still continue to face strict credit rationing and are forced to finance fixed investment projects mostly from internal sources and short-term borrowing (EIU 2003a, p. 8, 13; 2003b, p. 37). For example, as of 2005 the share of short-term debt in total debt of top 500 manufacturing firms in Turkey was around 70% (ISO). Furthermore, total bank credit to the private sector as a share of GDP in both Mexico and Turkey has been depressingly low: the ratio was 15% and 18% in 1980-89, 25% and 20% in 1990-99, and 16% and 20% in 2000-2005 respectively, which are well below the high income OECD average of over 160%. Regarding capital market deepening, the scoreboard of last two decades is also disappointing. During this period several Latin American countries (especially Mexico) have developed money markets mostly in short-term government papers, while capital markets in private securities remained underdeveloped (Rojas-Suarez and Weisbrod 1996). Similarly, as of 2004 around 98% of secondary market transactions were of government securities in Turkey with an average of 88% during the course of 1990s (SPK 2004). The existing evidence also suggests an increase in the volatility of stock markets, which were expected to be more stable and become a reliable source of financing after financial liberalization (Grabel 1995; Wei and Zhang 2006).

3. Increasing Risk, Volatility and Fixed Investment Performance

Following financial liberalization, there have also been substantial changes in the financial sector behaviour and key macro prices. The growth volatility, for example, has declined across developed countries (McConnell and Perez-Quiros 2000). The results, however, are not uniform in developing countries. Montiel and Serven (2004) reported a decline in the per capita GDP growth

[1] For a discussion see Moreno and Villar (2005).

volatility in developing countries from 4% in the 1970s and 1980s to about 3% in the 1990s, which even then remained well above the 1.5% average of developed countries. They also reported that the reduction in volatility was not uniform and one third of 77 countries analyzed did actually see an increase in growth volatility during the 1990s. Similarly, Kose, Prasad, and Terrones (2003) found an increase in consumption volatility in emerging markets during the 1990s. Furthermore, Gabriele, Boratav, and Parikh (2000, p.1051) pointed out the 'high, rising and unpredictable" volatility of capital flows to developing countries during the 1990s compared to late 70s and 80s. Regarding microeconomic uncertainty and volatility, we see similar changes in both developed and developing economies. Comin and Mulani (2006) and Wei and Zhang (2006) for the US, and Thesmar and Thoenig (2004) for France discovered an increase in sales and earnings volatility of publicly listed firms for the last three decades.

When looking at the impacts of uncertainty and instability in macroeconomic environment, Aizenman and Marion (1999), Hausmann and Gavin (1995) and Serven (1998) found a negative relationship between private investment and several economic instability measures in developing countries. In addition, real exchange rate instability is found to have a both economically and statistically significant negative effect on investment and growth in both developed and developing countries (Driver and Moreton 1991; Edwards 1989; Federer 1993; Pindyck and Solimano 1993).

In this picture, we argue that increasing uncertainty and volatility when combined with persistent capital market imperfections and booming financial markets with large spreads between rates of return on financial and real sector activities leads to the financialization syndrome among real sector firms as the investors shorten their time horizons either to benefit from speculative gains *or* to avoid excess risk. As a result, increasing macro volatility and rising rates of returns in the financial markets may lead to a slow down of investment in the real sectors while favoring those in the financial sectors. In order to compare the profitability of financial investments, we looked at the average rate of return in the financial markets using the net arbitrage gain as a proxy (calculated

using the uncovered interest parity condition as the difference between domestic monthly T-bill rates deflated by the next period average depreciation of domestic currency, and the US T-bill rate)[2]. Accordingly, the financial return arbitrage has increased from negative numbers during pre-liberalization era to as high as 42% and 82% on average in Mexico in 1995 and in Turkey in 2003 respectively with a maximum of 259% in March 1995 in Mexico and 466% in May 1994 in Turkey. The annual average between 1990 and 2005 has been 11.5% and 22% respectively. The real interest rates also remained very high in international standards at 4.5% and 10.5% on average between 1990-2005 with a peak at 9.5% in 1999 and 25% in 2002 in Mexico and Turkey respectively.

The existing empirical evidence also suggests the presence of such a structural change in real sectors. In the case of the US, for example, the ratio of profits of financial corporations to those of non-financial corporations (NFC) rose from around 15% in the early 50s and 60s to around 50% in 2001 (Crotty 2005, p.85). During this period, the ratio of NFC portfolio income to cash flow also rose from around 14% in 1960s to around 37% towards the end of 90s in the US (Crotty 2005, p.107). In the case of increasing cost of external financing, Dumenil and Levy (2005) estimated that in France about 2.4% points of profits were lost due to interest payments from the mid 1980s and 1.7% in the US. Likewise, Epstein and Jayadev (2005) estimated that the income share of firms engaged primarily in financial activities has risen over and above that of non-financial sector averages in all OECD countries between 1960s and 1970s, and 1990s. In the case of Turkey, the share of financial revenues in overall profits of top 500 manufacturing firms jumped up to 547% in 2001 from around 15% in 1982 (ISO). During this period the average ratio increased from around 23% between 1982 and 1989 (pre-liberalization period) to around 112% between 1990-2002 (post-liberalization period). We also see a sharp decline in the median profit margins (defined by operating

[2] That is $[(1+R)/(1+\hat{E})]-(1+R^*)$ where R is 3-month domestic T-bill rate, $\hat{E}$ is average depreciation of domestic currency against U.S. dollar, R* is 3-month US T-bill rate.

profit to net sales ratio) of Mexican and Turkish firms in our dataset from 13 and 20 percent during early and mid 1990s to around 8% and 4% in 2003 respectively (Figure 1).

<Insert Figure 1 here>

Using our dataset, we also examined the changes in the volatility of operational profits in Mexico and Turkey and compared them with the changes in the share of financial investments in the asset structure of firms. We found some evidence of hedging motive behind firms' portfolio diversification decisions between fixed and financial assets. The simple correlation and covariance of volatility of operating profits and the share of financial assets in total assets is found to be positive. Furthermore, Figure 1 below also supports the view that increasing uncertainty regarding cash flow from real sector activities may encourage more financial investments.

<Insert Figure 2 here>

Thus, we argue that in order to diminish the debt burden and declining rates of return vis-à-vis financial sectors real sector firms have invested in financial assets. The positive relationship between operating profits volatility and financial investments also suggest the presence of hedging motivations in investment decisions. The covariance between rates of returns on fixed and financial assets also lends some support to this view. Accordingly, we found a very low yet positive covariance between these two rates of returns in Mexico (0.03). It is however, negative in the case of Turkey (-0.26) as would be expected under the portfolio theory of capital.

The overall picture of Mexican and Turkish economies during the 1990s is also consistent with the insights of financialization view. During this period, despite booming financial markets both countries experienced comparatively low growth rates and steadily declining fixed capital formation in the economy that led Unctad (2003) to include them in the group of deindustrilizers among other emerging markets. While the gross fixed capital formation as a percentage of GDP fell from an average of 21% to 19% between 1980-89 and 2000-05 in Mexico, it stayed at the same level of 22%

in Turkey. These rates are well below the 25% minimum that Unctad (2003, p.61) identified as the required threshold to generate high and sustained growth in middle-income developing countries.

4. Theoretical Framework: The Euler equation and portfolio choice model

In order to test the capital market imperfections and financialization hypothesis (more on this later) we adopt the Euler model of investment, which allows for financial frictions and is closely based on Bond and Meghir (1994) and Laeven (2003).[3] As discussed by Blundell, Bond, and Meghir (1992), Bond and Van Reenen (1999) and Laeven (2003) Euler equation approach has a number advantages over other methods such as the q-model of investment or the Abel and Blanchard (1986) model. Accordingly, the Euler model (as developed by Abel 1980) avoids the use of share price data and "the economic structure characterizing the investment decision may be investigated without imposing the auxiliary assumptions that have been used to measure the shadow value of capital" as is the case in the q-model or Abel and Blanchard (1986) (Blundell, Bond, and Meghir 1992, p. 399). For simplicity, any bankruptcy costs and taxes, which were initially included in Bond and Meghir (1994) are excluded.

We assume that firm's main target is to maximize its present value (V_t) (which is equal to expected value of future dividends) subject to capital accumulation and external borrowing constraints. We incorporate financial frictions by assuming that debt is the marginal source of external finance and risk-neutral debt holders demand an external finance premium, $\eta_t = \eta(B_t)$ where $\partial\eta/\partial B > 0$ due to agency costs and asymmetric information, which forces heavily indebted firms to pay an increasing premium on their borrowing. The gross required rate of return on debt is assumed to be equal $(1+r_t)(1+\eta(B_t))$, where r_t is the riskless rate of return and given our assumption of risk neutral share holders, it is equal to the interest rate on default-free bonds and is given *exogenously* to

[3] For a review of econometric modeling of company investment see Blundell, Bond, and Meghir (1992).

the firm.[4] Also a nonnegativeity constraint is enforced on dividends in order to have debt rather than equity to be the firm's marginal source of finance (i.e. $D_t \geq 0$) . The advantage of this modification is that the optimal path for investment remains unaffected by the introduction of debt finance into the model and makes it unnecessary to make any assumptions about the firm's optimal borrowing policy.

The profit function is then given by $\Pi_t = \Pi(K_t, L_t, I_t)$, where L_t is a vector of variable inputs and I_t is the gross investment at time t. The owner of the firm then tries to maximize (E is the expectations operator):

$$V_t = E_t[\sum_{J=0}^{\infty} \beta_{t+J}^t D_{t+J}] \tag{1}$$

where $\beta_{t+J}^t = \prod_{i=1}^{J} 1/(1+r_{t+i-1})$ for $j \geq 1,$ and $\beta_1^1 = 1$

subject to:

$$D_t = \Pi_t + B_t - (1+r_{t-1})(1+\eta(B_{t-1}))B_{t-1} \tag{2}$$

$$K_t = (1-\delta)K_{t-1} + I_t \tag{3}$$

$$D_t \geq 0 \tag{4}$$

Substituting (2) into (1) for D_t and eliminating I_t from $\Pi_t(\ )$ by using (3), we get the following maximization problem for capital K_t :

$$\underset{\{K_{t+j}, L_{t+j}, I_{t+j}, B_{t+j}\}}{Max} E_t[\sum_{j=0}^{\infty} \beta_{t+j}^t \{(1+\lambda_{t+j})(\Pi_{t+j}(K_{t+j}, L_{t+j}, K_{t+j} - (1-\delta)K_{t+j-1}) + B_{t+j} - (1+r_{t+j-1})(1+\eta(B_{t+j-1}))B_{t+j-1}\}] \tag{5}$$

where λ_{t+j} is the shadow cost of internal funds (i.e. non-negativity constraint on dividends). The first order condition (foc) for K_t then gives:

[4] We simplify the model by assuming that the discount factor, r_t is constant over time and across firms as in Bond and Meghir (1994), Gilchrist and Himmelberg (1995), and Leaven (2003).

$$-(1-\delta)\beta_{t+1}^{t}E_t[(1+\lambda_{t+1})\left(\frac{\partial \prod}{\partial I}\right)_{t+1}] = -(1+\lambda_t)\left(\frac{\partial \prod}{\partial K}\right)_t - (1+\lambda_t)\left(\frac{\partial \prod}{\partial I}\right)_t \quad (5a)$$

Similarly, the foc for debt (B_t) gives:

$$(1+\lambda_t) = E_t\left[(1+\lambda_{t+1})\left(1+\eta_t + \frac{\partial \eta_t}{\partial B_t}B_t\right)_t\right] \quad (6)$$

which shows that marginal cost of external borrowing determines the relationship between the shadow value of internal finance at time *t* and *t+1*.

As long as $D_t > 0$, the firm's net revenues are large enough to finance its investment from its retained earnings and pay positive dividends at the same time. Under this assumption, the shadow value of internal finance, λ_t, is zero and (5a) becomes:

$$-(1-\delta)\beta_{t+1}^{t}E_t[\left(\frac{\partial \prod}{\partial I}\right)_{t+1}] = -\left(\frac{\partial \prod}{\partial K}\right)_t - \left(\frac{\partial \prod}{\partial I}\right)_t \quad (7)$$

In order to obtain an empirical model of investment, the net revenue function is specified as:

$$\prod_t = p_t F(K_t, L_t) - p_t G(I_t, K_t) - w_t L_t - p_t^I I_t \quad (8)$$

where $G(I_t, K_t) = \frac{1}{2}bK_t[(I/K)_t - c]^2$ is a symmetric adjustment-cost function, which is linearly homogenous in investment and capital and is strictly convex in investment. *F(K, L)* is a constant returns to scale production function, p_t is the price of firm's output, w_t is the vector prices of the variable inputs L_t, and p_t^I is the price of investment goods. To allow for imperfect competition p_t is assumed to depend on net output, Y_t, with the price elasticity of demand, ε, assumed constant and $\varepsilon > 1$.

Given that p_t depends on output $Y(K_t, L_t, I_t) = F(K_t, L_t) - G(I_t, K_t)$, we differentiate (8) with respect to I_t and K_t and get the following relationships:

$$\left(\frac{\partial \prod}{\partial I}\right)_t = -\left[1-\left(\frac{1}{\varepsilon}\right)_t\right]p_t\left(\frac{\partial G}{\partial I}\right)_t - p_t^I = -\alpha p_t\left(\frac{\partial G}{\partial I}\right)_t - p_t^I \quad (9)$$

where $\alpha = 1 - (1/\varepsilon) > 1$

Similarly,

$$\left(\frac{\partial \prod}{\partial K}\right)_t = \left[1 - \frac{1}{\varepsilon}\right] p_t \left[\left(\frac{\partial F}{\partial K}\right)_t - \left(\frac{\partial G}{\partial K}\right)_t\right] = \alpha p_t \left[\left(\frac{\partial F}{\partial K}\right)_t - \left(\frac{\partial G}{\partial K}\right)_t\right] \tag{10}$$

Given $G(I_t, K_t) = \frac{1}{2} b K_t [(I/K)_t - c]^2$

$$\left(\frac{\partial G}{\partial I}\right)_t = b\left(\frac{I}{K}\right)_t - bc \tag{11}$$

Inserting (11) into (9) we get:

$$\left(\frac{\partial \prod}{\partial I}\right)_t = -b\alpha p_t \left(\frac{I}{K}\right)_t + b\alpha p_t - p_t^I \tag{9a}$$

Under the assumption that Y_t is homogenous of degree one in both K_t and L_t, we have:

$$F(K_t, L_t) = \left(\frac{\partial F}{\partial K}\right)_t K_t + \left(\frac{\partial F}{\partial L}\right)_t L_t \tag{12}$$

and from $G(I_t, K_t) = \frac{1}{2} b K_t [(I/K)_t - c]^2$ we have:

$$\left(\frac{\partial G}{\partial K}\right)_t = \frac{G(I_t, K_t)}{K_t} - b\left(\frac{I}{K}\right)_t^2 + bc\left(\frac{I}{K}\right)_t \tag{11a}$$

Substituting (11a) and (12) into (10) we get:

$$\left(\frac{\partial \prod}{\partial K}\right)_t = \alpha p_t \left(\frac{Y}{K}\right)_t - \alpha p_t \left(\frac{\partial F}{\partial L}\frac{L}{K}\right)_t + b_t \alpha p_t \left(\frac{I}{K}\right)_t^2 - bc\alpha p_t \left(\frac{I}{K}\right)_t \tag{13}$$

Assuming that the marginal products of variable factors ($\partial F/\partial L$) can be replaced from the first order conditions by ($w/\alpha p$), we do not need to have a parametric form for the production function.

Substituting (9a) and (13) back into (5a) and setting λ_t and λ_{t+1} equal to zero gives the following empirical Euler equation under the null hypothesis of no financial frictions:

$$\left(\frac{I}{K}\right)_{t+1} = c(1-\phi_{t+1}) + (1+c)\phi_{t+1}\left(\frac{I}{K}\right)_t - \phi_{t+1}\left(\frac{I}{K}\right)_t^2 + \frac{\phi_{t+1}}{b(\varepsilon-1)}\left(\frac{Y}{K}\right)_t - \frac{\phi_{t+1}}{b\alpha}\left(\frac{CF}{K}\right)_t + \frac{\phi_{t+1}}{b\alpha}J_t + V_{t+1} \quad (14)$$

where $\phi_{t+1} = (1+\rho_{t+1})/(1-\delta)$ with $\rho_{t+1} = (1+r_{t+1})(p_t / p_{t+1}) - 1$ being the real discount rate, $(CF/K)_t=(p_tY_t - w_tL_t)/(p_tK_t)$ is the ratio of real cash flow to the capital stock. $J_t = (p_t^I / p_t)\{1 - p_{t+1}^I(1-\delta)/[(1+r_t)p_t^I]\}$ is the user cost of capital, $Y_t = F_t - G_t$ is net output and V_{t+1} is an error term.

Equation (14) is the standard Euler equation that is used in the literature for testing financing constraints in the presence of only one type of investment asset in the portfolio of the firm. However, if the financialization hypothesis is correct, then the availability of alternative forms of investments and their rates of returns will need to be included in the investment function of the firm. In theory, if we assume that the r_t is equal to the rate of return on financial investments, equation (14) implicitly includes the impact of the profitability of financial investments through the discount rate that the firm uses in discounting its future dividends. Thus the higher the rate of return on alternative (i.e. financial) investments, the higher the opportunity cost and therefore the discount rate of fixed investment projects. This will eventually lead to lower net present value of fixed investment projects, and thus to lower investment spending.

We can further highlight the differences in firms' portfolio allocation decisions and their reactions to ensuing profits from different investments using a modified version of the model by Le and Zak (2006). Our simplified portfolio model includes a large number of identical agents living in a developing country where they consume their returns from wealth invested in one-period investment projects in fixed (i.e. factories) or financial assets (i.e. T-bills). For simplicity there is only one type of investment in each type of assets that can be considered as a portfolio of multiple

investment assets (i.e. machinery, building etc for fixed assets; and T-bills, stocks, bonds and foreign exchange assets for the financial assets). We also assume a single homogenous good produced, and the immobile population is normalized to one with a zero growth rate.

Let I_t^k be fixed investment assets at time t with a rate of return r_t^k. Investment in fixed assets is risky, $r^k \sim N(\mu, \sigma^2)$. Agents can also invest I_t^f in financial assets with a risk-free time-invariant rate of return r^f (that is equal to riskless rate of return on financial assets such as 3-month U.S. T-bills and is equivalent to r_t in equation (14)). This can also be interpreted as riskless financial asset return *plus* exchange rate risk and country risk. Both types of investments are undertaken at the beginning of time t using the initial wealth of W_0. The standard maximization by a representative firm of the expected utility from such investments gives us:

$$\underset{W_t}{Max} E\sum_{t=0}^{\infty} \beta^t U(W_t) \tag{15}$$

subject to:

$$W_t = (1 + r_t^k) I_t^k + (1 + r^f) I_t^f \tag{16}$$

where $U(W)$ is strictly increasing, continuous and concave.

To save space, we refer to Huang and Litzenberger (1988) and Le and Zak (2006) for a derivation of this standard portfolio choice model. Using (15) and (16) and applying the Stein's Lemma[5] the optimum allocation equation becomes:

$$I_t^{k*} = \frac{E(r_t^k - r^f)}{\gamma Var(r_t^k)} \tag{17}$$

taking natural logs yields:

$$\ln(I_t^{k*}) = \ln(E(r_t^k - r^f)) - \ln\gamma - \ln(Var(r_t^k)) \tag{18}$$

[5] That is $Cov(g(x), y) = E(g'(x))Cov(x, y)$.

where $Var(r_t^k)$ is the variance of the rate of return on fixed investments that is interpreted as economic uncertainty, and $\gamma \equiv -(E[U''(W_t)]/E[U'(W_t)])$ is the risk aversion that is assumed to be constant. (18) suggests that fixed investments increases as a) rate of return on fixed assets (that is operating profitability) increase, and/or rate of return on financial assets (i.e. financial asset profitability) decrease, and b) economic uncertainty decreases.

We can incorporate (17) into the complete version of firm's optimal investment path given by (14) via separating operating profits from financial profits. This would also enable us to compare our results with the previous work that used the Euler equation approach without separating the source of profits and their respective rates of returns, which we discuss in the next section.

4.1 Empirical Testing

Following equation (14) the presence of financing constraints is then tested by the following reduced form specification for each country separately:

$$\left(\frac{I}{K}\right)_{it} = \beta_1\left(\frac{I}{K}\right)_{i,t-1} + \beta_2\left(\frac{I}{K}\right)^2_{i,t-1} + \beta_3\left(\frac{Y}{K}\right)_{i,t-1} + \beta_4\left(\frac{CF}{K}\right)_{i,t-1} + d_t + f_i + v_{it} \qquad (19)$$

where d_t and f_i are time and firm specific effects correspondingly with subscripts i and t referring to the firm and time period. Under the null hypothesis of no financial frictions, $\beta_1 > 1$, $\beta_2 < -1$, $\beta_3 \geq 0$ (given that Y/K controls for imperfect competition given $1 < \varepsilon < \infty$ and would be eliminated from the above equation under perfect competition), and $\beta_4 < 0$. In this specification, if we find $\beta_4 > 0$ that is increasing cash flow has a positive effect on investment, the firm is assumed to be financially constrained. Similar to Bond and Meghir (1994) and Leaven (2003) we drop the user cost of capital from the empirical specification given complications in its measurement.

Besides testing for financial frictions, we also test whether cash flow from different types of assets (and their rates of returns) have different effects on fixed investment decisions. Accordingly, based on the portfolio choice model we contend that in the presence of multiple investment options,

the sign on β_4 might be indeterminate. In particular, as argued by Tornell (1990) given the uncertain environment in developing countries, real sector firms may prefer to invest in more liquid reversible assets (I^f) in the financial sectors that also offer comparable or higher rates of return on their investments rather than on irreversible fixed assets (I^k_t) (as suggested by (18)). If this is the case real sector firms may have financial investments (I^f_t) that is positively related to the risk-free interest rate, which is positively related to the external borrowing cost.

Therefore, the measurement of cash flow can make a significant difference especially given the lack of any consensus regarding its calculation in the empirical literature. In fact, the construction of cash flow variable in investment equations varies without any consistent approach to what constitutes available internal funds for fixed investment. The data availability rather than theory seems to be the dictating rule. While in some cases net profits are used as cash flow, in others operating profit or operating profit plus depreciation, or some other measure is used. Eisner (1978), for example, adopted net profits after depreciation as cash flow measure while Bond and Meghir (1994) defined cash flow as operating profits before tax, plus depreciation provision, plus interest and preference dividends. Likewise, Leaven (2003) used operating income plus depreciation while Mairesse, Hall, and Mulkay (1999) experimented with both cash flow and operating profit where cash flow is defined as operating income plus net financial profits, plus net extraordinary items, minus taxes.[6]

Given the endogenous nature of portfolio allocation decision, what the previous research omitted in the measurement of cash flow is the interdependent relationship between fixed and financial capital. As a result, when measured by financial rather than operating profits the coefficient β_4 may have a positive or negative sign (or the same sign but different magnitudes) depending on the

[6] Bond and Devereux (1990), and Edwards, Kay, and Mayer (1987) discuss in detail several points researchers need to be aware of when using firm balance sheet data for economic analysis.

impact of profits from financial investments on fixed investments especially if there are any frictions within the firm between different departments in charge of investment planning. Thus, we may get a negative sign not because of a lack of financial frictions but because of a possible negative relationship between financial profits and fixed investment decisions to the extent that increasing financial profits signal increasing rates of return on financial assets while raising the discount rate in equation (14). Or in the opposite case (i.e financial profits having a positive effect), we may conclude that financial investments are used as a hedging mechanism and as such have a welfare enhancing effect in developing countries. Yet, even then we may have differential economic impacts depending on the source of profits and departments in charge of decision making within the firm. In both cases, however, if there are no internal frictions within the firm we expect to find a positive relationship between cash flow variables and fixed investment once controlled for their respective rates of returns.

In addition to testing for financial frictions and differential impacts of cash flow from different sources, we also separated expected profitability rates from cash flow by looking at the effects of the profitability of different types of investments. If both financial and operational profitability variables (measured by respective rates of return) have a positive impact on new fixed investment decisions, this may suggest that real sector firms use financial investments as a hedging mechanism against uncertainties in the market and use expected profits from such activities the same as from operational activities despite a higher discount rate in equation (14). However, if we fail to find a positive relationship between rates of return on financial investments and fixed investment spending, this will imply that high return alternative investments in non-operational activities may result in a low-level equilibrium with lower fixed investment rates.

4.2. Estimation

In the estimation, the financial profits variable is measured as the realized financial income net of financial expenses except interest cost. Namely, it includes dividend income from subsidiaries

and affiliates plus interest income and other dividends, plus net gain from foreign exchange transactions, plus other income from other operations (such as from financial derivatives) net of losses and expenses from such operations. The operational profits are defined as net-operating revenues minus cost of goods sold, minus operating expenses. The financial assets include current assets (cash, bank deposits, etc.) and short-term investments (stocks, treasury bills, bonds, repo, etc.), while net fixed assets include all existing fixed capital stock net of land and depreciation. A detailed discussion of the variables is presented in the appendix. For simplification we have re-written equation (19) as follows:

$$I_{i,t} = \beta_1 I_{i,t-1} + \beta_2 I_{i,t-1}^2 + \beta_3 KO_{i,t-1} + \beta_4 CF_{i,t-1} + d_t + f_i + v_{it} \tag{20}$$

where I_{it} is measured as the real net fixed investment of firm *i* in year *t* and is measured by the logarithmic difference of net fixed capital stock at constant prices (Δk_{it}).[7]

$(Y/K)_{it}$ is measured with the capital-output ratio *(i.e. KO* that is the inverse of *Y/K*) and measures the presence of imperfect competition as well as the assumption that output and capital are proportional. Hence, a decreasing *KO* ratio is expected to increase new investment. Also, the lag in the response of investment spending to capital/output ratio result from the role of expectations given that new investment depends on expected future sales which themselves rely on current and past sales, and adjustments costs and delivery lags (Abel and Blanchard, 1986).

CF_{it} is a set of cash flow and profitability variables reflecting the effects of the availability of internal funds as well as expectations about future profitability and opportunity cost of fixed investment and includes: a) current and lagged ratios of financial and operational profits to beginning capital stock (*FK* and *OK* respectively), which capture the effects of financial and liquidity

[7] $\Delta k_{it} = \log[K_{it} / K_{i,t-1}] = \log[1 + \Delta K_{it} / K_{i,t-1}] \cong \Delta K_{it} / K_{i,t-1} \cong I_{it} / K_{i,t-1} - \delta$

where δ is the depreciation rate, and log is the natural log.

constraints as well as of the cash flow from financial investments and, b) rates of return on fixed (r^k) and financial (r^f) assets where the latter captures not only the market signals regarding future profitability in non-real sector activities but also the effects of opportunity costs.

The novelty introduced here is to look at different components of profits when analysing their effects on I_{it}. If Modigliani and Miller (1958) is correct, cash flow should not have any effect on fixed investment decisions. On the other hand, in the presence of capital market imperfections all previous research assumed that overall profitability has a uniform effect on investment decisions independent of its subcomponents since the primary source of profits is presumed to be operational activities. In other words, for a real sector firm operational profits and r^k is assumed to have the same positive effect on fixed investment as financial profits and r^f. However, the sign on financial profitability measure is in fact indeterminate: a positive operational profits (including r^k) and financial profits (including r^f) coefficient would suggest that financial constraints are important and both profit variables have the same positive effect on investment decisions. If this is the case, then financial investments by real sectors firms will indeed have a positive impact on capital accumulation by providing fresh funds even during times of high volatility or uncertainty. If, however, we found a positive operational profits (OK) and r^k, and a negative financial profits variable (FK) and r^f, this would suggest that a short-term distortion might have long-term consequences by inducing deindustrialisation in developing countries. In other words, if increasing profits from financial investments are not used for financing real investments, then we may have a low-level equilibrium where firms engage in more and more non-real sector activities without contributing to fixed capital formation. To the extent that the rate of return on financial assets reflects the opportunity cost of fixed investment as well as future profitability of such assets, it is expected to have a negative coefficient.

5. Data and Methodology

5.1. Data

The datasets are from the audited financial accounts of publicly traded industrial firms and are unbalanced. The period analysed is biannual and cover 1990:2-2003:2 for Mexico and 1993:1-2003:2 for Turkey. The primary reason for using biannual data is to capture the effects of sudden changes in profitability and risk conditions in the market on the investment positions of the firms (especially regarding financial investments and profits). Given the highly liquid nature of short-term financial investments, annual end-of-year values would be highly biased in presenting the changes in both stock and flow values of financial assets and profits during the year.

The firm level data for Mexico mostly came from Economatica, a commercial database providing financial statement data for publicly traded Latin American companies.[8] For Turkey the data were obtained from the Istanbul Stock Exchange Market online database. In some cases Worldscope International, Datastream, and original firm financial statements are also used for robustness and completeness. We have eliminated those firms with less than 8 consecutive periods from the dataset as well some extreme outliers. In the case of Mexico, there are 79 firms in the final dataset with 63 in manufacturing (ISIC 15-37), 4 in mining (ISIC 10,12,13,14) and 12 in construction (ISIC 45). For Turkey, there are 172 firms all in manufacturing (ISIC 15-37). A description of the data and measurement issues are provided in the appendix with summary statistics (Table 4).

5.2. Methodology

The datasets consist of non-random stock market quoted firms, which may receive market listing only if they satisfy certain conditions. Therefore, in order to correct for parameter endogeneity resulting from the presence of unobserved firm-fixed effects as well as to correct for the correlation

[8] There are certain problems with the Economatica database that researchers need to be aware of. An appendix including a detailed list of problems is available from the author upon request.

between the lagged I_{it} and firm specific effects and the error term, we used a Generalized Method of Moments (GMM) estimator by Arellano and Bond (1991)'s first differencing transformation that is widely applied to have a consistent estimate for dynamic panel equations. Accordingly, we apply the following first-difference transformation using Arelano and Bond (1991) GMM estimation. The first differencing is assumed to remove the individual firm-specific effects while the GMM estimation corrects for any remaining endogeneity as well as the correlation between Δv_{it} and Δy_{it}:

$$\Delta y_{it} = \alpha \Delta y_{it-1} + \beta' \Delta x_{it} + \Delta v_{it} \qquad (21)$$

In this transformation, if x_{it} is serially uncorrelated then $x_{i,t-s}$ will be uncorrelated with x_{it}^{*} for $s \geq 2$. This means that if the error term in the investment equation is serially uncorrelated, lagged values of the transformed (or untransformed) dependent variable[9] and other right-hand side variables dating *t-s* will be uncorrelated with the transformed error term as long as $s \geq 2$. As discussed by Bond and Meghir (1994, p.210), remote lags are not likely to provide much additional information and therefore we did not include all moment restrictions in our calculations (we used $2 \leq t \leq 3$ lagged values of right hand side variables and time dummies at levels as instruments[10]). The validity of the instruments and the estimation are tested by two specification-tests as suggested by Arellano and Bond (1991). The first one is the Sargan-test of over-identifying restrictions for testing the validity of instruments used. The second one is the usual m_2 test that is a second-order serial-correlation test of the residuals from the first-difference equation. The reason for this is that the use of endogenous *t-2* dated variables is valid only if there is no serial correlation in the error term of order 2.

[9] On this issue, see e.g. Greene (1997, p.641).

[10] In the GMM estimation, the White period based on Arellano and Bond (1991) 2-step method is used for GMM weighting matrices. The reported coefficient covariances are robust and corrected using White (1980) period weights from final iteration.

6. Results

The results from Table 1 shows that investment is not following the functional form in (14) given that neither β_1 nor β_2 follow the projected investment paths. β_3, on the other hand, appeared with the expected sign at statistically significant levels in both Mexico and Turkey.

<Insert Table 1 here>

When looking at the cash flow variables (β_4), we see that the results both confirm and to some extent challenge the initial hypothesis. Accordingly, in the case of Mexico a negative relationship is found between current financial profits and fixed investment spending at a significant level. In contrast, the current and lagged operational profits variable is found to be significantly positive suggesting the presence of capital market imperfections in line with others. When looking at the lagged values of financial profits we found it to be positive although with a much weaker economic effect compared to the operational profits variable. Furthermore, when analyzing the joint effect of current and past values of financial and operational profits, we found a negative and insignificant overall effect of FK_t and FK_{t-1} as revealed by the sum of the coefficients and a positive effect of OK_t and OK_{t-1}.

In the case of Turkey, however, we found a positive relationship between both current and past financial profits and fixed investment spending as implicitly assumed by the previous research. Similarly, the current and past operational profits variables are also found to have a significantly positive effect on new fixed investments as in Mexico suggesting the presence of capital market imperfections. Comparatively speaking, however, the joint effect of current and past financial profits is found to be four and a half times smaller than the operational profits.

The results suggest that financial profits do actually have different effects on new investment decisions of real sector firms compared to operational profits, especially with respect to current period cash flow variables. Yet, financial profits also appeared to provide a hedging mechanism by

providing additional cash flow in the subsequent periods as shown by the positive coefficient on the lagged *FK* variable. In both cases, the positive economic effect seems to be much smaller than the one on *OK* and is indeed negative on a net basis in Mexico.

The reason for the positive financial profits variable in Turkey may be the fact that financial profits as well as financial investments account for a larger share of the profit and capital structure of Turkish firms than Mexican counterparts. Accordingly, as of 2001 the financial revenues to net profits ratio was 547 with an average of 112 between 1990 and 2002 for the top 500 manufacturing firms (ISO). According to our sample too, the mean financial profits to net sales ratio appears to be fluctuating from around 10% to as high as 65% with sudden jumps during times of financial crisis and turmoil. Also, comparatively Turkey has a higher financial assets (I^f/K) and FK_{it} ratios compared to Mexico (Table 4).

In addition, we also examined the effects of profitability expectations as measured by the past rates of returns on fixed and financial assets (i.e. r^k_{t-1} and r^f_{t-1} respectively). The question we asked is apart from releasing financial constraints, whether increasing cash flow also signals the firm's future investment opportunities and therefore affect the results in Table 1. The results in Table 2 show that in Mexico past rates of return on financial assets have a significantly negative effect on current period's fixed investment spending. In contrast, the rate of return on fixed assets is found to have a significantly positive effect. On the other hand, in the case of Turkey both variables appeared with a positive sign suggesting that expected financial investment profitability has the same effect on fixed investment spending as the profitability of real sector activities. A closer look, however, reveals that the size of r^f is 480 times smaller than the r^k, suggesting significant economic differences in their respective effects on fixed investment spending.

Nevertheless, if there are no frictions within the firm that prevent resource pooling (i.e. separate departments in charge of fixed and financial investment decisions), there is no reason why a particular firm cannot pull all of its cash flow from real and financial sector activities together and

reallocate the aggregate cash flow to investments in different types of assets. If this is the case, then the coefficient on financial profits variable in Table 1 may be reflecting only the differential impacts of the rates of return on fixed and financial assets. Therefore, once controlled for the rate of return on financial assets, the cash flow from financial investments may be expected to have the same sign as those from real sector operations. In column (3) of Table 2 we checked for this possibility by controlling the effects of rates of return on financial assets when re-examining the effects of cash flow. The results show that once controlled for the negative effect of rates of return on financial assets, the cash flow from financial investments have a robust positive effect in both countries.

<Insert Table 2 here>

Moreover, in order to see if there are any differences between small and large firms in their investment response to financial and operational profits, we have divided the sample into two using firm size based on the median sales in the sample. We then constructed a small-firm dummy that took the value of one if real net sales at time *t* were smaller than the sample median. Consistent with Gelos and Werner (2002) and Leaven (2003) the results from Table 3 suggest that large firms in both Mexico and Turkey faced an increasing credit squeeze during the 1990s as shown by their higher sensitivity of fixed investment to operational profits. In other words, large firms are found to be more dependent on internal funds than small firms that may be due to the elimination of directed credits after financial liberalization.

<Insert Table 3 here>

We also found that increasing financial profits have a larger fixed-investment depressing effect in large Mexican firms. In fact, financial profits appear to have a positive effect on fixed investment spending of small Mexican firms. Similarly, in the case of Turkey, financial profits have a more positive effect on fixed investment spending of small firms. We can offer two contesting arguments to explain such differences between small and large firms in both countries: a) the effect of financial profits on fixed investment may be smaller for large firms since they already had better

diversification of their investment portfolios prior to financial liberalization; or b) while small firms use cash flow from financial investments as an extra source of internal funding, large firms utilize such profits for acquiring new financial investments (given their better access to different investment options) to the extent they reflect increasing opportunity cost of real sector activities. The fact that financial profits actually have a negative coefficient for large Mexican firms provides more support to the second explanation, which suggests that large firms are less likely to use profits from such investments to finance fixed investment projects.

7. Conclusion

The financial liberalization wave of the 1990s and the following integration of global capital markets opened new venues for portfolio diversification of real sector firms including the possibility to invest in non-real sector activities such as those in financial markets. Given this observation, the current paper revisited the capital market imperfections debate using some of the insights of portfolio theory of capital and the financialization view. Accordingly, we have tested the impacts of financialization of real sectors of the economy as well as the persistence of capital market imperfections in two major emerging markets after financial liberalization. The empirical results using firm level data confirm the findings of other papers by showing the persistence of credit constraints for real sector firms. In addition, the key contribution of this paper has been to show that in the presence of multiple investment options the availability of internal funds is a necessary but not sufficient condition for financing fixed investments. Accordingly, the source of funds is as much important as the availability of funds themselves given the differential impacts of profits from fixed and financial assets in our results. Although in theory the increasing share of financial assets in the portfolios of real sector firms may play a positive role in hedging risks and increasing profitability and therefore in increasing overall efficiency, our results provide little support for this.

Accordingly, the reason why we may find a negative or insignificant cash flow variable in reduced form investment equations is not so much because of a lack of capital market imperfections but because of the measurement of the cash flow itself. Furthermore, given the availability of countless investment opportunities in the financial markets, the results suggest that empirical investment modelling should control for the portfolio choice problem of real sector firms. In this era of financial globalization, we may as well see an increase in the number of real sector firms whose primary activity is to engage in financial investments not limited to hedging concerns.

Key policy recommendations of this paper to increase real investment rates in emerging markets include: a) elimination of capital market imperfections and opening up of long-term credit channels for fixed investment projects, b) providing macro and microeconomic stability that helps reduce market volatility and increase planning horizons of real sector firms, c) reducing real interest rates that not only depresses real investment and credit availability but also lures firms to engage in riskless financial investments.

For further research, in order to see if the above findings are limited to Mexico and Turkey we need to repeat the analysis with other developing countries as well despite certain problems regarding data availability. Secondly, applying this analysis to developed countries would help clarify any possible differences in the reactions of developed and developing country real sector firms to financial liberalization and emergence of multiple investment options outside real sector activities.

Bibliography

Abel, A. (1980). "Empirical Investment Equations: An Integrative Framework." In On the State of Macroeconomics, edited by K. Brunner and A. Meltzer, pp.39-93. Carnegie-Rochester Conference Series 12.

Abel, A., O. Blanchard. (1986). "The Present Value of Profits and Cyclical Movements in Investment." Econometrica 54, 249-274.

Aizenman, J., and N. Marion. (1999). "Volatility and Investment: Interpreting Evidence from Developing Countries." Economica 66, 157-179.

Arellano, M., S. R. Bond. (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." Review of Economic Studies 58, 277-297.

Blundell, R., S. Bond, and C. Meghir. (1992). "Econometric Models of Company Investment." In The Econometrics of Panel Data, edited by L. Matyas and P. Sevestre, pp. 388-413. Netherlands: Kluwer Academic Publishers.

Bond, S., and C. Meghir. (1994). "Dynamic Investment Models and the Firm's Financial Policy." Review of Economic Studies 61, 197-222.

Bond, S., and M. Dewereux. (1990). "Economic Analysis of Company Accounts." Investigaciones Economicas 14, 47-62.

Brock, P. L., and L. Rojas-Suarez. (2000). "Understanding the Behavior of Bank Spreads in Latin America." Journal of Development Economics, 63; 113-134.

Crotty, J. (2005). The Neoliberal Paradox: The Impact of Destructive Product Market Competition and 'Modern' Financial Markets on Nonfinancial Corporation Performance in the Neoliberal Era." In Financialization and the World Economy, edited by G. Epstein, pp. 77-110. Massachusetts: Edward Elgar.

Devereux, M. B., and G.W. Smith. (1994). "International Risk Sharing and Economic Growth." International Economic Review 35, 535-551.

Devereux, M. B., and F. Schiantarelli. (1990). "Investment, Financial Factors and Cash Flow from UK Panel Data." In Asymmetric Information, Corporate Finance and Investment, edited by G. Hubbard, pp 279-306. Chicago: University of Chicago Press.

Driver, C., and D. Moreton. (1991). "The Influence of Uncertainty on UK Manufacturing Investment." Economic Journal 101, 1452-1459.

Dumenil, G,. and D. Levy. (2005). "Costs and Benefits of Neoliberalism: A Class Analysis". In Financialization and the World Economy, edited by G. Epstein, pp. 17-45. Massachusetts: Edward Elgar.

Durham, J. B. (2002). "The Effects of Stock Market Development on Growth and Private Investment in Lower-Income Countries." Emerging Markets Review 3, 211-232.

Economic Intelligence Unit. (2003a). "Country Finance, Mexico." Economic Intelligence Unit.

Economic Intelligence Unit. (2003b). "Country Finance, Turkey." Economic Intelligence Unit.

Edwards, J., J. Kay, and C. Mayer. (1987). The Economic Analysis of Accounting Profitability. Oxford: Clarendon Press.

Edwards, S. (1989). "Real Exchange Rate in the Developing Countries: Concepts and Measurement." NBER Working Paper 2950.

Epstein, G. A., and A. Jayadev. (2005). "The Rise of Rentier Incomes in OECD Countries: Financialization, Central Bank Policy and Labor Solidarity." In Financialization and the World Economy, edited by G. Epstein, pp. 46-74. Massachusetts: Edward Elgar.

Fazzari, S., R. G. Hubbard, and B. C. Petersen. (1998). "Financing Constraints and Corporate Investment." Brookings Papers on Economic Activity 1, 141-195.

Federer, J. (1993). "The Impact of Uncertainty on Aggregate Investment Spending." Journal of Money, Credit and Banking 25, 30-48.

Gabriele, A., K. Boratav, and A. Parikh. (2000). “Instability and Volatility of Capital Flows to Developing Countries.” The World Economy 23, 1031-1056.

Gelos, G., and A. Werner. (2002). “Financial Liberalization, Credit Constraints and Collateral: Investment in the Mexican Manufacturing Sector.” Journal of Development Economics 67, 1-27.

Gilchrist, S., and C. Himmelberg. (1998). “Investment, Fundamentals and Finance.” In NBER Macroeconomics Annual, edited by N. S. Bernanke and J. Rotemberg, Cambridge, MA: MIT Press.

Goldberg, L., B. G. Dages, and D. Kinney. (2000). “Foreign and Domestic Bank Participation in Emerging Markets: Lessons from Mexico and Argentina.” NBER Working Paper 7714.

Grabel, I. (1995). “Assessing the Impact of Financial Liberalization on Stock Market Volatility in Selected Developing Countries.” The Journal of Development Studies 31, 903-917.

Hausmann, R., and M. Gavin. (1995). Overcoming Volatility. Special Report, Economic and Social Progress in Latin America. Washington D.C.: Inter-American Development Bank.

Hayashi, F., and T. Inoue. (1995). “The Relationship between Firm Growth and Q with Multiple Capital Goods: Theory and Evidence from Panel Data on Japanese Firms.” Econometrica 59, 731-753.

Henry, P.B. (2000). “Do Financial Market Liberalizations Cause Investment Booms?” Journal of Financial Economics 58, 301-334.

Huang, C., and R. H. Litzenberger. (1988). Foundations for Financial Economics. Amsterdam The Netherlands: North-Holland.

Hubbard, G. (1998). “Capital Market Imperfections and Investment.” Journal of Economic Literature 36, 193-225.

International Monetary Fund (IMF). (1995). Mexico: Recent Economic Developments. Washington D.C.: IMF Staff Country Reports.

International Monetary Fund (IMF). (2006). Global Financial Stability Report. Washington D.C.: IMF.

ISO (Istanbul Chamber of Industry). Top 500 Manufacturing Firms Survey. Various Issues, Istanbul: ISO.

Jensen, M., and W. Meckling. (1976). "The Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." Journal of Financial Economics 1, 247-259.

Laeven, L. (2003). "Does Financial Liberalization Reduce Financing Constraints?" Financial Management 32, 5-34.

Le, Q. V. and P. J. Zak. (2006). "Political Risk and Capital Flight." Journal of International Money and Finance 25, p. 308-329.

Mairesse, J., B.H. Hall, and B, Mulkay. (1999). "Firm Level Investment in France and The United States: An Exploration of What We Have Learned in Twenty Years." NBER Working Paper 7437.

McKinnon, R.I. (1973). Money and Capital in Economic Development. Washington D.C.: Brookings Institution.

Modigliani, F., and M. H. Miller. (1958). "The Cost of Capital, Corporation Finance and the Theory of Investment." American Economic Review 48, 261-297.

Moreno, R., and A. Villar. (2005). "The Increased Role of Foreign Bank Entry in Emerging Markets, BIS Papers 23, 9-17.

Myers, S. C., and N. S. Majluf. (1984). "Corporate Financing and Investment Decisions when Firms have Information that Investors do not have." Journal of Financial Economics13, 187-221.

Obstfeld, M. (1994). "Risk Taking, Global Diversification and Growth." American Economic Review 84, 1310-1329.

Peek, J., and E. S. Rosengren. (2000). "Implications of the Globalization of the Banking Sector: the Latin American Experience." Federal Reserve Bank of Boston New England Economic Review September/October, 45-62.

Pindyck, R., and A. Solimano. (1993). “Economic Instability and Aggregate Investment.” In NBER Macroeconomics Annual, edited by O. J. Blanchard and S. Fischer, pp.259-302. Cambridge: MIT Press.

Rojas-Suarez, L., and S. Weisbrod. (1996). “Building Stability in Latin American Financial Markets.” Working Paper no.320 (February), Wshington D.C.: Inter-American Development Bank.

Sancak, C. (2002). “Financial Liberalization and Real Investment: Evidence from Turkish Firms.” IMF Working Papers 02/100.

Serven, L. (1998). “Macroeconomic Uncertainty and Private Investment in LDC: An Empirical Investigation.” Mimeo, Washington D. C.: The World Bank.

Shaw, E. S. (1973). Financial Deepening in Economic Development. New York: Oxford University Press.

SPK (Capital Markets Board of Turkey). (2004). “Trading Volume in Secondary Markets.” Monthly Bulletin. Ankara: Ankara.

Stiglitz, J. E., and A. Weiss. (1981). “Credit Rationing in Markets with Imperfect Information.” American Economic Review 71, 393-410.

Tornell, A. (1990). “Real vs. Financial Investment: Can Tobin Taxes Eliminate the Irreversibility Distortion?” Journal of Development Economics 32, 419-444.

United Nations Conference on Trade and Development (UNCTAD). (2005). World Investment Report. Geneva: Unctad.

Weller, C. E. (2001). “Financial Crises after Financial Liberalization: Exceptional Circumstances or Structural Weakness?” The Journal of Development Studies 38, 98-127.

White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix and a Direct Test for Heteroskedasticity. Econometrica 4, 817-838.

World Development Indicators (WDI). Several Issues, Washington D.C.: World Bank.

Appendix

1. Measurement Issues and Generally Accepted Accounting Principles (GAAP)

1.1. Measurement under Mexican GAAP

Since 1984 Mexican GAAP requires firms to apply inflation accounting in balance sheets and income statements to correct for the effects of inflation. As a result of the price-level inflation accounting system, average Consumer Price Index (INPC) is used in calculating biannual values for each period. In converting to real prices, Producer Price Index (INPP) period average is used for net sales, operational profits, net profits before taxes and financial profits in the income statements, while INPP end-of-period values are used for net fixed and financial assets in the balance sheets. The manufacturing firms in the dataset represent 36% of total manufacturing sales in 2003.

1.2. Measurement under Turkish GAAP

For Turkish manufacturing firms, in converting to real prices, end of period manufacturing price index is used for financial and fixed assets in the balance sheets while for net sales, operational profits, and financial profits in the income statements manufacturing price index period averages are used. The firms in the dataset account for 22% of total manufacturing sales in 2003.

2. Data Definitions and Sources

FA_{it}: Financial Assets represents end of period financial assets the firm holds and includes current assets (cash, bank deposits, other current assets, cheques) and short-term investments (stocks, treasury bills, government bonds, private sector bonds, REPO and other short term investments).

FK_{it}: $FP_{it}/K_{i,t-1}$

FP_{it}: Financial Profits.

I^f/K_{it}: $FA_{it} / (FA_{it} + K_{it})$

K_{it}: Net Fixed Assets.

KO_{it}: Capital-output ratio measured as K_{t-1}(beginning fixed capital stock)/net sales.

OK_{it}: Operating Profits/$K_{i,t-1}$

r^k_{it}: Rate of Return on Fixed Assets measured as end of period operational profits (calculated as net sales minus cost of goods sold minus operating expenses) divided by net fixed assets (using the average of period beginning and ending net fixed assets as the denominator).

r^f_{it}: Rate of Return on Financial Assets calculated as FP_{it}/ FA_{it} (period averages).

2.1. Mexican firm level variables

All data are converted to fixed prices using the INPP at 2003 December prices from Banco de Mexico.

FA_{it}: Includes cash, short-term investments, and investment in other companies. In the company accounts, the investments in other companies (not affiliates) are restated for inflation (based on INPC) and recorded at current prices. The sum is expected to reflect total marketable and liquid monetary assets held by the firms.

FP_{it}: Includes net foreign exchange gain, financial income, and income from other financial operations. The income (net) from other financial operations includes gains (losses) from marketable securities and short term investments, profits (losses) from selling of shares on other companies, etc.

K_{it}: Includes net property, plant and equipment together and land given that land is not disclosed separately in the Economatica database. The data are at replacement cost till 1997 and at current prices since then. During the estimation, several methods, which are available from the author upon request, are applied to test for the consistency of this variable because of the change in its measurement.

2.2. Turkish firm level variables

All data are converted to fixed prices using Manufacturing Price Index at 1995 January prices from the Central Bank of Turkey.

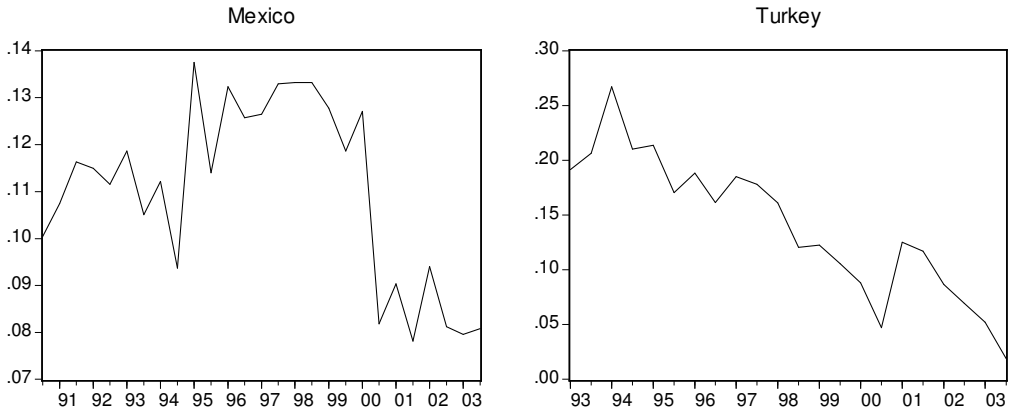
FA_{it}: Includes current assets (cash, bank deposits, other current assets, cheques) and short-term investments (stocks, treasury bills, government bonds, private sector bonds, REPO and other short term investments). We did not include long-term financial fixed assets in other firms given that under Turkish GAAP the long-term financial fixed assets are recorded at historical cost.

FP_{it}: Includes dividend income from subsidiaries and affiliates plus interest income and other dividends, plus other income from other operations, net of losses and expenses from other operations. Other income from other operations account included gains from foreign exchange fluctuations as well as other types of income such as from swaps etc.

K_{it}: Includes all existing capital stock net of depreciation excluding land (which is not subject to depreciation and is recorded at historical cost without revaluation).

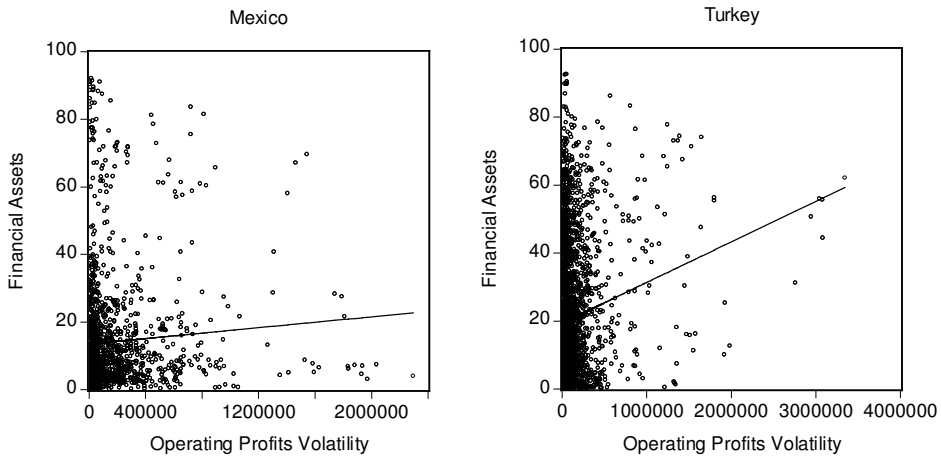
<Insert Table 4 here>

Figure 1: Operating Profitability



Note: Operating profitability is the operating profits to net sales ratio.

Figure 2: Financial Assets vs. Operating Profits Volatility



Note: Financial assets variable is the share of financial assets in total financial and fixed assets. Operating profits volatility is defined as the *t -/+2* moving standard deviation of operating profits at constant prices.

Table 1: Fixed Investment and Cash-flow Relationship Revisited

	Mexico						*Turkey*					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
I_{t-1}	-0.241***	-0.25***	-0.238***	-0.212***	-0.23***	-0.213***	-0.086***	-0.091***	-0.091***	-0.073***	-0.095***	-0.078***
	(0.022)	(0.019)	(0.023)	(0.023)	(0.023)	(0.022)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.003)
I^2_{t-1}	0.014	0.020**	0.029*	0.012	0.015	0.017	-0.010***	-0.009***	-0.010***	-0.013***	-0.018***	-0.01***
	(0.014)	(0.009)	(0.016)	(0.017)	(0.017)	(0.016)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
KO_{t-1}	-0.043***	-0.048***	-0.047	-0.038***	-0.04***	-0.037***	-0.074***	-0.076***	-0.077***	-0.06***	-0.051***	-0.051***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)
FK_t	-0.05***		-0.05				0.01***		0.004***			
	(0.024)		(0.05)				(0.001)		(0.001)			
FK_{t-1}		0.015*	0.008					0.013***	0.012***			
		(0.008)	(0.036)					(0.001)	(0.001)			
OK_t				0.149***		0.121***				0.045***		0.05***
				(0.028)		(0.047)				(0.002)		(0.003)
OK_{t-1}					0.059	0.066***					0.033***	0.022***
					(0.041)	(0.024)					(0.001)	(0.001)
sargan	1	1	1	1	1	1	0.999	0.999	0.999	0.999	0.999	1
m1	0	0	0	0	0	0	0	0	0	0	0	0
m2	0.944	0.944	0.83	0.807	0.864	0.846	0.362	0.352	0.351	0.317	0.341	0.321

Note: The dependent variable is the I_{it} from equation (20). I_{t-1} is net fixed investment by firm i at time $t-1$, KO is capital-output ratio measured as inverse of Y/K, FK and OK are financial profits and operational profits to capital stock ratios. All regressions include a set of (unreported) time dummies. *Sargan* is Sargan-test for overidentifying restrictions. *m1* and *m2* are is first and second-order serial correlation tests. Standard Errors (in parenthesis) are heteroskedasticity consistent. (***), (**), (*) refer to significance at 1, 5 and 10 percent level respectively.

Table 2: Rates of Return and Fixed Investment

	Mexico			*Turkey*		
	(1)	(2)	(3)	(1)	(2)	(3)
I_{t-1}	-0.223***	-0.233***	-0.239***	-0.073*	-0.077***	-0.082***
	(0.021	(0.021)	(0.021)	(0.004)	(0.004)	(0.005)
I^2_{t-1}	0.013	0.03	0.033	-0.007**	-0.012***	-0.011***
	(0.013)	(0.024)	(0.021)	(0.003)	(0.002)	(0.004)
KO_{t-1}	-0.039***	-0.044***	-0.046***	-0.042*	-0.067***	-0.074***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
r^k_{t-1}	0.109***			0.048*		
	(0.035)			(0.002)		
r^f_{t-1}		-0.004***	-0.004***		0.0001***	-0.0001
		(0.001)	(0.001)		(0.00003)	(0.0001)
FK_{t-1}			0.036			0.006***
			(0.038)			(0.001)
sargan	1	1	1	0.999	0.999	1
m1	0	0	0	0	0	0
m2	0.864	0.907	0.911	0.289	0.311	0.302

Note: r^k_t and r^f_t are the rates of return on fixed and financial assets. For other variables refer to Table 1.

Table 3: Fixed Investment and Cash-flow Relationship in Small versus Large Firms

	Mexico		*Turkey*	
	(1)	(2)	(1)	(2)
I_{t-1}	-0.244***	-0.242***	-0.102***	-0.098***
	(0.024)	(0.023)	(0.004)	(0.003)
I^2_{t-1}	0.018	0.015	-0.019***	-0.008***
	(0.018)	(0.015)	(0.004)	(0.002)
KO_{t-1}	-0.043***	-0.046***	-0.065***	-0.08***
	(0.005)	(0.005)	(0.006)	(0.005)
OK_{t-1}	0.189*		0.043***	
	(0.101)		(0.002)	
$(OK*D^{Small})_{t-1}$	-0.045		-0.019***	
	(0.077)		(0.003)	
FK_{t-1}		-0.054		0.009***
		(0.124)		(0.001)
$(FK*D^{Small})_{t-1}$		0.122		0.007***
		(0.125)		(0.001)
sargan	1	1	1	1
m1	0	0	0	0
m2	0.748	0.896	0.352	0.378

Note: For variable definitions refer to Table 1. D^{small} is a size dummy that takes that takes the value of one if net sales at time *t* are smaller than the sample median.

Table4: Summary Statistics

Mexico	*I*	*KO*	*OK*	*FK*	r^k	r^f	I^f/K
Mean	0.012	1.963	0.110	0.015	0.107	-0.242	14.328
Median	-0.001	1.568	0.071	0.004	0.071	0.037	8.041
Maximum	2.150	16.561	4.589	3.936	3.377	11.018	92.120
Minimum	-1.289	0.032	-2.323	-1.304	-2.387	-22.415	0.075
Std. Dev.	0.238	1.602	0.302	0.171	0.278	1.779	17.490
Turkey	*I*	*KO*	*OK*	*FK*	r^k	r^f	I^f/K
Mean	0.013	0.607	0.492	0.244	0.530	1.532	0.211
Median	-0.002	0.421	0.297	0.077	0.328	0.385	0.145
Maximum	2.176	8.545	8.402	14.564	8.053	92.684	0.926
Minimum	-2.554	0.005	-5.252	-4.696	-5.153	-53.798	0.000
Std. Dev.	0.255	0.658	0.773	0.808	0.754	6.725	0.197

Note: I is net fixed investment, KO is capital-output ratio OK is operational profits to capital stock ratio, FK is financial profits to capital stock ratio, r^k and r^f are rates of returns to fixed and financial assets, I^f/K is the financial assets to financial assets plus net fixed assets ratio.