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2007

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Abstract

Using micro level panel data, we analyze the impacts of rates of return gap between fixed and financial investments under uncertainty on real investment performance in three emerging markets, Argentina, Mexico and Turkey. Employing a portfolio choice model to explain the low fixed investment rates in developing countries during the 1990s, we suggest that rather than investing on risky and irreversible long term fixed investment projects, firms may choose to invest on reversible short term financial investments depending on respective rates of returns and uncertainty in the economy. The empirical results show that increasing rates of return gap and uncertainty have an economically and statistically significant fixed investment reducing effects in all three countries while the opposite is true with respect to financial investments.

JEL Classification Codes: E22, O16, D21, G11, C33

Keywords: Private Investment, Portfolio Choice, Uncertainty, Financialization

[1] I am thankful to Jaime Ros, Amitava K. Dutt, Kwan S. Kim, Kajal Mukhopadhyay, Jiandong Ju, Kevin Grier, Roberto Frenkel, Bernardo Kosacoff, Paquita Y. Davis-Friday, Emery Ventura of Economatica, and session participants at ASSA 2007 meetings in Chicago for their helpful comments and suggestions. For financial support, I thank the Helen Kellogg Institute for International Studies. All opinions and remaining errors are mine.

1. Introduction

The effects of uncertainty and risk on investment performances of developing countries have been of particular interest in the recent economics literature especially given the declining fixed capital formation rates in major developing countries during the 1990s (Unctad, 2003). As a result, there is a growing research analyzing the potential effects of macro and microeconomic volatility and uncertainty on private investment performance in both developed and developing countries. In this respect the empirical work so far suggests a general consensus on the negative effects of uncertainty, risk and volatility on investment performance in both groups of countries.

Nevertheless, there are relatively few empirical studies exploring the channels through which uncertainty affects investment. In particular, the interactions among fixed investment, uncertainty, and portfolio choice remain an unexplored field of research. The absence of empirical research on the portfolio choice problem real sector firms face is surprising given the increasing integration of international goods and capital markets and the widening gap between the real and financial sector transactions where annual foreign exchange (FX) trading to world trade ratio has reached 90/1 in 2004 from 2/1 in 1973 (BIS, 2004).

The current paper is the first empirical study that looks into the portfolio choice problem real sector firms in developing countries face between real and financial sector activities. Accordingly, it is argued that following financial liberalization real sector firms face a portfolio choice problem in their investment decisions between two broad categories of assets that are fixed and financial assets. In the face of these two investment options, increasing risk and uncertainty when combined with capital market imperfections, higher real interest rates, and increasing rates of return in the financial markets may encourage short-term financial investments over long term fixed investment projects. In other words, increasing availability *and* accessibility of alternative investment opportunities in the financial markets when combined with domestic market rigidities and uncertainty may become instrumental in channelling real sector savings to short-term financial investments instead of long-term fixed capital formation and thus lead to deindustrialization in these economies.

The portfolio choice problem and the optimum allocation of resources under multiple investment options faced by real sector firms is not a new topic in the economics literature. Tobin (1965), for example, already pointed out the substitutability of real and financial investments. Accordingly, depending on the respective rates of returns investors may prefer to invest in real or financial assets, and as a result financial investments at times may crowd out real investment projects. Likewise, Tornell (1990) argued that given the uncertain environment in developing countries, real sector firms may prefer to invest in more liquid *reversible* assets in the financial sectors that also offer comparable or higher rates of return on their investments rather than on *irreversible* fixed assets. Moreover, Blanchard et al. (1993) pointed out that when market valuation of an investment project is greater than the firm's own valuation, instead of issuing new shares and investing the proceeds until the marginal product of capital is equal to that offered by the market, the best strategy would be to use the proceeds not for physical investment, "but for lending at the riskless rate: for example, to buy Treasury bills. This is because investing in capital drives down its marginal product, while lending at the riskless rate is equivalent to investing in a constant returns technology" (p.118). However, despite such insights, there was no empirical study looking into this question of substitution between real and financial assets by real sector firms. Only recently, there is a growing body of research exploring this issue that can be referred as the *financialization* literature that focus on the following key points: i) increasing rate of return on financial capital over and above the rate of return on fixed capital, ii) increasing acquisition of short term financial assets by the real sector firms, and iii) decreasing fixed investment rates. In this respect, using macroeconomic data Stockhammer (2004), Crotty (2005), Dumenil and Levy (2005), Epstein and Jayadev (2005) have provided empirical evidence on this structural change in the portfolio allocation decisions of non-financial corporations in the US, UK, France, Germany, and other high income OECD countries.

In contrast, the empirical research on financialization in the case of developing countries is non-existent. Startlingly, the same is true for the empirical studies on uncertainty and investment relationship in emerging markets especially with regard to the portfolio approach to investment

decisions. Therefore, while the current paper extends these two lines of research along the portfolio choice, and investment-uncertainty relationship, it is unique in its approach on three points. First of all, it is the first study that focuses on the experiences of developing countries using empirical evidence from three major emerging markets that are Argentina, Mexico and Turkey. Secondly, unlike others it explores the above questions using firm-level data for all publicly traded real sector firms. Employing firm level data not only allows us to analyze the changes in the investment decisions and portfolio allocation of real sector firms at the micro level but also enables the measurement of firm specific investment and profitability ratios on fixed and financial investments rather than using macroeconomic proxy variables. And finally, the dataset we employed is bi-annual that allows us to capture the immediate effects of changes in the profitability rates and uncertainty on the investment decisions and portfolio allocation of firms especially with regard to financial investments and profits.

The empirical analysis using firm level panels for each country separately provides strong support to the main hypothesis while identifying certain differences across countries. Briefly, in all three cases, we have found that growing rates of return gap between financial and fixed investment assets, and increasing uncertainty and risk in macroeconomic environment have an economically and statistically significant fixed investment retarding effect. In addition, we found that rising rates of return on financial assets over and above those on fixed assets encourage financial investments over fixed investments at an economically and statistically significant level. On the other hand, the effect of uncertainty and country risk on the share of financial investment in total assets, although economically and statistically significant, appeared to be a heterogonous one across countries. We believe these factors are of significant importance in explaining the deindustrialization process observed by Unctad (2003) in most Latin American countries and in Turkey for the last two decades.

The choice of these three countries is of no coincidence. Briefly, Argentina, Mexico, and Turkey appear as a trio where financial liberalization reforms were first started (together with Chile) and the experiences of which have formed the basis of the arguments on globalization and liberalization of markets in the developing world. The following figures also help emphasize the

relative importance of these three countries among other emerging markets: Argentina and Mexico attracted 42% of total Foreign Direct Investment (FDI) flows, 56% of total International Monetary Fund (IMF) credit and 43% of total portfolio flows to Latin America between 1980-2000. Furthermore, during 1990-1994 and 1990-2000 Argentina, Mexico and Turkey together received 53 and 38% of total portfolio flows to middle and lower income countries in the world. In fact, Turkey itself received 23 cents out of every dollar invested in middle income countries in the form of portfolio investment in 2000. Moreover, Turkey is not only the largest debtor of IMF accounting for 46% of the total outstanding credits and loans from the General Resources Account, but also has the highest quota/usage ratio from this account with 1011% of its quota as of 2006.

These three countries have been the forerunners of economic liberalization in developing countries starting from early 80s and 90s. However, despite the fact that each of them were portrayed as a success story at the early stages of the reforms, the ensuing economic performances have been far from initial expectations. In this respect, their experiences may have important policy implications for other developing countries going through similar adjustments in their economic foundations. In retrospect, the economic landscapes of all three countries, starting from late 1950s to mid and late 1970s were characterized by an Import Substituting Industrialization regime the main features of which included strict quantitative controls on international trade, overvalued exchange rates, and severe rationing in both foreign exchange and credit markets. Among the trio, Turkey was the first that embarked on the structural adjustment and stabilization program of IMF and World Bank (WB) starting from early 80s in the aftermath of a serious Balance of Payments (BOP) crisis and emerged as a test case for the newly implemented WB-IMF joint programme involving cross conditionality (Demir, 2004). The final stage of restructuring was in 1989 with the liberalization of its capital account of BOP. On the other hand, Argentina and Mexico entered the 1980s with a much less favorable environment resulting from the debt crisis of 1982 and the ensuing fall in external financing. Both countries were cut from international financial community and faced large contraction in their economies accompanied by hyperinflation. The unorthodox Pacto agreement in 1987 for inflation

stabilization and debt restructuring under Brady Plan in 1989 released the external constraints for Mexico. The accompanying liberalization program and the lifting of restrictions on foreign investment (including capital account liberalization in 1989) combined with the signing of NAFTA in 1993 led to a strong change of investor expectations towards Mexico. As a result (and partly thanks to low interest rates in the US) between 1990-93 net real short-term capital inflows by non-residents (RSCF) totaled $105 billion compared to -63 billion dollars between 1982-89. The net RSCF and real Foreign Direct Investment (RFDI) inflows have reached $146 and $203 billion between 1990 and 2005. Similarly, Argentina also embarked on this new wave with restructuring its debt in 1993 under Brady agreement and started a semi-currency board system with the approval of IMF to control inflation and stabilize the economy under the Convertibility regime by fixing exchange rate to dollar and abolishing all exchange and capital controls in 1991.[1] Although in a smaller scale, Argentina was also successful in attracting RSCF, which increased from a net of –9 billion dollars between 1982-89 to $27 billion during 1990-93. Total RSCF and RFDI inflows reached $50 and $97 billion during 1990-2005. Similarly, Turkey attracted considerable sums of short term inflows after capital account liberalization that reached $120 billion during 1990-2005 although with a much limited inflows of FDI that totalled $26 billion for the same period.

However, despite comprehensive liberalization programs and the accompanying radical increase in both short and long term capital inflows, comparatively low fixed capital formation rates in all three countries during the 1990s and 2000s remain an important issue and a significant source of puzzlement for policy makers (Unctad, 2003:XI). In fact, the steadily declining fixed capital formation rates led Unctad (2003) to include Argentina, Mexico and Turkey in the group of deindustrilizers among other developing countries. While the gross fixed capital formation as a percentage of GDP fell from an average of 20 and 21% to 17 and 19% between 1980-89 and 1990-05 in Argentina and Mexico, it stagnated at the same level of 22% in Turkey. These rates are below the 25% minimum

[1] The official date of capital account liberalization was in 1989 when restrictions on the movement of capital to and from Argentina were lifted.

that Unctad (2003:61) identified as the required threshold to generate high and sustained growth in middle-income developing countries.

The current study focuses on three key elements of the recent development experience in these countries that we think have significant explanatory power in understanding such disappointing investment performances amid comprehensive reform programs. The first one is the effects of alternative investment opportunities in the financial markets where rates of return has at times exceeded those from long term fixed investment projects. The second element is the reaction of private sector investments to uncertainty and risk in key macro prices in the face of alternative investment opportunities in financial sectors. And the third one is the persistence of capital market imperfections and lack of long term credit availability.

The next section presents a brief review of the literature on the effects of financial liberalization, uncertainty and capital market development on private investment behavior. The third section introduces the theoretical model and key hypotheses of interest followed by a discussion of the data, methodology and estimation issues. The fifth section presents the main results from empirical analysis. The final section offers an overall discussion of the findings and concludes the paper.

2. Analytical framework

2.1. Financial liberalization, uncertainty and private investment

In several emerging markets financial liberalization has been accompanied by sharp fluctuations in key macro and micro prices together with increasing uncertainty. Kose et al. (2003), for example, found an increase in consumption volatility in emerging markets during the 1990s. Furthermore, Gabriele et al. (2000: 1051) pointed out the 'high, rising and unpredictable" volatility of capital flows to developing countries during the 1990s compared to late 70s and 80s. The empirical evidence also shows an increase in the volatility of stock markets as well as in the sales and earnings of firms in both developed and developing country markets for the last three decades (Grabel, 1995; Comin and Mulani, 2006; Wei and Zhang, 2006). In the case of growth volatility, although it has declined across developed countries during the 1990s (McConnell and Perez-Quiros 2000), the

results are not uniform in developing countries. Montiel and Serven (2004) reported an increase in the growth volatility of one third of 77 developing countries they analyzed during the 1990s with an overall volatility twice higher in developing countries than the developed ones. In addition, there is substantial evidence suggesting that capital inflows may have a significantly negative affect on investment performance in the tradable goods sectors by distorting price signals because of changes in relative prices. Lustig and Ros (1999) and Frenkel and Ros (2006) pointed out the appreciation of domestic currencies resulting from capital inflows in Mexico, Argentina, and other Latin American countries that led to a shift in relative prices against tradables and brought about a profitability squeeze in the real sectors, which partly help explain the decreasing business savings and contraction of employment in the tradable goods sectors. In this respect, increasing volatility may also be self-exacerbating as the investors shorten their time horizons either to benefit from speculative gains or to avoid excess risk.

In the case of Argentina, Mexico and Turkey, we also see an increasing dependence on private short-term capital inflows as the engine of growth following financial liberalization. For example, the unconditional correlation coefficient between current account balance (CAB) and real GDP growth (RGDPG) rate (in absolute values) has been 0.73, 0.70, and 0.75 during 1990-93 while that of RSCF and RGDPG were 0.43, 0.97 and 0.62 for the same period. The overall correlation for 1990-2005 between CAB and RGDP has been 0.23, 0.26 and 0.70 while that of RSCF and RGDPG has been 0.32, 0.40 and 0.62 respectively. During this period, the volatility of annual RSCF in Argentina, Mexico and Turkey has also increased as seen from the 3, 2 and 3 folds increase in the coefficient of variation of such flows between 1982-1989 and 1990-2005.

The radical increase in the short term capital flows and its volatility can partly be explained by the availability of large arbitrage-gains in the financial markets of these economies with potentially dire consequences for fixed capital formation rates. Using the uncovered interest parity condition, we calculated the net arbitrage gain as the difference between domestic interest rates (i.e. 3-month T-bills)

deflated by the average depreciation of domestic currency, and the corresponding U.S. interest rates.[2] As a simple proxy, it shows the net rate of return on investing in domestic short-term financial assets as opposed to foreign ones. Accordingly, the monthly arbitrage gain from financial investments has increased from negative numbers during pre-liberalisation era to as high as 156, 259 and 482% in Argentina, Mexico and Turkey in March 2003, March 1995, and May 1994 respectively. Likewise, the annual average gain has been two and sometimes three digit numbers with an average of 9, 11, and 22% during 1991-2005 respectively. The real interest rates also remained very high in international standards at 6.2, 4.2 and 9.4% on average during 1991-2005 with annual average peaks being at 23, 9.4 and 23.8% in 2001, 1999, and 2002 in Argentina, Mexico and Turkey respectively. Given such high levels of gains in domestic financial markets, the simple correlation coefficient (in absolute values) between RSCF and net financial arbitrage has reached 0.65, 0.40 and 0.64 during 1990-1999 and 0.60, 0.91 and 0.44 during 2000-2005 respectively.

The presence of such large arbitrage gains appear to be one of the key reasons why both real and financial sector firms may prefer to invest in short-term financial assets, especially in the form of government debt securities. This process, which is most visible in Turkey, also led to serious currency and maturity mismatch in the balance sheets of real and financial sector firms as a result of borrowing from abroad in foreign currency with short-term maturities at low interest rates and then lending to the government. The real sectors join this cycle either directly by buying debt securities or via repurchase agreements intermediated through banks. For example, as of 2005, around 37% of total interest income of private commercial banks in Turkey came from public sector securities (TBB). Similarly, the share of financial revenues in overall profits of top 500 manufacturing firms in Turkey jumped up to 547% in 2001 from around 15% in 1982 (ISO).

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[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.

In the case of the effects of uncertainty and volatility on investment performance, the existing empirical research suggests an unambiguously direct link.[3] In both developed and developing countries, uncertainty and volatility in key macro and micro prices (including different measures of uncertainty in real GDP growth, real exchange rate, relative prices of capital goods, and inflation) are found to have an economically and statistically investment and growth reducing effect (Edwards, 1989; Driver and Moreton, 1991; Federer, 1993; Pindyck and Solimano, 1993; Hausmann and Gavin, 1995; Ramey and Ramey, 1995; Price, 1996; Serven, 1998; Aizenman and Marion, 1999; Grier and Grier, 2006).

2.2. Credit market development and private investment

Given the presence of capital market imperfections and rent-seeking behavior in the repressed financial markets, domestic and external 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 (McKinnon, 1973; Shaw, 1973). Likewise, increasing foreign presence was assumed to increase competition, and overall efficiency of the financial sectors. Consequently, increased credit availability, capital market deepening and a more efficient financial sector were expected to boost private investment and promote growth.

Nevertheless, in the case of Argentina, Mexico and Turkey the majority of empirical studies failed to uncover any evidence of efficiency gains for real sector firms following financial liberalization despite the increased foreign bank presence that reached over 80% in Mexico and 50% in Argentina and Turkey. Peek and Rosengren, (2000), in the case of banking sector in Latin America, showed that the increased share of total claims attributable to foreign banks came at the expense of domestically owned, private banks. In the case of credit availability, Goldberg et al. (2000) found little difference between domestic and foreign owned banks' loan behavior and the composition of loan

[3] In contrast, there is no consensus in the theoretical literature. As surveyed by Aiginger (1987) and Serven (1998), the existing research gives opposing results depending on assumptions regarding production technology, and irreversibility problems.

portfolios in Argentina. Similarly, following financial liberalization private firms in these three countries continued to face strict credit rationing and as a result had to finance their investment spending mostly from internal sources or from short term barrowing (Fanelli et al., 1998. p.41; Guncavdi et al., 1998; EIU, 2003a, p.13, 2003b, p.37,). The total bank credit to the private sector as a share of GDP actually declined in Argentina from an average of 26% between 1980-89 to 19% in 1990-99 and further to 16% in 2000-2005. In the case of Mexico and Turkey, it was 15 and 18% between 1980-89, 25 and 20% in 1990-99 and back to 16 and 20% in 2000-2005, which are all well below the high income OECD average of over 160% or South Korea's 100% (WB, 2007). As of 2005, for example, the share of short-term debt in total debt of top 500 manufacturing firms in Turkey was around 70% (ISO).

On the other hand, in the case of capital market deepening, 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). The same process is observed in the case of Turkey too where around 98% of secondary market transactions were of government securities in 2004 with an average of 88% during the course of 1990s (SPK, 2004).

3. Portfolio choice and changing patterns of specialization in the real sectors

As argued in the previous section, after more than two decades of financial liberalization strict credit rationing with insufficient funds for financing long-term investment projects continues to persist in Argentina, Mexico and Turkey. Stock markets, on the other hand, became increasingly volatile with sharp boom-bust cycles and failed to provide a continuous and reliable source of funds for private sector investment projects. Instead, the share of private sector securities in the composition of total financial assets has indeed decreased while the share of public sector securities increased.

Given this background, the question asked by Van der Hoven and Taylor, (2000) and Unctad (2003) that why domestic and external financial liberalization did not lead to investment growth in real sectors can be answered with a combination of all the factors discussed above. Accordingly, we

suggest that following the liberalization wave of the 80s and 90s private real sector firms adopted a portfolio view of investment and started to take into account the availability of relatively quick and high returns in the booming financial markets or in government debt instruments especially in the presence of the aforementioned bottlenecks and increasing uncertainty. In this picture the existence of large public debts (especially in Argentina and Turkey) that are financed through domestic capital markets at high real interest rates further contributed to the rise of this new class of financial investors who chose (quite rationally) short-term gains instead of risky long-term fixed investment projects. Hence, lack of long-term financing and other limitations and risks created by the uncertainty and volatility in key macro (and micro) prices might have brought about a transformation in the real sectors of the economy contributing to the rise of financialization of real sectors.

There is growing evidence showing this transformation in developed countries. 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 1950s and 60s to around 50% in 2001. During this period, NFC portfolio income to cash flow ratio also rose from around 14% in 1960s to around 37% towards the end of 90s in the US (Crotty, 2005, p.85,107). Likewise, according to Epstein and Jayadev (2005) the profits earned by firms engaged primarily in financial activities have risen over and above those of non-financial sector averages in all OECD countries between 1960-1970, and 1990s. In the case of Turkey, the average ratio of financial asset revenues in overall profits of top 500 manufacturing firm increased from around 23% between 1982 and 1989 to around 112% between 1990-2002.

3.1. A simple model of portfolio choice

Following the above discussion, this research is the first empirical attempt in the field to differentiate between different types of investment decisions (i.e. financial *vs.* real) that a *real sector* firm faces in a liberalized financial market. Using a modified version of the model by Huang and Litzenberger (1988), and Le and Zak (2006) and adopting the analytical framework of Tobin (1965) and Tornell (1990), we apply a portfolio choice model of investment to our analysis of asset allocation between fixed and financial assets by real sector firms. Accordingly, the 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 actually 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, $r^k \sim N(\mu, \sigma^2)$ (i.e. because of uncertainty regarding future profitability as well as irreversibility problem and adjustment costs). 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 US t-bills). This can also be interpreted as riskless financial asset return plus exchange rate risk and country risk (an increase in either of these risks increases the r^f). 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 the following problem:

$$\underset{W_t}{Max}\, E\sum_{t=0}^{\infty}\beta^t U(W_t) \tag{1}$$

subject to

$$W_t = (1+r_t^k)I_t^k + (1+r^f)I_t^f \tag{2}$$

if the initial wealth at time *0* is $W_0 = I_t^f + I_t^k$ then $I_t^f = W_0 - I_t^k$ that gives us (2'):

$W_t = (1+r_t^k)I_t^k + (1+r^f)(W_0 - I_t^k)$ that is

$$W_t = W_0(1+r^f) + I_t^k(r_t^k - r^f) \tag{2'}$$

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

Using (1) and (2') and applying the Stein's Lemma[4] the optimum allocation equation becomes:

$$I_t^{k*} = \frac{E(r_t^k - r^f)}{\gamma Var(r_t^k)} \tag{3}$$

taking natural logs of (3) at time *t* yields:

$$\ln(I_t^{k*}) = \ln(E(r_t^k - r^f)) - \ln \gamma - \ln(Var(r_t^k)) \tag{3'}$$

where $Var(r_t^k)$ is the variance of the rate of return on fixed investment 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.

Equation (3') suggest that new fixed investment spending of firms is a positive function of rates of return gap (r_t^k - r^f), between fixed and financial assets, and a negative function of economic uncertainty (assuming constant risk aversion).

In addition, the aggregate capital K^a_t invested in the economy includes both fixed and financial capital and therefore:

$$K_t^a = I_t^{k*} + I_t^f \tag{4}$$

where I_t^f denotes the total financial investments that comes out of equation (3).

Rearranging (4) and substituting I_t^{k*} from (3) gives us the equilibrium financial investment equation:

$$I_t^f = K_t^a - \frac{E(r_t^k - r^f)}{\gamma Var(r_t^k)} \tag{5}$$

If we divide both sides of equation (5) by K^a_t we get:

$$\frac{I_t^f}{K_t^a} = 1 - \frac{E(r_t^k - r^f)}{\gamma K_t^a Var(r_t^k)} \tag{5'}$$

If we take the natural log of both sides and approximate log(1-x) to log(-x) then we get:

[4] That is *Cov(g(x), y) = E (g'(x))Cov(x, y).*

$$\ln(\frac{I_t^f}{K_t^a}) = -\ln(E(r_t^k - r^f)) + \ln(\gamma) + \ln(Var(r_t^k)) + \ln(K_t^a) \quad (5'')$$

which shows that the share of financial assets in aggregate capital increases as: a) rate of return gap between fixed and financial investments (r_t^k - r^f) decrease, and b) economic uncertainty ($Var(r_t^k)$) increases (assuming constant risk aversion).

Based on (3') and (5'') the following hypotheses are to be tested separately for each country.

3.2. Hypothesis 1

We first test the impacts of the profitability of different types of investments (i.e. r_t^k *vs.* r^f), and uncertainty on new fixed investment decisions of private real sector firms. Thus, rather than employing a proxy variable, we in fact calculated the profitability rates of both fixed and financial investments for each firm in the dataset using detailed balance-sheet and income statement data. Secondly, we explored the effects of macroeconomic risk and uncertainty on new fixed investment spending in the face of multiple investment opportunities in fixed and financial assets.

The main argument in the previous section regarding the portfolio choice problem between fixed and financial investments can alternatively be analyzed using the standard theory of capital where investors face two types of costs: i) systemic risk from fixed investment that is subject to adjustment costs and uncertainty regarding future profitability and macro environment, and ii) liquidity premium and opportunity cost of fixed investment (that can be interpreted as the rate of return from financial investment). Unless rates of return from fixed investments are higher than other types (i.e. $r_t^k \geq r^f$), firms will postpone their fixed investment decisions.

In the empirical specification of investment model, using (3') we adopted a dynamic model including delivery lags and adjustment costs as in Bean (1981), Driver and Moreton (1991) and Price (1995)[5]. We then have:

$$I_{it}^k = \alpha_1 I_{it-1}^k + \alpha_2 KO_{it-1} + \alpha_3 Rgap_{it-1} + \alpha_4 Risk_t + \alpha_5 V_t + d_t + \varepsilon_{it} \quad (6)$$

[5] For alternative investment specifications and comparative analysis of different panel data techniques in econometric models of firm investment see Blundell et al. (1992) and Rama (1993).

where *i=1, …, N and t=1, …, T* respectively refer to the cross section and bi-annual time series elements of the data. Here d_t is a vector of time and sector fixed effects, and ε_{it} is the error term.

I^k_{it} is the real net fixed investment of firm *i* in year *t* and is measured by the standard logarithmic difference of net fixed capital stock at constant prices (Δk_{it}).[6]

KO_{it} is Capital/Output ratio from the standard investment theory where a decreasing *KO* ratio is expected to increase new investment. The lags in the response of investment spending to capital/output ratio result from the following: a) the role of expectations given that new investment depends on expected future sales which themselves rely on current and past sales, b) adjustments costs and delivery lags (Abel and Blanchard, 1986).

$Rgap_{it}$ is the rates of return gap between fixed and financial assets ($r_{it}^k - r_{it}^f$) where the latter captures not only the market signals regarding future profitability in non-operational activities but also the effects of opportunity costs of fixed investment. Increasing profitability of financial investments (r^f) is expected to divert resources away from long-term fixed investment projects and reduce new fixed investment spending. Thus, we expect *Rgap* to have a positive coefficient suggesting that rising rate of return gap in favor of fixed assets leads to higher levels of new fixed investment spending. The use of lagged variable in the estimation is due to the fact that the data are biannual and it is expected to take at least one period for the profitability signals to have an effect on long term fixed investment planning. It is worth noting that all previous research on the determinants of private investment has assumed that overall profitability has a uniform effect on fixed investment decisions independent of its components since the primary source of overall profits is presumed to be operational activities. In other words, for a real sector firm r_{it}^k has implicitly been assumed to have the same positive effect on fixed investment as r_{it}^f. However, the sign on financial profitability measure may in fact be negative given that it not only represents the opportunity cost of fixed investment under uncertainty and irreversibility problem but also the expected profitability of such investments in the future.

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

where δ is the depreciation rate, K_{it} is the net fixed assets , and log is the natural log.

$Risk_t$ refers to a vector of different country risk and macro uncertainty measures (i.e. $Var(r_t^k)$) (which are discussed in detail in the following section) and is expected to have a negative effect on new fixed investment spending.

V_t refers to a vector of control variables for sensitivity analysis including: i) Cr_t that is total credit from the banking sector to the private sector as a share of GDP to control for the effect of capital market imperfections and credit availability. We expect the increasing credit availability to enable and encourage new capital accumulation and thus the expected sign of the coefficient is positive. ii) Real GDP growth rate to control for aggregate demand changes as well as its affect on future economic outlook and is expected to be positively related with I^k_{it} suggesting that increasing aggregate demand and positive growth expectations encourages real sector firms to allocate more of their resources towards fixed assets.

3.3. Hypothesis 2

Hypothesis (1) and equations (3') & (5'') suggest that i) availability of rising returns in the financial markets, and ii) increasing levels of macroeconomic uncertainty and risk encourage reversible financial investments over risky and irreversible long-term fixed investments. Thus in addition to equation (6), using (5'') we also look at the changes in the portfolio allocations of real sector firms between fixed and financial assets in the face of these two factors:

$$\left(\frac{I^f}{K^a}\right)_{it} = fk_{it} = \alpha_1 fk_{it-1} + \alpha_2 fk_{it-2} + \alpha_3 K^a_{it} + \alpha_4 Rgap_{it-1} + \alpha_5 Risk_t + d_t + \varepsilon_{it} \qquad (7)$$

where $i=1, \ldots, N$ *and* $t=1, \ldots, T$ respectively refer to the cross section and time series elements of the data. Here d_t is a vector of time and sector specific fixed effects, and ε_{it} is the error term.

fk_{it} is the financial assets to aggregate capital ratio measured as net financial assets over net financial assets plus fixed assets as in (5'') representing the portfolio allocation decisions of real sector firms between these two types of assets. We have used lags in the specification given the dynamic nature of such liquid investments especially in a bi-annual dataset.

K^a_{it} is the aggregate capital stock measured as net financial assets plus net fixed assets and according to equation (5'') is expected to have a positive coefficient.

$Rgap_{it}$ refers to rate of return gap as in (6). We expect to find a negative coefficient suggesting that increasing rate of return on gap in favor of financial assets encourage firms to divert more of their investments towards financial assets.

$Risk_t$ is the same as in equation 6. We expect to find a positive relationship between the risk and uncertainty variables, and the fk_{it} ratio. Accordingly, with increasing (decreasing) risks and uncertainty firms will reallocate more (less) of their assets towards liquid financial assets rather than fixed assets. Unlike the *Rgap* variable, we used the current period risk measures rather than lagged values in both equations (6) and (7) given that the risk and uncertainty expectations have an immediate effect on investment planning and portfolio decisions of firms. In contrast, the realized profitability of investments is not readily available before the end of the period when the income statements are prepared or when the planned investments are finished and added to the existing capital stock.

4. Data, measurement and methodology

4.1. Data

The datasets are from the audited financial accounts of *all* publicly traded industrial firms in Argentina, Mexico and Turkey and are unbalanced. The period analyzed is biannual and cover 1992:2-2001:2 for Argentina, 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. Given the highly liquid nature of financial investments, a better choice would be to use quarterly data. Yet, given that quarterly financial statements are not subject to independent auditing in any of the three countries, we used biannual data. The data for Argentina and Mexico mostly came from Economatica, a database providing balance sheet data for publicly traded Latin American companies.[7] For Turkey the data set was obtained from the Istanbul Stock Exchange Market online database. In

[7] There are certain adjustments needed with the Economatica database a detailed summary of which and the correction methods are available from the author upon request.

some cases Worldscope International database and Datastream are also used for robustness and completeness. The firms included are all industrial firms with majority of them in manufacturing. For Mexico and Turkey, we have dropped those firms with less than eight consecutive data points from the dataset. For Argentina, we kept the minimum threshold level at five because of its smaller number of cross section firms.[8] For Argentina there are 65 firms in the final dataset with 51 in manufacturing (ISIC 15-37), 4 in construction (ISIC 45), 4 in mining (ISIC 10-14) and 6 in electricity power generation and distribution (ISIC 40). In the case of Mexico, there are 79 firms in the 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 177 firms with 2 in electricity and gas generation and distribution (ISIC 40, 41) and 175 in manufacturing (ISIC 15-37). The manufacturing firms in the sample accounted for 23, 36, and 22% of total sales in Argentina in 2001, and Mexico and Turkey in 2003 respectively. A description of the data (including summary statistics and correlation matrix), accounting and measurement issues is in the appendix.

4.2. Measurement of financial profits and assets

The financial profits variable is measured as the realized financial income net of financial expenses except interest cost for each firm separately. 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, other current assets) and short-term investments (stocks, treasury bills, government bonds, private sector bonds, repo and other short-term investments). On the other hand,

[8] There is only one firm with five and four firms with six data points. The rest of the firms have at least 10 consecutive time series.

net fixed assets include all the existing capital stock net of land and depreciation. A detailed discussion of the variables is presented in the appendix.[9]

4.3. Measurement of macroeconomic uncertainty and risk

Regarding uncertainty and risk measures, there is no consensus in the literature over the measurement of uncertainty and sample variation. While the former is caused by unpredictable innovations to the variable of interest, the latter includes predictable innovations from past behavior as well. Bell and Campa (1997), for example measured volatility and uncertainty by the standard deviations of the rates of change, while Serven (1998) used both a standard deviations and GARCH based uncertainty measures. Therefore, we included both sample variation and uncertainty as our control variables and calculated them for manufacturing inflation, which is used as a proxy for overall macroeconomic risk, and for real exchange rate that is more directly related with the profitability risk of investment. The variables are measured by: i) bi-annual average standard deviations of the monthly variables analyzed, ii) bi-annual average standard deviations of monthly innovations to a forecasting equation based on an AR (1) process, and iii) bi-annual average monthly variance from a GARCH (1,1) process based on the equation below:

$$x_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{11} \lambda_i d_t + \alpha_2 x_{t-1} + \varepsilon_t$$
$$h_t^{\,2} = \beta_0 + \beta_1 h_{t-1}^2 + \beta_2 \varepsilon_{t-1}^2 \qquad (8)$$

where X is the variable of interest (i.e. real exchange rate, or manufacturing inflation), t is time trend, d is a monthly dummy variable, h_t^2 is the conditional variance of ε_t and is our uncertainty measure. In the estimation results we reported only those from the GARCH estimation method given that it is closer to the true meaning of uncertainty. However, the results with other measures were not significantly different from those reported.

Furthermore, for robustness test we also employed an overall country risk variable to control for the cost of risk premium and overall riskiness of investing in a particular country. Thus, as the

[9] Bond and Devereux (1990) discuss several points researchers need to be aware of when using firm balance sheet data for economic analysis.

country risk measure, Political Risk Services' International Country Risk Guide Composite Risk Index (ICRG) is adopted. ICRG is a weighted composite index of political and economic risk published by Political Risk Services monthly since 1984 and range between 0 and 100, with 100 representing the least risky country (thus an increase represents declining risk). Due to space limitations only the results from ICRG are reported but those by other risk measures were not significantly different.

4.4. Descriptive statistics and general trends

<Figure 1 Here>

Figure 1 shows the median rate of return gap (*Rgap*) and the share of financial assets in aggregate capital (I^f/K^a) ratios among Argentine, Mexican and Turkish firms in the dataset. Accordingly, the *Rgap* was negative among Mexican firms up until 1994 crisis that overlaps with other papers showing declining profitability in the tradable goods sectors (partly due to overvalued peso). Overall, the median of *Rgap* is found to be positive (8%) among Mexican firms as opposed to the -3%, and -2% in Argentina and Turkey respectively and may help explain the comparatively lower share of financial assets (I^f/K^a) among Mexican firms. Given that real interest rates and the net arbitrage gap (based on uncovered interest parity) as well as the share of public deficits were much lower in Mexico vis-à-vis Argentina and Turkey, the rate of return gap in favor of fixed assets is probably of no coincidence. As discussed in section 2.1, the real interest rates in Argentina and Turkey were 6.2 and 9.4% on average as opposed to 4.2% in Mexico during 1991-2005.[10] Similarly, the sample data shows that the share of financial profits was never higher than 6% on average among Mexican firms for the period analyzed suggesting structural differences with Argentina and Turkey. Among the three, financial investments and profits in the overall capital structure of the firm is the highest among Turkish firms. Accordingly, the median share of financial assets in aggregate capital (i.e. I^f/K^a) has been around 15% in Turkey, twice higher than that of Argentina and Mexico. Such differences also confirm the need for approaching these three countries case by case for testing the presence of financialization. We can also see that despite a decline in the share of financial

[10] The consolidated budget balance, on the other hand, was a positive 1% in Mexico as opposed to negative 1% and 8% in Argentina and Turkey between 1991 and 2002.

investments in the second half of 1990s, it remains very high in the Turkish case, which is above 10% as of 2003. We also observe sudden jumps in the I^f/K^a ratio following financial distress in these markets (i.e. 1994-95, 1997-8, and 2001). In terms of the average share of profits from financial investments, their peaks in Argentina and Turkey were realized during 2001 that is the date of the most serious financial crisis in their recent history when overnight interest rates jumped up to three digit levels. Accordingly, financial profits to fixed assets ratio has reached 40% and 30% in Argentina and Turkey in 2001.

According to Figure 2, we also see a steady decline in the operating profitability rates (defined by operating profits to net sales ratio) of Argentine firms especially starting from mid 90s from around 6 to less than 3% in 2001, and of Mexican firms from 13% to around 8% in 2003 respectively (Figure 2). We see a similar trend in Turkey where the profitability margin dropped from around 20% in 1993 to less that 4 % in 2003. The median for the whole period is found to be 5% in Argentina and 11% in Mexico and 14% in Turkey. The declining operating profit margins are likely to result from increased market competition resulting from entry of new firms and elimination of barriers of entry of foreign firms, and import competition.[11] We also analyzed the changes in the volatility of operating profits using the coefficient of variation of *t -/+2* moving standard deviation of operating profits at constant prices. Accordingly, the coefficient of variation steadily fell in Argentina and Turkey till 1996-1997 and then started to increase back to its early 1990s levels. In contrast, it increased radically in Mexico till 1994-1995 peso crisis and since then displayed a steady decline and is the lowest among the three with an overall average of 0.31 as opposed to 0.48 in Argentina and Turkey. The differences in operating profits volatility between Mexico, and Argentina and Turkey also hint some structural differences among them in terms of the macroeconomic environment firms operate in.

Figure 2 Here>

Finally, while the correlation coefficient between net profits to net sales ratio, and the operating profits to net sales ratio is 0.56 for Mexico and 0.48 in Turkey, it is 0.30 for Argentina that

[11] Likewise, using the same method the operating profit margin in the US was estimated to have fallen from an average of 15% during the 1970s to around 5% during the 90s (Comin and Philippon, 2005).

suggests the importance of non-operational activities and financial costs in the overall profitability of the firm. Another interesting result is that the gap between operating profit and net profit is the largest during times of crisis such as those in 1994 and 2001 in Turkey (where they actually go in opposite directions), 1994:1 and 1997-1999 in Mexico, and 1995:2 in Argentina.

4.5. 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 between the lagged dependent variable and firm specific effects and the error term, we used the Generalized Method of Moments (GMM) estimator by Arellano and Bond (1991)'s first differencing transformation as in (9).[12] 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}:

$$\Delta y_{it} = \alpha \Delta y_{it-1} + \beta' \Delta x_{it} + \Delta v_{it} \qquad (9)$$

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[13] 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. Instead, we used $2 \leq t \leq 3$ lagged values of right hand side variables and time dummies at levels as instruments. 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

[12] In the GMM estimation, the White period based on Arellano and Bond (1991) 2-step method is used for weighting matrices, which enables us to correct for the finite sample bias in the standard errors by using the two-step covariance matrix.
[13] On this issue, see e.g. Greene (1997, p.641).

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 given 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 (first-order correlation is expected in the first differences).

5. Empirical results

The regression analysis from Table 1 provides strong support to our key hypothesis of interest regarding the portfolio allocation choice of real sector firms. Accordingly, looking at the effects of the difference between rates of returns on fixed and financial assets (*Rgap*), we have found a significantly positive relationship (at 1% level) between the *Rgap* and fixed investment spending in all three countries suggesting that increasing rates of return gap between financial and fixed investments reduce new fixed investment spending of private industrial firms. The finding is robust to different control variables as shown in columns (1)-(5) in Table 1 and yield quite similar coefficients on the *Rgap* variable under different specifications. Economically speaking, the results indicate that if the rate of return gaps in Argentina and Turkey have increased from their current median values of -3% and -2% to the Mexican level of 8%, the net fixed investment spending in both countries would increase by 1.1 and 0.5%, which are economically significant changes.

<Table 1 Here>

The results from Table 1 also highlight the negative effects of uncertainty and risk on new fixed investment decisions under multiple investment options. Accordingly, as suggested by equation (3') we have found a significantly (at 1% level) negative effect of real exchange rate and inflation uncertainty on private fixed investment spending in all three countries. Increasing country risk is also found to have a both statistically (at 1% level) and economically significant negative effect on fixed investment in all three cases (a 10% decrease in country risk increases fixed investment spending by 8, 14 and 2% respectively). The results are robust to different (unreported) risk and uncertainty specifications.

Regarding other variables of interest, capital/output ratio (*KO*) is found with the expected negative sign at a statistically significant level in all three countries. Furthermore, we also found a significantly positive (at 1% level) effect of domestic credit availability (*Cr*) on fixed investment spending of real sector firms in all three cases (a 10% increase in credit growth increases fixed investment by 9.9 percent in Argentina, while a 10% increase in the level of credit increases fixed investment rates by 11 and 0.5% in Mexico and Turkey). Lastly, economic growth (GDP) is found to have an economically and statistically significant positive effect on new fixed investment spending in all three countries (i.e. according to point estimates, a 10% increase in real GDP growth increases fixed investment spending by 9, 23. and 6% respectively).

Turning to Hypothesis 2, the results from Table 2, consistent with equation (7) and Table 1, clearly suggest a significantly negative relationship (at 1% level) between the rate of return gap (*Rgap*) and the share of financial assets in total assets in all three countries. Furthermore, the rate of return gap appeared to have five to ten times stronger economic effect on financial investments than on fixed investments in all three cases. This result may stem from the structural differences between the nature of fixed and financial investments where the former suffers from delivery lags, adjustments costs and the irreversibility problem while the latter faces none of such constraints. Therefore, a short-term change in rates of return gap can be expected to have a stronger impact on the financial investments than on fixed investments. In terms of its economic significance, if the median *Rgap* in Argentina and Turkey increased from their current levels of -3% and -2% to the Mexican level of 8%, the share of financial investments would fall by around 5% in both countries.

<Table 2 Here>

On the other hand, regarding the effects of uncertainty and country risk we have found heterogonous results among these countries that highlight diversity in investor behavior. Accordingly, in both Argentina and Turkey *decreasing* exchange rate and inflation risk as well as country risk have been found to increase financial investment shares. One possible explanation for this finding may be related with the effect of decreasing macroeconomic and country risk on financial market returns in

these markets where improvements in overall uncertainty and country risk is accompanied by stock market booms and increasing returns in the financial markets. In the case of Mexico, however, we found a positive relationship between macroeconomic and country risk variables on the one hand and financial investments on the other as predicted by equation (7). This result, although being beyond the scope of the current study, calls for further research on the differences among these three markets (and possibly others) in terms of investor reaction to risk and uncertainty in the case of financial investments.

5.1. Sensitivity analysis

In order to test for the robustness of the empirical results, we undertook three sensitivity tests: i) we first examined the residuals from each of the estimated equations and dropped those observations with residuals that exceed two standard deviations from zero and re-estimated each accordingly. Neither the sign or magnitude nor significance of the coefficients showed any significant change, ii) we replicated the regression estimations using alternative uncertainty variables as discussed in section 3.4 as well as an alternative country risk variable that is Institutional Investor Composite Country Risk Index. The results were similar to those reported, and iii) we included additional control variables borrowed from the determinants of investment literature including cash flow variables, relative cost of capital goods, and net sales growth to test for the robustness of *Rgap* coefficient. The results were similar to those reported.

6. Conclusion

The empirical findings in this study suggest that real sector firms in developing countries take into account alternative investment opportunities in the financial markets when making their decision on physical investment. Accordingly, rather than investing on risky and irreversible long term fixed investment projects, the firms may choose to invest on reversible short term financial investments depending on respective rates of returns, and overall uncertainty and riskiness in the economy. Accordingly, increasing rates of returns gap between financial and real sector investments, increasing risk and uncertainty combined with credit bottlenecks, and profitability squeeze (as reflected by

decreasing operating profitability), real sector firms choose not to invest in fixed assets. This finding also provide some empirical support to the view that successful development strategies require mechanisms to "both encourage and discipline private investors by raising profits above those generated by *competitive market forces*, and active policies to ensure those profits found *outlets* that would add to productive capacity, create jobs and help technological progress" (Unctad, 2003:64, emphasis is mine). The results also suggest certain differences across emerging markets regarding the determinants of fixed and financial investment decisions of real sector firms as well as the presence of financialization depending on the overall macro and microeconomic environment they face.

Overall, the experience of Argentina, Mexico and Turkey suggests that the policy makers in all three countries may need to consider a new strategy to link short-term distortions or disequilibria with the medium and long-term domestic development objectives with special concern regarding determinants of productive investment. Thus, in order to increase fixed investment rates we suggest that there is a need to reorganize the financial system in such a way that domestic (and foreign) savings are directed towards productive investments instead of financial ones. For this objective, our policy recommendations include: a) providing macro and microeconomic stability; b) reducing real interest rates; c) opening up long-term credit channels for fixed investment; and d) eliminating public finance problems.

For further research, we need to repeat the analysis with other developing and developed countries to determine whether the findings are limited only to these three countries and whether there are any differences between developed and developing countries with respect to the portfolio approach to investment.

Appendix

1. Measurement and Generally accepted accounting principles (GAAP)

1.1. Measurement under Argentine GAAP

Until August 31, 1995, and after December 31, 2001 Argentine GAAP required the firms to apply inflation accounting on their financial statements based on consumer price index. Therefore, in calculating biannual values, consumer price inflation period averages are used for all the values in the income statement. When calculating real prices, we adopted Producer Price Index based on period averages as well as end of period values. The former is used for calculating sales, operational profits, net profits before taxes and financial profits in constant prices. The later is used for calculating net fixed assets and financial assets. Furthermore, as a result of new accounting standards in 2002, the comparison of fixed assets and investments before and after 2002 became impossible which is why our dataset stops in 2001:2.

1.2. Measurement under Mexican GAAP

Since 1984, Mexican GAAP requires the firms to apply inflation accounting in their balance sheets and income statements to correct for the effects of inflation. As a result of the price-level inflation accounting system, in calculating biannual values Consumer Price Index period averages is used for measuring all the values in the income statement. When calculating real prices, Producer Price Index is used based on period averages as well as end of period values. The former is used for calculating sales, operational profits, net profits before taxes and financial profits in constant prices. The later is used for calculating net fixed assets and financial assets.

1.3. Measurement under Turkish GAAP

In calculating the variables in constant prices, manufacturing price index period averages are used for all variables given that inflation accounting was not used during the period covered. In calculating real prices, for financial and fixed assets end of period prices, while for sales, operational profits, and financial profits period averages are used.

2. Data definitions and sources

2.1. Common variables

Cr_t: Total credit to the private sector as a share of GDP (for Argentina it is the growth rate of total real credit to the private sector).

π^f_t: Financial profits and includes dividend income from subsidiaries and affiliates plus interest income and other dividends, plus other income from other operations including gains from foreign exchange transactions net of losses and expenses from other operations.

$(I^f / K^a)_t$: Total financial assets to aggregate capital ratio measured as $(I^f / I^f + K)_t$ using period averages for both numerator and denominator.

I^f_t: Total financial assets including current assets (cash, bank deposits, other current assets, cheques) and short-term investments (stocks, t-bills, government bonds, private sector bonds, REPO and other short term investments). The sum reflects total marketable and liquid monetary assets held by the firm.

$ICRG_t$: ICRG scores can be interpreted as probabilities, which then allows a logistic transformation on the credit rating that is equal to ln((ICRG/100)/(1-(ICRG/100))).

KO_t: Capital-output ratio measured as beginning fixed capital stock/net sales at constant prices.

K_t: Net fixed assets measured as end of period fixed capital stock net of depreciation and land.

r^f_t: Rate of return on financial assets $(\pi^f / I^f)_t$ using period averages.

RGDP: Real GDP growth measured as annualized log differences.

r^k_t : 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).

Real interest rate: Monthly averages of 3-month Treasury bill rate deflated by next period consumer price inflation.

$RSCF_t$: Real short-term capital inflows defined as Portfolio investment liabilities (equity plus debt securities) plus Other investment Banks liabilities plus Other investment Other sector Liabilities.

2.2. Country specific variables

2.2.1. Argentina

All macro values are at fixed 1995 prices by Producer Price Index (PPI). The macro data are from International Financial Statistics of IMF (IFS), and Central Bank of Argentina.

I^f_t: Includes cash and short-term investment accounts. Long-term financial investments in other firms are not included given that this variable is reported as a total including the investment in subsidiaries. Because of certain inconsistencies in the reporting of the data and in the classification of different cash items the measurement of I^f_t is underestimated (the details are available from the author upon request).

K_t: Fixed capital stock including net property, plant and equipment.

π^f_t: Under Argentine GAAP there are several problems with the listing of different financial income/expenditure accounts according to the above classification in Argentina. To avoid certain accounting problems and inconsistencies in reporting, four different financial profits variables are calculated: a) Interest revenue, b) Interest revenue plus net foreign exchange revenue plus other revenues from financial assets, c) interest revenue plus net foreign exchange revenue, d) interest revenue plus other financial revenues from assets. The same methodology is adopted for calculating the rate of return on financial assets. In the final specification, (a) is used as the financial profits measure due to more robust measurement. As a result, the financial profits measure is underestimated compared to Mexico and Turkey.

RER: Natural log of real exchange rate index based on US and Argentine producer prices where January 1995=100.

RiskInf: Annualized average PPI inflation (calculated as log differences) volatility using Garch (1, 1) method and is calculated for 1991:1-2001:12.

RiskRer: RER volatility using Garch (1, 1) method and is calculated for 1991:1-2001:12.

2.2.2. Mexico

All macro variables are converted to fixed prices using Producer Price Index (INPP) at 2003 December prices. The macro data are from IFS and Banco de Mexico.

I^f_t: Includes cash, short-term investments, and investment in other companies. The investments in other companies (not affiliates) are restated for inflation and recorded at current prices.

K_t: Net fixed assets including property, plant and equipment net of depreciation together with land given that it is not disclosed separately.

π^f_t: Includes net foreign exchange losses (gains), financial income (loss), and income (loss) 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.

RER_t: Natural log of real exchange rate index (1990=100) calculated with respect to 111 countries.

$RiskInf_t$: Annualized average INPP inflation (calculated as log difference with respect to previous period) volatility using Garch (1, 1) method and is for 1981:1-2003:12.

$RiskRer_t$: RER volatility using Garch (1, 1) method and is calculated for 1981:1-2003:12.

2.2.3. Turkey

All firm related data are converted to fixed prices using Manufacturing Whole Sale Price Index (MWPI) at 1995 January prices. The remaining data are by general Wholesale Price Index (WPI) at 1995 January prices. The data are from IFS and Central Bank of Turkey.

I^f_t: Includes current assets and 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.

K_t: Net fixed assets including fixed capital stock net of depreciation excluding land.

π^f_t: 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.

RER_t: Natural log of real exchange rate index where January 1987 =100. It is calculated based on the weights of US dollar, German Mark, and Euro.

$RiskRer_t$: RER volatility using Garch (1, 1) method and is for 1978:1-2003:12.

$RiskInf_t$: Annualized average manufacturing wholesale price inflation (calculated as log differences) volatility using Garch (1, 1) method and is calculated for 1978:1-2003:12.

3. Descriptive statistics

<Table 4 & 5 Here>

References

Abel, A. B., Blanchard, O. J., 1986. Investment and sales: some empirical evidence. NBER Working Paper No: 2050, National Bureau of Economic Research.

Aiginger, K., 1987. Production Decisions under Uncertainty. Oxford: Basil Blackwell.

Aizenman, J., Marion, N., 1999. Volatility and investment: interpreting evidence from developing countries. Economica 66, 157-179.

Arellano, M., Bond, S. R., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies 58, 277-297.

Bank for International Settlements (BIS), 2005. Triennial Central Bank Survey. Basel: BIS.

Bell, G. K., Campa, J. M., 1997. Irreversible investments and volatile Markets: a study of the chemical processing industry. Review of Economics and Statistics 79, 79-87.

Blanchard, O., Rhee, C., Summers, L., 1993. The stock market, profit and investment. The Quarterly Journal of Economics 108, 115-136.

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

Bond, S., Dewereux, M., 1990. Economic analysis of company accounts. Investigaciones Economicas 14, 47-62.

Bond, S., Meghir, C., 1994. Dynamic investment models and the firm's financial policy. Review of Economic Studies 61, 197-222.

Comin, D., Mulani, S., 2006. Diverging trends in aggregate and firm volatility. The Review of Economics and Statistics 88, 374-383.

Comin, D., Philippon, T., 2005. The rise in firm-level volatility: causes and consequences. NBER Working Paper No. 11388**,** NBER.

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: Epstein, G. (ed.). Financialization and the World Economy. Edward Elgar, pp. 77-110.

Demir, F., 2004. A failure story: politics and financial liberalization in Turkey, revisiting the revolving door hypothesis. World Development 32 (5), 851-869.

Driver, C., Moreton, D., 1991. The influence of uncertainty on UK manufacturing investment. Economic Journal 101, 1452-1459.

Dumenil, G., Levy, D., 2005. Costs and benefits of neoliberalism: a class analysis. In Epstein, G. (Ed.), Financialization and the World Economy. Edward Elgar, pp. 17-45.

Economist Intelligence Unit (EIU), 2003a. Country Finance, Mexico. Economist Intelligence Unit.

Economist Intelligence Unit, 2003b. Country Finance, Turkey. Economist Intelligence Unit.

Epstein, G A., Jayadev, A., 2005. The rise of rentier incomes in OECD countries: financialization, central bank policy and labor solidarity. In: Epstein, G. (Ed.), Financialization and the World Economy. Edward Elgar. pp. 46-74.

Edwards, S., 1989. Real exchange rate in the developing countries: concepts and measurement. NBER Working Paper No. 2950, NBER.

Fanelli, J. M., Rozenwurcel, G., Simpson, L. M., 1998. Financial reform in developing countries: Argentina. In: Fanelli, J.M., Medhora, R. (eds.). Financial Reform in Developing Countries. St. Martin's Press, New York, pp. 31-56.

Federer, J., 1993. The impact of uncertainty on aggregate investment spending. Journal of Money, Credit and Banking 25, 30-48.

Frenkel, R., Ros, J., 2006. Unemployment and the real exchange rate in Latin America. World Development 34(4), 631-646.

Gabriele, A., Boratav, K., Parikh, A., 2000. Instability and volatility of capital flows to developing countries. The World Economy 23, 1031-1056.

Goldberg, L., Dages, B. G., Kinney, D., 2000. Foreign and domestic bank participation in emerging markets: lessons from Mexico and Argentina. NBER Working Paper No. 7714, NBER.

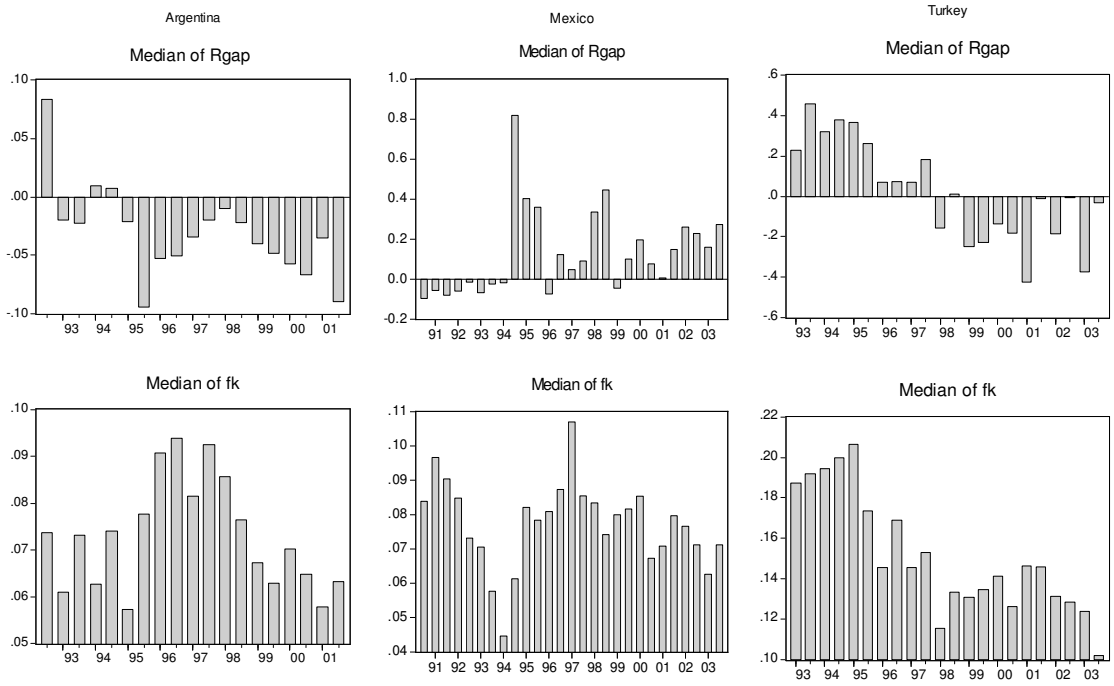
Grabel, I., 1995. Assessing the impact of financial liberalisation on stock market volatility in selected developing countries. The Journal of Development Studies 31(6), 903-917.

Grier, R., Grier, K.B., 2006. On the real effects of inflation and inflation uncertainty in Mexico. Journal of Development Economics 80, 478-500.

Guncavdi, O., Bleaney, M., McKay, A., 1998. Financial liberalization and private investment: evidence from Turkey. Journal of Development Economics 57, 443-455.

Hausmann, R., Gavin, M., 1995. Overcoming volatility. Special Report, Economic and Social Progress in Latin America. Washington D.C.: Inter-American Development Bank.
Huang, C., Litzenberger, R.H., 1988. Foundations for Financial Economics. Netherlands: North-Holland.
ISO (Istanbul Chamber of Industry), Top 500 Manufacturing Firms Survey, Various Years.
Kose, A., Prasad, E., Terrones, M., 2003. Financial integration and macroeconomic volatility, IMF Staff Paper 03/50. IMF, Washington, D.C.
Le, Q. V., Zak, P. J., 2006. Political risk and capital flight Journal of International Money and Finance 25, 308-329
Lustig, N. C., Ros, J., 1999. Economic reforms, stabilization policies, and the Mexican disease. In: Taylor, L. (Ed.), After Neoliberalism What Next for Latin America. The University of Michigan Press, Ann Arbor, pp.17-52.
McKinnon, R. I., 1973. Money and Capital in Economic Development. Brookings Institution, Washington DC.
Montiel, P., Serven, L., 2004. Macroeconomic stability in developing countries: How much is enough? World Bank Policy Research Working Paper 3456. World Bank.
Peek, J., Rosengren, E. S., 2000. Implications of the globalization of the banking sector. Federal Reserve Bank of Boston New England Economic Review. September/October, 45-62.
Pindyck, R., Solimano, A., 1993. Economic instability and aggregate investment. In :Blanchard, O. J., Fischer, S. (eds.), NBER Macroeconomics Annual. MIT Press, Cambridge, pp. 259-302.
Price, S., 1996. Aggregate uncertainty, investment and asymmetric adjustment in the UK manufacturing sector. Applied Economics 28, 1369-79.
Rama, M., 1993. Empirical investment equations for developing countries. In: Serven, L., Solimano, A. (eds.), Striving for Growth after Adjustment, The Role of Capital Formation. The World Bank, Washington D.C., pp.107-146.
Ramey, G., Ramey, V.A., 1995. Cross country evidence on the link between volatility and growth. American Economic Review 85(5), 1138-1151.
Rojas-Suarez, L., Weisbrod, S., 1996. Building stability in Latin American financial markets. Working Paper no.320, Inter-American Development Bank, Washington, D.C.
Serven, L., 1998. Macroeconomic uncertainty and private investment in Less Developed Countries: an empirical investigation. Mimeo, The World Bank.
SPK (Capital Markets Board of Turkey), 2004. Trading Volume in Secondary Markets. Monthly Bulletin, December, SPK, Ankara.
Shaw, E. S., 1973. Financial Deepening in Economic Development. Oxford University Press, New York.
Stockhammer, E., 2004. Financialization and the slowdown of accumulation. Cambridge Journal of Economics 28(5), 719-741.
TBB (The Banks Association of Turkey) Periodical Statistical Reports. Istanbul.
Tobin, J., 1965. Money and economic growth. Econometrica 33(4), 671-84.
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), 2003. Trade and Development Report: Capital Accumulation, Growth and Structural Change, United Nations, Geneva and New York.
Van Der Hoeven, R., Taylor, L., 2000. Introduction: structural adjustment, labor markets and employment: some considerations for sensible people. Journal of Development Studies 36, 57-65.
Wei, S., Zhang, C., 2006. Why did individual stocks become more volatile? Journal of Business 79, 259-292.
World Bank, 2007. World Development Indicators Electronic Database. World Bank.

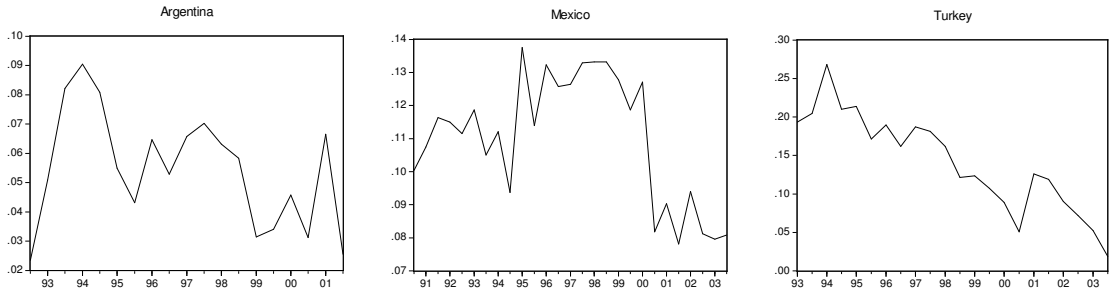
Graph 1: Median Rate of return gap (*Rgap*) and Financial assets to aggregate capital ratio (*fk*)



Source: Author's calculations.

Notes: *Rgap* is the difference between rate of return on fixed (r^k) and financial assets ($r^{f.}$).

Graph 2: Median operating profitability margins



Source: Author's calculations.

Notes: Operating profitability margin is defined as operating profits to net sales ratios.

Table 1: Dependent variable I^k_{it}

	Argentina					Mexico					Turkey				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
I^k_{-1}	-0.277***	-0.267***	-0.32***	-0.303***	-0.28***	-0.206***	-0.203***	-0.283***	-0.303*	-0.14***	-0.252***	-0.256***	-0.225***	-0.26***	-0.28***
	(0.004)	(0.006)	(0.007)	(0.004)	(0.008)	(0.002)	(0.004)	(0.026)	(0.03)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
KO_{-1}	-0.184***	-0.17***	-0.165***	-0.18***	-0.195***	-0.12***	-0.12***	-0.192***	-0.21*	-0.132***	-0.24***	-0.24***	-0.204***	-0.22***	-0.22***
	(0.004)	(0.004)	(0.004)	(0.002)	(0.001)	(0.002)	(0.002)	(0.017)	(0.014)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
$Rgap_{-1}$	0.014***	0.022***	0.025***	0.02***	0.02***	0.003***	0.003***	0.002***	0.003*	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.001)	(0.0001)	(0.001)	(0.0001)	(0.001)	0.0001)	(0.0002)	(0.001)	(0.001)	(0.0001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
RiskRer	-1304***					-16.41***					-7.31***				
	(21.9)					(0.082)					(0.46)				
RiskInf		-24.23***					-0.48								
		(0.64)					(0.003)								
$RiskInf_{-1}$												-0.0003			
												(0.001)			
ICRG			0.83***					1.44***					0.18***		
			(0.004)					(0.184)					(0.002)		
Cr				0.99***					4.93***					0.552***	
				(0.02)					(0.397)					(0.01)	
GDP					0.92***					2.296***					
					(0.02)					(0.01)					
GDP_{-1}															0.634***
															(0.005)
Obs	726					1479					2830				
Sargan	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1	1.00	0.99	0.99	0.99	0.99	0.99
m1	0.03	0.04	0.06	0.06	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
m2	0.36	0.42	0.16	0.23	0.67	0.91	0.85	0.35	0.58	0.62	0.19	0.27	0.18	0.48	0.68

Notes: Arellano-Bond dynamic panel-data estimation, two-step GMM results with robust standard errors in parenthesis. All regressions initially included a set of industry dummies which are dropped in the final specification because of lack of significance. The coefficients for the year fixed effects are not reported. (***), (**), (*) refer to significance at 1, 5 and 10% level respectively. (-1) refers to lag-1. I^k_{it} is the net fixed investment spending of firm *i* at time *t*. *KO* is capital-output ratio in natural log, *Rgap* is rate of return gap (r^k - r^f), *RiskRer* and *RiskInf* are real exchange and inflation uncertainty measured by GARCH (1,1) method, *ICRG* is International country risk guide composite risk index in natural log transformed as described in the data appendix. *Cr* is credit to private sector as a share of GDP (except for Argentina where it is measured as the real credit to private sector growth). *GDP* is real GDP growth rate measured by log differences. Obs is number of observations. Sargan is the test of over-identifying restrictions, m1 and m2 are standard AR(1) and AR(2) tests. All test statistics are given by their p-values.

Table 2: Dependent variable $\log(I^f/K^a)_{it}$

	Argentina			Mexico			Turkey		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
FK_{-1}	0.727***	0.707***	0.703***	0.93***	0.943***	0.941***	0.89***	0.88***	0.89***
	(0.01)	(0.01)	(0.007)	(0.01)	(0.012)	(0.017)	(0.003)	(0.004)	(0.003)
FK_{-2}	-0.255***	-0.248***	-0.257***	-0.445***	-0.444***	-0.449***	-0.33***	-0.325***	-0.326***
	(0.012)	(0.003)	(0.008)	(0.014)	(0.012)	(0.013)	(0.002)	(0.002)	(0.002)
K^a	-0.1	-0.11***	-0.136***	0.003	0.013	0.046**	0.12**	0.235***	0.219***
	(0.066)	(0.047)	(0.032)	(0.025)	(0.02)	(0.019)	(0.008)	(0.013)	(0.013)
$Rgap_{-1}$	-0.078***	-0.075***	-0.078***	-0.027***	-0.027***	-0.027***	-0.01***	-0.01***	-0.01***
	(0.008)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.0001)	(0.0002)	(0.0002)
RiskRer	-1535.2***			1.653***			-0.048***		
	(189)			(0.455)			(0.291)		
RiskInf		-12.27***			0.049***			-0.365**	
		(1.386)			(0.011)			(0.012)	
ICRG			0.315***			-0.072			0.25***
			(0.02)			(0.024)			(0.011)
Obs	733			1294			2532		
Sargan	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
m1	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
m2	0.48	0.39	0.45	0.48	0.44	0.50	0.51	0.52	0.52

Notes: (-1) and (-2) refer to the first and second lags. *FK* is the financial assets to aggregate capital ratio of firm *i* at time *t* in natural log (i.e. $ln(I^f/K^a)_{it}$), K^a is the aggregate capital in natural log as in Equation (7), for other variables refer to Table 1. All regressions initially included a set of industry dummies that are dropped for lack of significance. The Final specification for Mexico and Turkey include unreported lags of dependent variable in the order of four and three. For sensitivity analysis we also tested the results using fixed effects method as well as without the lagged endogenous variable on the right hand side. The coefficients were similar to those reported.

Table 4: Correlation matrix

Argentina	I^k	I^f/K^a	*Rgap*	*RiskRer*	*RiskRer*	*ICRGP*	*KO*
I^k	1						
I^f/K^a	0.068	1					
Rgap	0.087	0.169	1				
RiskRer	-0.135	-0.012	0.014	1			
RiskInf	-0.099	-0.010	-0.072	-0.183	1		
ICRG	0.172	0.004	0.071	-0.162	-0.037	1	
KO	-0.141	-0.296	-0.115	0.005	-0.005	-0.0002	1
Mexico	I^k	I^f/K^a	*Rgap*	*RiskRer*	*RiskRer*	*ICRGP*	*KO*
I^k	1						
I^f/K^a	-0.009	1					
Rgap	-0.070	-0.076	1				
RiskRer	-0.336	-0.003	0.076	1			
RiskInf	-0.344	-0.004	0.073	0.997	1		
ICRG	0.186	-0.001	-0.040	-0.387	-0.403	1	
KO	-0.206	-0.273	0.101	0.093	0.099	0.024	1
Turkey	I^k	I^f/K^a	*Rgap*	*RiskRer*	*RiskRer*	*ICRGP*	*KO*
I^k	1						
I^f/K^a	0.017	1					
Rgap	0.054	0.170	1				
RiskRer	-0.116	-0.008	-0.038	1			
RiskInf	0.113	-0.039	-0.037	-0.543	1		
ICRG	0.125	0.054	0.073	0.116	-0.370	1	
KO	-0.128	-0.313	-0.116	0.049	0.045	-0.111	1

Table 5: Summary statistics

Argentina	I^k	I^f/K^a	*Rgap*	*RiskRer*	*RiskInf*	*ICRG*	*KO*
Mean	-0.030	0.164	-0.16	0.00005	0.035	0.914	2.374
Median	-0.007	0.073	-0.032	0.00004	0.036	0.920	1.594
Maximum	2.120	0.942	7.647	0.00013	0.036	1.144	30.810
Minimum	-3.961	0.0002	-12.124	0.00004	0.033	0.619	0.003
Std. Dev.	0.312	0.203	1.016	0.00002	0.001	0.145	2.710
Mexico	I^k	I^f/K^a	*Rgap*	*RiskRer*	*RiskInf*	*ICRG*	*KO*
Mean	0.012	0.143	0.349	0.002	0.058	0.863	1.963
Median	-0.001	0.080	0.08	0.001	0.013	0.867	1.568
Maximum	2.150	0.921	22.443	0.031	1.065	1.040	16.561
Minimum	-1.289	0.001	-10.948	0.001	0.002	0.645	0.032
Std. Dev.	0.238	0.174	1.785	0.006	0.198	0.102	1.602
Turkey	I^k	I^f/K^a	*Rgap*	*RiskRer*	*RiskRer*	*ICRG*	*KO*
Mean	0.013	0.217	-0.959	0.002	5.768	0.324	0.614
Median	-0.001	0.148	-0.018	0.001	5.871	0.301	0.423
Maximum	2.176	0.948	53.525	0.012	5.877	0.682	8.545
Minimum	-2.554	0.0002	-92.167	0.0002	4.357	-0.050	0.005
Std. Dev.	0.255	0.203	6.737	0.003	0.342	0.197	0.674

Notes: For variable definitions refer to Notes of Table 1 and 2. Unlike in regression estimations, all variables are at levels without natural logs.