

IMF Working Paper

Causes of Asset Shortages in Emerging Markets

Jiaqian Chen and Patrick Imam

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Monetary and Capital Markets

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Abstract

This Working Paper should not be reported as representing the views of the IMF.

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We first illustrate that emerging markets (EMs) face a shortage of financial assets, with financial assets not growing as rapidly as domestic savings. We then estimate the asset shortage in EMs for 1995–2008. We develop a model that explains how asset shortage develop, and then econometrically estimate the causes of asset shortages. We conclude with policy implications.

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I. INTRODUCTION

Capital markets in emerging markets (EMs) have expanded rapidly in recent years, with demand for assets expected to grow strongly for the foreseeable future. Following the 1980s crisis in Latin America and the 1990s crisis in East Asia, most EMs undertook bold reforms, encompassing fiscal orthodoxy, predictable monetary policies, and other structural reforms that led to a strengthening of the balance sheets of both the public and private sectors. The ensuing macroeconomic stability was not materially affected by the 2008 global credit crisis, with macroeconomic stability remaining intact and balance sheets still robust. Rising domestic savings—in the form of increasingly capitalized pension and mutual funds and reduced financing needs of public entities—and the increasing demand for EM assets from local and foreign investors, insurance companies, and other financial intermediaries, have led to greater appetite for domestic equity, bonds, and other financial assets.

The paradox of the improved macroeconomic environment in EMs is that while savings have remained strong or even increased, the supply of financial assets has not risen commensurately. High equity returns, a stable macroeconomic environment and increasing assets under management by institutional investors have not led to the takeoff of the primary market in most EMs. Equity issuances/Initial Public Offerings (IPOs) are still infrequent, though there are regional variations (Appendix 1). Whereas Asian companies tend to issue domestically, Latin American companies are biased toward raising capital overseas instead. Most domestic fixed income markets are highly underdeveloped and dominated by public debt; outside public short-term debt, most fixed-income products remain illiquid (de la Torre and Schmukler, 2006).

The constraint to expanding domestic assets is partly structural, related to market size. Outside the Brazil, Russia, India, and China (BRICs), most EMs are small economies, which limits the scope for deep domestic financial markets. The selective nature of issuers—mainly companies in the mining sector in Latin America or manufacturing companies in East Asia—restricts the benefit of diversification for investors. Corporate culture, such as the unwillingness to give up control, also plays a part in explaining why entities and controlling shareholders are reluctant to relinquish control over firms.

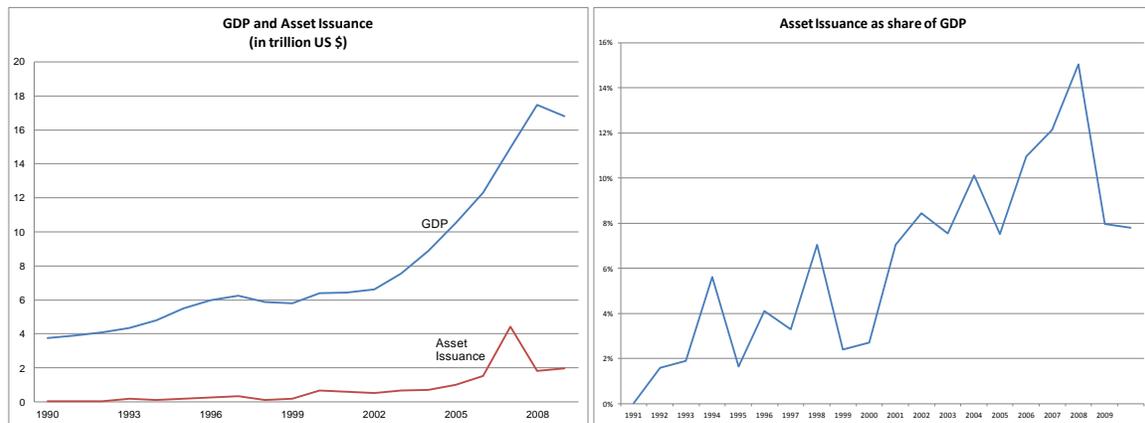
The lack of domestically investible assets, if not addressed, could potentially lead to large macroeconomic imbalances that threaten stability. A shortage of investible assets leads to excess liquidity that lowers interest rates and raises asset prices on equity and housing. Moreover, the dominance of buy and hold investors leads to fewer transactions, which raises the entry and exit costs into the stock market. In any case, share prices are not good indicators of actual market prices in illiquid and underdeveloped markets. They suffer from a shortage of information and high spreads, and are prone to be affected by noise traders and large swings in price volatility. The shortage of domestic financial assets, combined with investment restrictions abroad, could lead to bubbles with too much capital chasing too few assets. Market efficiency is also affected, as in a world of imperfect capital mobility—owing to investment restrictions—misalignments in asset valuation relative to the economic fundamentals can be long lasting.

The paper is structured as follows. In Section II, we describe asset shortages and their symptoms; in Section III, we discuss possible causes of asset shortages. The asset shortage index is modeled in Section IV, and constructed in Section IV, followed in Section VI by an estimation of the factors driving asset shortages. Section VII concludes with policy implications.

II. WHAT ARE ASSET SHORTAGES AND WHAT ARE THE SYMPTOMS?

EMs are producing too few financial assets relative to rising savings levels, leading to asset shortages. This is not a new phenomenon. Other countries have been able to grow rapidly without issuing substantial amounts of financial assets, such as communist countries in the past or oil-producing nations today. Therefore, an economy's ability to produce output is only imperfectly linked to its ability to generate financial assets (Caballero, 2006). As illustrated below (Figure 1), although EM asset issuance, as a share of GDP, has increased since 1990, it is still low relative to GDP, and does not grow one-to-one with GDP.

Figure 1. Asset Issuance in Emerging Markets



Source: WDI and Dealogic.

For asset shortages to exist there must be market imperfections; otherwise interest rates would balance the supply and demand for assets. Either savings are not responsive to interest rates (and there is a lot of empirical evidence suggesting that savings are indeed highly inelastic relative to interest rates) or the supply of assets is not responsive to interest rates alone. Also, capital markets are subject to market inefficiencies—noncompetitive markets lead to high transaction costs, information asymmetry—and these problems are particularly severe in EMs.

Prior to the EM crises of the 1990s, EMs grew rapidly, with high savings rates accompanied by high investment rates. However, while savings rates have remained high, investment rates have started to decline following the Asian crisis, leading to a shortage of financial assets in these countries (Rajan, 2006). The shortage was exacerbated by the rapid growth of savings in China and in commodity producing countries that do not generate financial assets on a sufficient scale to satisfy demand for them (Caballero, 2006).

Fewer investment opportunities in EMs have resulted in asset shortages, with negative implications for both the macroeconomy and financial markets. Investment opportunities have been restrained by the inability to issue financial assets in EMs. Emerging bottlenecks in capital markets, with too much money chasing too few assets, have given rise to some perverse consequences for market efficiency. These include:

- ***Low real interest rates.*** With too much savings chasing too few investments, real interest rates are kept low (by historical standards) (see also GFSR, 2005). Low interest rates are in turn pushing economic agents into higher-risk assets, searching for yields and bringing real interest rates down further.
- ***Illiquid capital markets in EMs.*** The lack of liquidity in many EM capital markets is a result of investors trying to grab any assets they can and holding on to them. The mismatch leads to buy and hold strategies by investors and concentrated ownership, leading to illiquidity in domestic capital markets (and lending itself to market misconduct and price manipulation).
- ***Misalignment in the valuation of assets, leading to bubbles in extreme cases.*** A mismatch between asset supply and demand may lead to sustained misalignments in asset valuation relative to the economic fundamentals. The recurrent speculative bubbles observed in EM economies are a reflection of these misalignments.²
- ***Capital flows from EMs to advanced economies (AEs).*** The Lucas paradox, that capital is flowing from EMs to advanced countries, is again a symptom of asset shortages in EMs. With a limited amount of assets to invest in, savers in EMs invest their savings overseas. Sovereign Wealth Funds (SWFs) are an extreme form of asset shortage, with massive savings in EMs not absorbed by the domestic economy, because of the lack of financial assets.

III. WHAT CAUSES ASSET SHORTAGES?

Asset shortages have become severe in the last two decades in EMs, owing to a combination of (i) the dwindling supply of financial assets; (ii) the increased supply of domestic savings; (iii) regulatory restrictions on what assets institutional investors can purchase; and (iv) other factors. Let us look at them in turn.

²While only anecdotal, the last few decades have seen increases in bubbles, which have become more frequent across more financial assets. Mexican and other Latin American debt suffered from a crash in 1982 and again in 1994; stocks of the Asian Tiger economies came back to earth in 1997; China, and with it commodity prices, peaked in 2007, and prices have fallen since, before recovering more recently. EM stock, currencies, credit, and other commodities once operated in their separate kingdoms and followed their own rules. Now, given asset shortages, they increasingly are interlinked financial assets; and when one market expands with the inflow of money, many risky assets shoot upward simultaneously, forming synchronized bubbles.

A. Dwindling Supply of Financial Assets in EMs

- ***Fiscal improvements.*** Government fiscal policy is a key source of the supply of financial assets. According to the “Original Sin” line of reasoning (Eichengreen and Hausmann, 1999; Hausmann and Panizza, 2010), most EM governments and corporations are unable to borrow in local currency, due to shallow domestic capital markets and the unwillingness of investors to fund large investments in an EM currency, with the side effect of leading to a lack of supply of domestic financial assets. Several EM countries have improved their overall sovereign debt management practices, by increasing the share of domestic-currency denominated debt. Nonetheless, although the issuance of domestic debt has recently increased thereby raising the supply of domestic financial assets, the original sin has declined only marginally and only in a few countries (Hausmann and Panizza, 2010). Given original sin, abstinence of debt has become an important strategy in EMs, with governments running orthodox fiscal policies, thereby supplying few financial assets.
- ***High uncertainty.*** EMs have been subject to severe and repeated shocks in the last two decades, most notably the Asian crisis, which created high risk averseness. Banking systems in Asia and Latin America have been highly regulated since, forced to keep high liquidity buffers and capital ratios, which has created a stable banking system, though also a conservative one often constraining credit growth. In addition, poor property rights, weak contract enforcement, and judicial arbitrariness are just a few problems that by increasing uncertainty, constrain investment and lead to low private rates of return (owing to low appropriability). While most EMs have made great progress in addressing these problems over time, this has not been enough to address asset shortages.³

B. Increased Supply of Domestic Savings

- ***Pension reforms in Latin America, increasing commodity prices in the Middle East and Africa, and rising savings in East Asia have contributed to an increasing supply of savings in EMs.*** While one could have expected rising consumption levels and falling savings with rising income per capita, pension reforms and positive exogenous shocks in the form of rising commodity prices or rising demand for export products have tended to lead to high saving rates.
- ***Underdeveloped capital markets.*** Savings in EMs are motivated in part to fund lumpy physical investments, because underdeveloped capital markets require agents to save on a massive scale and over an extended period of time. As EMs industrialize, and as investment requirements increase substantially, credit-constrained investors require ever

³***Past investment excesses.*** One argument, advanced by Rajan (2006), is that past booms are still working themselves through the system. Following past overinvestment, the investment overhang still needs some time to pass through the system. In other words, past misallocations of investment are still haunting current investment expenditure. Corporations are therefore cautious in their investment strategy to avoid overinvestment. While there is some plausibility to this argument, it is a temporary phenomenon.

larger savings to finance lumpy investments. Investors have to accumulate a large share of the savings before they can ever invest, leading to an increase in domestic savings.

C. Regulatory Restrictions

- **Regulatory restrictions on agents.** A substantial portion of the world's desired savings are put to work by governments, central banks, and financial institutions like insurance companies. Many of these agents are ordered by law to buy fixed-income products, such as domestic government bonds, and are constrained in regard to investments in certain assets classes, including foreign assets (see Box 1).

Box 1. Regulatory Restrictions of Latin American Pension Funds

Chile was the pioneer in pension reform in Latin America, and its model was copied throughout Latin America. In 1981, a comprehensive change took place in the pension system, changing the state-run, defined-benefit scheme to a defined-contribution system managed entirely by the private sector (by pension management companies called "AFPs"), under the supervision of a dedicated government agency, the Superintendency of AFP. Chile introduced mandatory individual savings accounts in the early 1980s; later, Argentina, Bolivia, Colombia, Ecuador, Mexico, Peru, and Uruguay followed suit, borrowing heavily on the Chilean model (Borensztein and others, 2008).

The system's investment opportunities are heavily regulated. The regulator of pension funds in all these Latin American countries sets strict regulations on foreign exposure, ranging from single-digit limits to about one-third of the funds. Both foreign and domestic fixed income investments typically are restricted to high-grade entities, funds for the government, and local blue-chip companies. Exposure to equity is also highly restricted, again only to blue-chip companies. Pension fund investments have given rise to abnormally low corporate bond spreads, well below sovereign spreads. The upward trend in stock prices is attributed partly to the demand exerted by these pension funds. This brings about some perverse consequences for market efficiency: prices may become misaligned from fundamentals; and liquidity is continually drained from the market place.

Restricting investment opportunities for pension funds reduces the investment universe. The limits might have been set on the grounds that (i) pension funds should rejuvenate anemic local financial markets; (ii) emerging markets are financially constrained and hence should not be capital exporters; and (iii) pension fund managers and supervisors are unfamiliar with external investment opportunities, exacerbating portfolio risk and moral hazard. These motives increasingly do not hold sway, and if not reformed, could lead to rising asset shortages. First, the overarching goal of any funded pension system is to maximize old-age retirement wealth at tolerable risk levels. This goal should not be subordinated to other commendable objectives. Local markets are poorly correlated with international markets, thus diversification is likely to pay off in the long term. Second, for crisis prone economies, domestic systemic risk makes it advisable to partially rely on more stable markets, provided efficient risk management policies are in place in every AFP. Finally, it is not necessary for the pension fund manager to deal with foreign asset selection directly, because many reputable international global fund managers with excellent track records can be hired at low cost, as they are in many countries.

Box 1. Regulatory Restrictions of Latin American Pension Funds (continued)

The limit on foreign investment and risky domestic investable securities could be further relaxed from the current levels to reduce asset shortage problem. There is strong evidence internationally that home bias tends to result in strong suboptimality of portfolios. Thus, it is not possible to justify a limit on foreign investment on economic grounds. Ideally, limits should be lax enough to allow AFPs to use less restrictive risk management policies and to eliminate the apparent excess demand for local financial instruments. Public offerings have not shown the expected dynamism and have largely lost their desirable characteristics (efficient pricing and liquidity). Asset-backed securities on mortgages and other receivables, real estate, and infrastructure projects should be given priority.

Regulatory Restrictions on Pension Funds in Latin American Countries (as of April 2010)
(as a percentage of assets under management)

Brazil	
Assets	Maximum limit
Government	100
Corporate Debt ⁽²⁾	80
Equities	50
Real Estate Investment	8
Loans and Financing	15
Offshore Investment	3

⁽²⁾ applies for high quality assets
Source: SPC and J.P. Morgan

Uruguay	
Assets	Maximum limit
Sovereign Debt	60
CB + Hipotecario Bank	30
Onshore Deposits	30
Hedge operations	10
Offshore Fixed Income assets	15

Source: JP Morgan

Colombia	
Assets	Maximum limit
Government Debt (domestic and external)	50
Corporate Bonds	40
Fogafin/ Fogacoop holdings	10
Mortgage Securities	40
Equity/ Soc. Participations	40
Offshore issued assets (EQ+FI)	40
CDs	5

Source: Superfinanciera and J.P. Morgan

Peru	
Pension Funds	Maximum limit
Overall Investment Limits	
Sovereign Debt (A)	30
CB Instruments (B)	30
Sovereign and CB instruments (a+b)	40
Offshore Holdings	30

Maximum Limits by fund	Fund 1	Fund 2	Fund 3
Local and off shore equities	10	45	80
Bonds	100	75	70
Short-term securities and cash	40	30	30
Derivatives	10	10	20

Source: SBS and J.P. Morgan

Chile					
Assets	Fund A	Fund B	Fund C	Fund D	Fund E
Government debt (including cer	60	60	60	60	60
Corporate bonds (private & pub	30	30	10	10	3
Foreign Currency Investments ⁽¹⁾	50	40	35	25	15
Equities	80	60	40	20	5
CDs (offshore) ⁽³⁾	15	15	15	15	15
Mutual funds + Investment Func	40	30	20	10	5
Overnight Deposits	2	2	2	2	2
Onshore Mutual Funds	5	5	5	5	5

⁽²⁾ Net of hedge positions; an overall limit of 30 percent of AUM (unhedged) applies for the entire portfolio

⁽³⁾ The 15 percent limit applies to the onshore portfolio

Source: SAF JP and J.P. Morgan

Mexico					
Assets	Fund 1	Fund 2	Fund 3 and 4	Fund 5	
Equity (domestic and foreign)	0	15	20	25	30
Foreign currency investments	30	30	30	30	30
Government securities	no limit	no limit	no limit	limit	no limit
International fixed income	20	20	20	20	20
Corporate debt	no limit	no limit	no limit	limit	no limit
Financial institutions	no limit	no limit	no limit	limit	no limit
Mortgage-backed securities	no limit	no limit	no limit	limit	no limit
Semi-stat, state and municipal entities	no limit	no limit	no limit	limit	no limit
VaR (currently not published)	n/a	n/a	n/a	n/a	n/a

⁽²⁾ only through indices

⁽³⁾ Reflects local rates for securities issued by Mexican national companies | Mexico. There are no limits for AAA rated securities, 50 percent limit for AA, 20 percent limit for A rated securities.

⁽⁴⁾ Development banks, non-bank banks, commercial banks and other financial services.

Source: Development banks, nonbank banks, commercial banks and other financial services

- **Regulation restricting supply of risky financial assets.** Many EMs (e.g., China) do not allow issuance of high-yield debt or other non-plain vanilla financial assets. This prevents the development of a whole asset class in such countries, thereby restricting the supply of financial assets.

D. Other Reasons for Asset Shortages in EMs

- **Home bias (for political reasons).** While investors in EMs often are keen to invest their assets overseas as a store of value, worsening macroeconomic conditions of advanced economies in recent years, compared to EMs, has made it increasingly risky to invest in these regions, as epitomized by the recent crisis. Also, from the Balassa-Samuelson

effect⁴, we know that EMs should expect their real equilibrium exchange rate (REER) to appreciate over time, meaning that overseas investment in AEs will be subject to capital losses arising from exchange rate appreciation. Finally, the investments of Middle Eastern and Chinese investors in AEs are being increasingly scrutinized, thereby creating considerable uncertainty (as epitomized by the failure of Dubai World and CNOOC to acquire Western assets owing to political opposition). Such uncertainty has made investment overseas less attractive, thereby reducing access to an important asset class.

- ***Increasing appetite for EM assets by AEs.*** As part of portfolio diversification, advanced country portfolio managers have been increasingly investing part of their portfolios in EMs, thereby reducing the supply of domestic financial assets available to EM domestic investors.

IV. THEORETICAL MODEL

Asset shortages can arise from many different factors as discussed above. The starting point is Elul (1997), who proved that unspecified market incompleteness can either increase or decrease interest rates in a generic Radner's (1972) equilibrium with incomplete markets.⁵

Asset shortages and asset prices

First, we will show that lack of liquidity in asset markets can lead to high asset prices, following Espinoza, Goodhart and Tsomocos, 2009. The starting point is to assume that trade takes place in an exchange economy (no production), between two agents who want to trade across two periods, period 0 (now) and period f (future). Agents require cash as a derived demand, because cash is needed before commodities transactions, and receipts of sales cannot be immediately used to buy commodities.

Following, Espinoza and others (2009), there are two different concepts of liquidity. First there is the supply of cash by the Central Bank, or by the banking system in general. Second, liquidity refers to the easiness with which commodities and assets can trade. For the purpose of the current paper, the focus is on the second definition of liquidity.

The model is built around two periods, 0 (now) and f (future). Each period is divided into sub-periods at which different commodity and money markets meet. The state of nature is revealed after the closure of the money market and default settlement in period 0, and before the opening of the money market in the next period. Similarly, default settlement in the future occurs after the closure of the money market. For the purpose of our paper, we assume

⁴The Balassa-Samuelson effect postulates that if the productivity growth differential between the traded and non-traded goods sectors is larger in the developing countries than in advanced ones, then the relative price of non-traded to traded goods will be rising faster in the developing than in advanced countries, leading to an exchange rate appreciation.

⁵In the context of a general equilibrium, Radner (1972) extended the Arrow-Debreu equilibrium, and is the first framework to be consistent with the incomplete market framework.

money supply is exogenous and random. There are n possible states of nature, indexed by $i \in \mathcal{N} = \{1, \dots, n\}$ with probabilities all equal to $\frac{1}{n}$.

In addition to these $n+1$ money markets, the two agents can trade n Arrow-Debreu securities $(AD_i)_{1 \leq i \leq n}$ that give 1 in state i and 0 in all other states $j \neq i$. All Arrow-Debreu securities are available for trade and therefore financial markets are complete with this structure. To ensure a positive value for money and nominal determinacy, a cash-in-advance model with default is used. Furthermore, default is only allowed in the money markets for the sake of simplicity, because the model is in a complete market setting, any possible default in the asset market will affect the Arrow-Debreu state prices.

There are two agents, α and β in the model. For any period or state of nature, each agent can pay b units of money to buy b/p units of good, or can sell q units of good and receive pq unit of money. Hence consumption in each period or state is

$$c = e - 1 + \frac{b}{p}$$

Notice, either $q = 0$ (agent wants to buy) or $b = 0$ (agent wants to sell), can happen in this one-commodity economy.

Agent α does not own any good in period 0 but owns $e > 0$ units of the consumption good in the future, where e is non-random. Variables without subscript refer to agent α who will be the borrower—while variables with superscript $*$ will refer to agent β , who will be the lender. Agent α maximizes an inter-temporal von Neumann-Morgenstern utility function with discount factor 1, and logarithmic felicity function u .

In period 0, agent α sells q_{ADi} securities at price θ_i to finance consumption at time 0.

In period future, state i , agent α has to give q_{ADi} to agent β . Since agent α cannot yet use the receipts of the goods he is about to sell, he borrows $\frac{\mu_i}{1+r_i}$ from the Central Bank to pay

agent β the q_{ADi} he owes him. He can then use the receipts of his sales $p_i q_i$ to repay the short-term loan μ_i that he had contracted with the Central Bank. However, agent α defaults on a share d_i of his repayment to the Central Bank. Therefore, agent α repays only $\mu_i(1-d_i)$ to the Central Bank, and he incurs a utility cost from the total value defaulted, $\mu_i d_i$, as in Shubik and Wilson (1977).

Agent α solves the following maximization problem subject to certain constraints. The corresponding Lagrangian multipliers are in the bracket.

$$\begin{aligned} \max_{b_0, (q_i, \mu_i, q_{ADi}, d_i)_{i \in \mathcal{N}}} & \ln\left(\frac{b_0}{p_0}\right) + \frac{1}{n} \left(\sum_{i \in \mathcal{N}} \ln \mu_i - q_i \right) - \lambda \max (d_i, \mu_i; 0) \\ \text{s.t. } & b_0 \leq \sum_{i \in \mathcal{N}} \theta_i q_{ADi} \quad (\varphi) \end{aligned}$$

$$\begin{aligned}\forall i \in N \quad q_{ADi} &\leq \eta_i \mu_i \quad (\Psi_i) \\ \mu_i(1-d) &\leq p_i q_i \quad (\chi_i)\end{aligned}$$

Agent β is endowed with e_0^* units of good in period 0, but has nothing in the future. He has the same preference as agent α .

In period 0, agent β sells q_0^* to agent α and invests the proceeds to be consumed in the next period, lending to agent α with repayment conditional on the state of nature. However, he receives the cash only at the end of period 0, after the securities market meets. He first

borrowes $\frac{\mu_0^*}{1+r_0}$ from the Central Bank. He will repay the loan with the receipts of his sales $p_0 q_0^*$. Since agent β also defaults by d_0^* , he will repay only $\mu_0^*(1-d_0^*)$.

In state i (period future), he receives the state-contingent repayments from agent α and he uses it to buy $\frac{b_i^*}{p_i}$ units of the consumption good. Therefore, agent β 's maximization is:

$$\max_{q_0^*, (b_i^*, b_{ADi}^*, \mu_0^*, d_0^*)_{i \in N}} \ln(e_0^* - q_0^*) + \frac{1}{n} \left(\sum_{i \in N} \ln \left(\frac{b_i^*}{p_i} \right) - \lambda \max(d_0^* \mu_0^*, 0) \right)$$

$$\begin{aligned}\text{s.t.} \quad \sum_{i \in N} b_{ADi}^* &\leq \eta_0 \mu_0^* \quad (\varphi^*) \\ \mu_0^*(1-d_0^*) &\leq p_0 q_0^* \quad (\xi^*) \\ \forall i \in N \quad b_i^* &\leq \frac{b_{ADi}^*}{\theta_i} \quad (\chi_i^*)\end{aligned}$$

A monetary equilibrium occurs in is the following setting:

- (i) Agent maximizes utility.
- (ii) Commodity markets clear, i.e.,

In period 0, agent can buy q_0 units of good with b_0 units of money at price p_0 on the other hand the agent can sell q_0 units of goods at price p_0 and receive b_0 units of money :

$$p_0 = \frac{b_0}{q_0} \Leftrightarrow p_0 q_0 = b_0 \quad \square \quad \square \quad \square$$

Similarly for \square period future, in all states $\forall i \in N \quad p_i = \frac{b_i^*}{q_i} \Leftrightarrow p_i q_i = b_i^* \quad \square$

- (iii) Money and AD security markets clear when

$$\mu_0^* = (1+r_0)M_0 = M_0 / r_b$$

i.e., the total money demand equals to the money supplied by the Central Bank in period 0

$$\forall i \in N \quad \mu_i = (1 + r_i)M_i = M_i / \eta_i$$

Similarly the money demand has equal to supply in period future for all states i .

$$\forall i \in N \quad \theta_i q_{AD} = b_{AD}^*$$

This condition states the AD security clearing condition.

We will focus on the case with positive default ensures positive interest rates and removes the nominal indeterminacy.

The following propositions determine the value of money and are consistent with the quantity theory of money in a cash-in-advance model with active default (see also Espinoza and others, 2009 for proof).

Proposition 1 (Short-term interest rates) – shows that short-term interest rates r_0 are inversely related to the supply of money M_0 by Central bank.

$$r_0 \approx d_0^* = 1 - \lambda M_0$$

$$\forall i \in N \quad r_i \approx d_i = 1 - \lambda M_i$$

□

□

Note: Trade is itself determined by the quantity of money, which is why only money supply appears in Proposition 1.

Proposition 2 (Quantity theory of money) – shows that the Quantity Theory of Money holds in a liquidity-constrained economy i.e., the nominal activity $p_0 q_0^* = b_0$ is equal to the supply of money M_0 .

$$p_0 q_0^* = b_0 = M_0$$

□

$$\forall i \quad p_i q_i = b_i^* = M_0$$

□

□

In what follows, we show liquidity can affect the AD state prices.

The first order conditions for agent β 's maximization problem are: (Denote L the Lagrangian formed from β 's maximization problem).

$$\frac{\partial L}{\partial q_0^*} = \frac{-1}{e_0^* - q_0^*} + p_0 \xi^* = 0$$

$$\frac{\partial L}{\partial b_i^*} = \frac{1}{n} \frac{1}{b_i^*} - \chi_i^* = 0$$

$$\frac{\partial L}{\partial \mu_0^*} = -\lambda d_0^* + \eta_0 \varphi^* - (1 - d_0^*) \xi^* = 0$$

$$\frac{\partial L}{\partial b_{AD}^*} = -\varphi^* + \frac{\chi_i^*}{\theta_i} = 0$$

$$\frac{\partial L}{\partial d_0^*} = -\lambda \mu_0^* + d_0^* \xi^* = 0$$

Therefore, it can be deduced that:

$$\theta_i b_i^* = \theta_j b_j^*$$

From proposition 2, we have $b_i^* = p_i q_i = M_i$ hence leading to:

$$q_i > q_j \Leftrightarrow M_i > M_j \Leftrightarrow b_i^* > b_j^* \Leftrightarrow \theta_i < \theta_j$$

In conclusion, the cost of consumption is equal to the cost of transferring money from period 0 to period f (i.e., state prices), multiplied by the value of trade in period f (i.e., the price of the good multiplied by the volume traded). Under the quantity theory of money, the value of trade is equal to the overall supply of liquidity (i.e., $b_i^* = p_i q_i = M_i$). In particular, if there is less liquidity in state 1 than state 2, the value of trade in state 1 has to be lower than the value in state 2, however according to $\theta_i b_i^* = \theta_j b_j^*$, this is only possible if the cost of financing in state 1 is higher, hence a higher state price is associated with a low liquidity (volume of trade).⁶

As observed in EMs, because of the shortage of financial assets, investors tend to hold on to the financial assets (i.e., q is smaller), meaning lower liquidity. This in turn leads to higher AD security prices, confirming the impact of asset shortages on liquidity. Having now theoretically demonstrated the impact of asset shortages, we will now empirically estimate it.

V. ASSET SHORTAGE INDEX

We define our asset shortages index by capturing the difference between demand and supply for financial assets. Domestic demand for assets (latent asset demand) is proxied by gross domestic savings (i.e., all the resources available to invest), while the supply of financial assets is defined as domestic issuance of bonds, loans, and equity, as well as the net purchase of foreign assets and domestic assets by foreign investors. In addition, the change in short-term deposits also is considered to be adding to the supply of financial asset, because it

⁶Intuitively, the model implies that the cost of consumption is constant across all states since all states have been assigned equal weights, due to Cobb-Douglas utility specification. The cost of consumption is equal to the price of the good (i.e., the opportunity cost to transfer money - the Arrow-Debreu price, from period 0 to the next period f) multiplied by the value of trade in period f. In period f, if state 1 has more liquidity than state 2, the value of trade in state 1 must be higher than the value of trade in state 2, because the quantity theory of money (i.e., the nominal activity is equal to the supply of money) holds in the cash-in-advance economy (see proposition 2). This is possible only under the condition that, the cost of transferring money in state 1 (i.e., the state price) is lower than the cost of transferring money in state 2. As a result, the model suggests that a state with lower interest rate is associated with high liquidity (see proposition 1), and is also attached with a lower state prices (asset price), and vice versa.

reflects the temporary parking of funds, which could be motivated by a willingness to hold liquid assets as a precaution (see Box 2 for an illustration).⁷

To estimate our asset shortages (AS) index, we use the following formula:

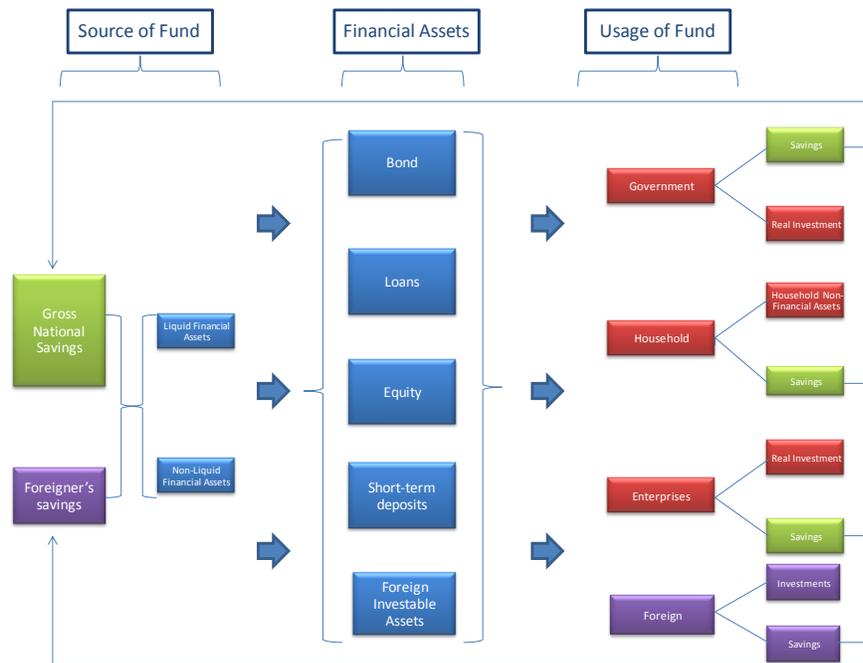
$$AS = 1 - \left(\frac{B + E + L + \Delta S.D. + NPFA}{S} \right) \quad (1)$$

where S=domestic national savings, B=bond issuance in the domestic market, E=equity issuance in the domestic market, L=loan issuance in the domestic market, and S.D.= short-term deposits. NPFA= net purchase of foreign financial assets by domestic residents, which reflects the position of domestic investors' holdings of foreign assets (debt, equity, financial derivatives, other investments) minus the net position of foreign investors' holdings of domestic assets. The sum of $B + E + L + \Delta S.D. + NPFA$ is therefore a reflection of the supply of financial assets.

⁷The supply of financial asset is modeled in the same spirit as Caballero, Farhi and Gourinchas (2008), who defined the supply of financial asset as $V_t = \delta PV_t$, where PV_t denote the present value of the economy's future output, and the parameter δ represents the share of PV_t that can be capitalized today and transformed into a tradable asset hence the total asset issued in domestic economy. The δ parameter captures the level of financial development in an economy, intuitively for a given level of future output, a higher δ implies domestic agent (enterprise, government or household) can borrow more against their future income, this is equivalent as saying agents can issue more financial assets (Bond, Equity and Loans).

Box 2. Flow of Funds of Assets

The diagram below illustrates the foundation of the asset shortage index, in which household savings is being invested in either liquid or nonliquid financial assets. On the demand side, enterprises, government and households issue new loans, bonds, or equity to finance their real investment project (or consumption), ranging from a new mortgage to a new enterprise. Alternatively, they finance projects either by reducing short-term assets or through foreign borrowing. According to the system of national accounts, the national financial account comprises seven categories of investment assets: (1) monetary gold; (2) currency and deposits; (3) securities other than shares; (4) loans; (5) shares and other equity; (6) insurance technical reserves; and (7) other accounts receivable. In our asset shortage index, we have captured the currency and deposits, loans, and shares and other equity. The remaining terms, for the purposes of the AS-Index are unlikely to be significant. For example, monetary gold is mainly an investment option for the central banks. Also, the level of monetary gold reserves in the central bank does not vary from year to year, so in the overall economy monetary gold has very little relevance to asset shortages. Insurance technical reserves are very small in EMs, and data limitations made it impossible to include it in our index. Other accounts receivable is in general small in EMs; limited and underdeveloped credit ratings data make it difficult for companies to assess the risk of lending. Moreover, the duration of such a transaction is very short, limiting its importance.



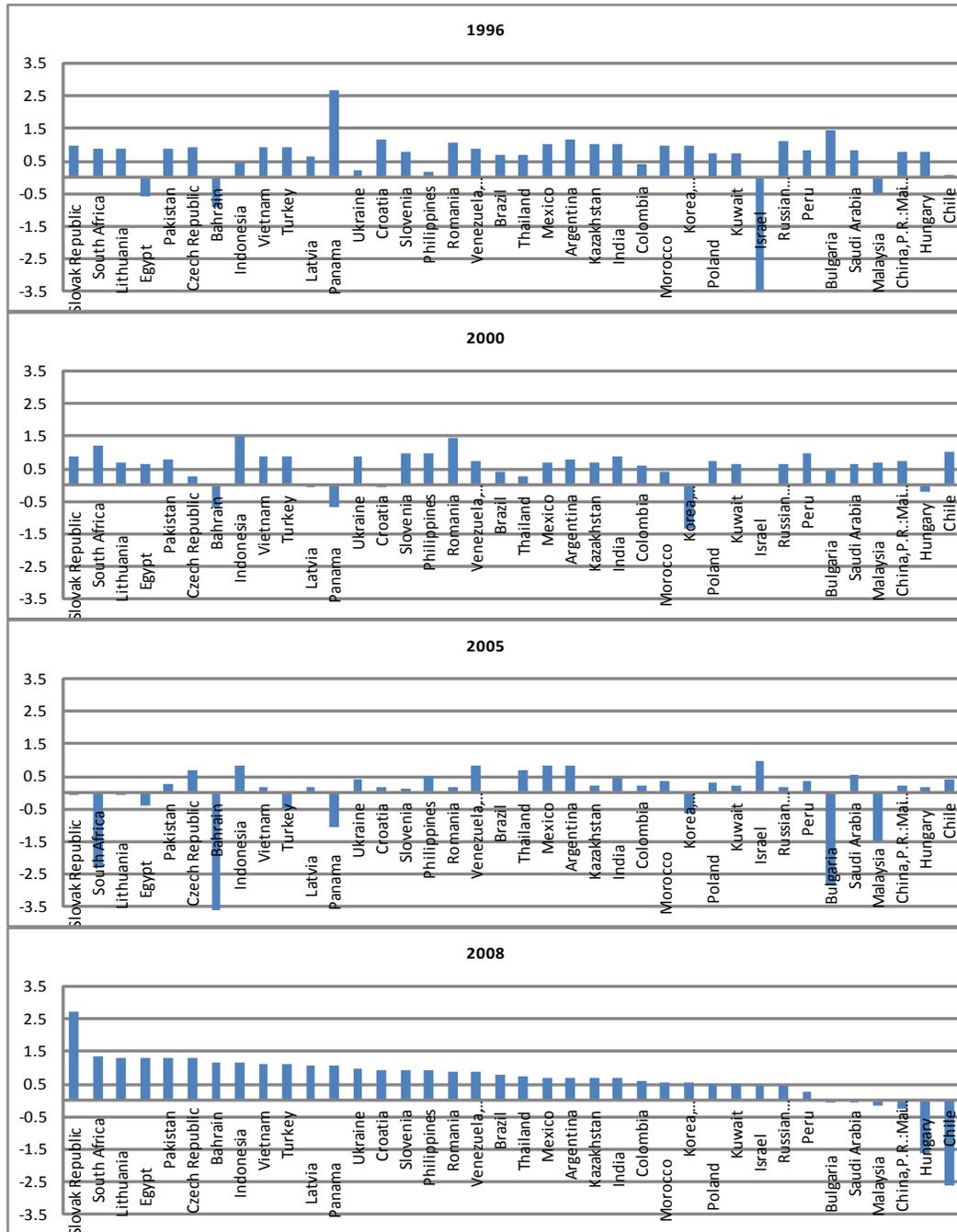
Using available data, the asset shortage index for 41 EMs was constructed from 1996–2008.⁸ Depending on the issuing country and issuing market, we combined a number of databases to obtain the most comprehensive data set that is consistent across countries. The variables used to construct the Asset Shortage Index are as follows:

- *Gross national savings.* The data for gross national savings reflect gross national disposable income subtracted by total expenditure; it represents economic resources available for investment. The dataset on gross domestic savings was obtained from the World Development Index (WDI) or was constructed from the World Economic Outlook (WEO) when WDI data were not available.
- *Bond, equity, and loan issuance.* Dealogic records all the domestic issuances of bonds and equity. Loan issuance is based on data from Bankscope. For each country, the bond, loan and equity issuances were aggregated for each year.
- *Net purchase of foreign financial assets.* In an open economy, when a domestic resident purchases assets overseas (debt, equity, financial derivative, other investments), it represents an increase in the supply of financial assets for the domestic investor. Similarly, when a foreigner buys domestic assets, this is equivalent to a reduction in domestic financial assets available to domestic investors. Foreign institutional investors' interest in emerging markets has surged in recent years, because of improved sovereign liability management, resulting in a secular increase in demand for both external and local EM asset classes. Increases in privatization, improvements in investment climate, and easing of capital account regulations, resulting in a rapid rise in the share of the investable portion of the local equity market, have also attracted foreign institutional investor participation. Data for net purchase of foreign financial assets are obtained from balance of payment statistics.
- *Change in short-term deposits.* Part of an economic agent's assets is parked in short-term deposits, as a precaution against uncertainty, for instance. Investors can temporarily park funds as short-term deposits, creating a temporary investment vehicle. Data for short-term deposits are obtained from Bankscope, which aggregates all the banks' balance sheets to construct short-term deposits in an economy.

It is clear from the asset shortage index that, in recent years, asset shortage has become a rising issue in EMs, with few countries left out (Figure 2). The four snapshots—1996, 2000, 2005, and 2008—indicate that asset shortage is a general EM problem, with slight regional variations (e.g., the Middle East, which benefited from the oil windfall, and East Asia, which benefited from the manufacturing boom) and with some variations over time.

⁸The EMs are Argentina, Brazil, Chile, Colombia, Mexico, Panama, Peru, Venezuela, China, Hong Kong, India, Indonesia, Korea, Malaysia, Philippines, Taiwan, Thailand, Vietnam, Bahrain, Egypt, Israel, Kazakhstan, Kuwait, Morocco, Pakistan, Saudi Arabia, South Africa, Turkey, UAE, Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovak Republic, Slovenia, Ukraine.

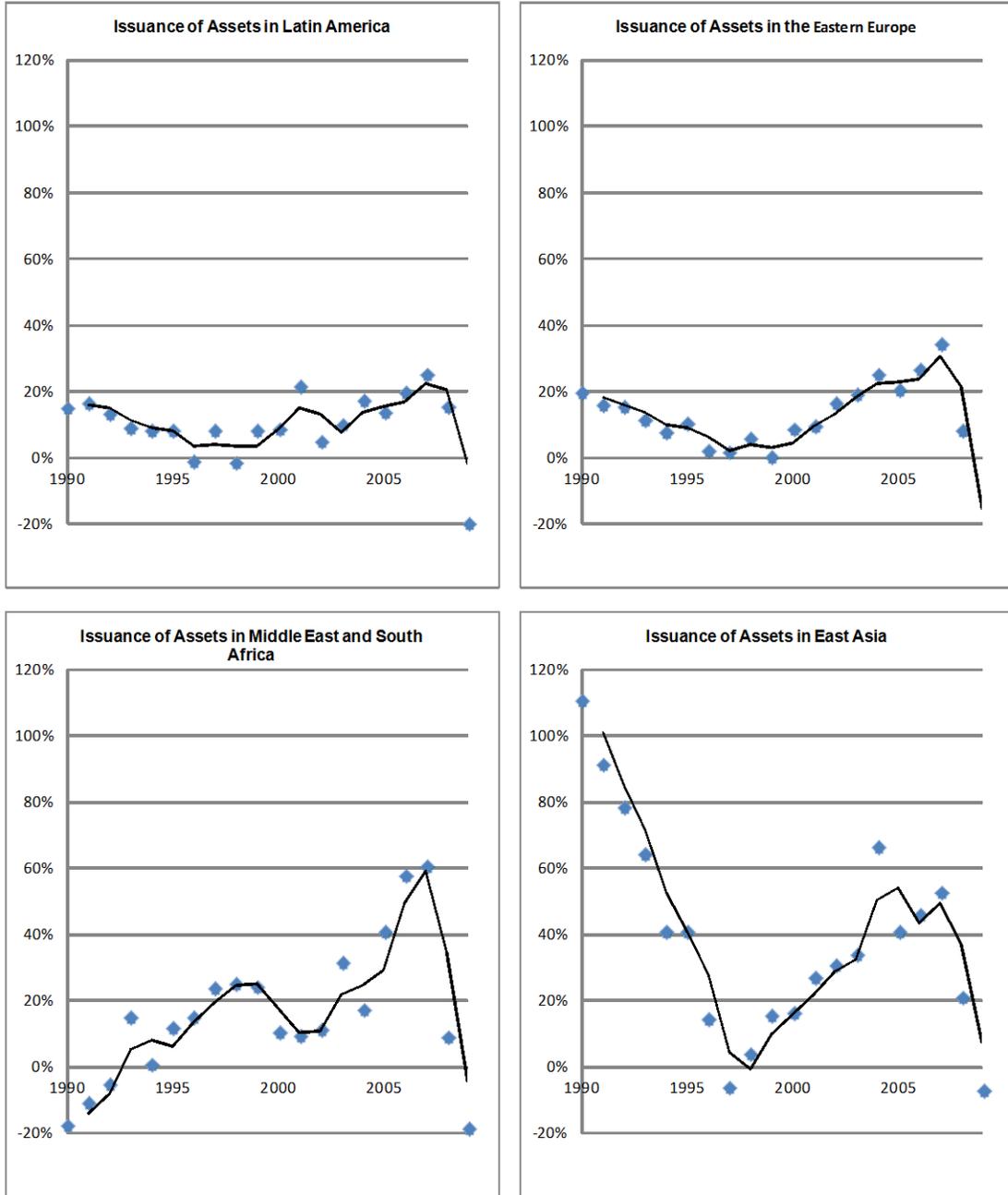
Figure 2. Asset Shortage Index



Source: Dealogic, WEO and WDI

Issuance of financial assets has been on an upward trend regionally—until the recent crisis—but with low levels relative to GDP (negative numbers mean that the reduction in cash deposits outweighs issuance of bonds, equity, and loans). Regional variations are striking. East Asia, the Middle East, and Africa appear to have the highest issuance of financial assets, while Latin America and Eastern Europe lag behind (Figure 3).

**Figure 3. Asset Issuance by Region, 1990–2009
(as a share of GDP)**



Source: Dealogic, WEO and WDI

Bond and loan issuance has been the principal source of financial assets in EMs, with equity issuance starting only in the mid-2000s. While the Asian crisis has dented some of the supply of bonds, in the last decade there has been a rise in both domestic bond issuance and loan issuance, though the latter has seen a sharp fall during the global crisis. Equity issuance, on the other hand, started growing rapidly only in 2005, from very low levels, and was negatively affected by the crisis. Net purchase of foreign financial assets, while initially positive, has turned negative in recent years as domestic investors have started to pick up foreign financial assets, suggesting that foreigners are buying relatively more domestic financial assets (Figure 4).

**Figure 4. Issuance of Financial Assets in Emerging Markets, 1990–2008
(as a share of GDP)**



Source: Dealogic

VI. EMPIRICAL ESTIMATION

A. Methodology

We will proceed by estimating the determinants of the asset shortage (AS) index. In macroeconomic panel regressions, various estimation issues are encountered that must be addressed to make appropriate inferences. The first major hurdle is the omitted variables bias, which can lead to possible correlation between the regressors and the error term. Second, two-way causality between the dependent variable and the explanatory variables is likely to be present, which leads to inconsistent estimators. The third problem—specific to dynamic panels—is the “dynamics panel bias,” from the inevitable correlation between the lagged dependent variable and country-specific fixed effects (Alvarez and Arellano, 2003).

System-GMM is used instead to carry out the estimations (Arellano and Bover, 1995; Blundell and Bond, 1998). While it still might suffer from weak instrument bias, it provides consistent and more efficient estimators. It reduces the bias by incorporating more moment conditions, with these additional moment restrictions also being tested. The regressions are run on first-difference and not on levels, owing to concerns about trending variables and unit root. The test statistics indicate that the instruments are valid, and that there is no serial correlation in the error term, which allows us to carry on with the system-GMM method. We can therefore proceed with the following estimation (results are in Table 1):

$$\begin{aligned}
 \text{Asset Shortage Index}_{it} = & \\
 & \beta_1 A.S. Index_{it-1} + \beta_2 \ln(\Delta GDP_{it}) + \beta_3 Inflation_{it} + \beta_4 \Delta Real Interest Rate_{it} + \\
 & \beta_5 Country's Credit Rating_{it-1} + \beta_6 RER_{it-1} + \beta_7 Govt. Fiscal balance_{it-1} + \\
 & \beta_8 Govt. Stability_{it} + \beta_9 World GDP Growth_{it} + \beta_{10} X + \varepsilon_{it}
 \end{aligned} \tag{2}$$

with the countries defined in Appendix 2, the correlation matrix displayed in Appendix 3. Appendix 4 provides a detailed discussion on system-GMM, while the key variable and their sources in Appendix 5. The variables were chosen on theoretical grounds (see below).

B. Key Findings

There is strong evidence of asset shortage persistence. An asset shortage in the previous period has a negative impact on asset shortages in the current period, with significance at the 1 percent level. This implies that the imbalance between asset supply and asset demand is not being addressed rapidly by capital markets, which could reflect impediments to asset creation.

Government stability is found to reduce the AS index. Across the various specifications, some statistically significant evidence shows that as government stability improves—presumably leading to a more stable investment climate—investors might be more willing to supply financial assets because uncertainty is diminished. If openness and change in GDP per capita are added as additional variables in the regression, the explanatory power of government stability is reduced—probably because of their co-linear relationship with this variable.

Table 1. System GMM Regression Output for Macroeconomic Variables Explanation of the Index

Independent variables	Asset Shortage Index								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A.S. Index (t-1)	0.289*** (0.046)	0.266*** (0.041)	0.262*** (0.072)	0.292*** (0.046)	0.280*** (0.048)	0.283*** (0.049)	0.293*** (0.045)	0.285*** (0.047)	0.288*** (0.051)
Log ΔGDP	0.0577** (0.0282)	0.063** (0.028)	0.074 (0.048)	0.058* (0.028)	0.052* (0.026)	0.075** (0.028)	0.068** (0.029)	0.061** (0.028)	0.057** (0.027)
Inflation	0.0433 (0.0330)	0.048 (0.034)	0.069 (0.052)	0.046 (0.033)	0.045 (0.034)	0.049 (0.034)	0.043 (0.032)	0.047 (0.033)	0.042 (0.031)
ΔReal interest rate	-0.00748 (0.0167)	-0.012 (0.018)	0.004 (0.016)	-0.003 (0.015)	-0.008 (0.017)	-0.009 (0.017)	-0.004 (0.017)	-0.006 (0.017)	-0.008 (0.017)
Country's credit rating (t-1)	-0.0976 (0.0691)	-0.032 (0.082)	-0.071 (0.089)	-0.103 (0.071)	-0.074 (0.083)	-0.083 (0.070)	-0.063 (0.073)	-0.100 (0.067)	-0.096 (0.069)
De facto exchange rate (t-1)	0.0467 (0.0896)	-0.006 (0.082)	-0.049 (0.157)	0.047 (0.092)	0.037 (0.091)	0.046 (0.090)	0.041 (0.089)	0.045 (0.089)	0.049 (0.085)
Government fiscal bal. (t-1)	1.620* (0.917)	0.574 (1.166)	1.878 (1.258)	1.690* (0.933)	1.427 (0.944)	1.657* (0.898)	1.320 (0.938)	1.849** (0.846)	1.544* (0.901)
Government stability	-0.105* (0.0590)	-0.089 (0.062)	-0.130 (0.080)	-0.107* (0.059)	-0.098* (0.056)	-0.107* (0.059)	-0.111* (0.059)	-0.103* (0.059)	-0.104* (0.056)
World GDP growth	-4.728* (2.396)	-4.849* (2.388)	-4.132 (2.719)	-4.580* (2.423)	-4.761* (2.356)	-6.331** (2.618)	-5.400** (2.445)	-4.601* (2.386)	-4.765* (2.468)
Openness (t-1)		-0.004* (0.002)							
Log Δ GDP per capita (t-1)			-0.043 (0.064)						
Crisis dummy (t-1)				-0.570** (0.215)					
Regional dummy (Latin America.)					0.165 (0.169)				
Regional dummy (East Asia)					0.032 (0.196)				
US nominal interest rate						-0.109*** (0.039)			
Corruption (t-1)							-0.120* (0.064)		
Dependency ratio								-0.892 (1.107)	
Common law (UK legal origin)									-0.045 (0.210)
Arellano-Bond test for AR(2) In first differences	0.214	0.205	0.469	0.199	0.210	0.142	0.217	0.210	0.213
Hansen test of override restrictions	0.986	0.985	0.985	0.982	0.982	0.982	0.981	0.982	0.980

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

GDP growth worsens the AS index, confirming that economic growth and supply of financial assets do not grow together. The coefficients are significant across all the different specifications, confirming that the issuance of financial assets is not dependent on economic growth per se. A country can therefore grow despite limited financial assets.

A stable macroeconomic environment—proxied by low inflation—encourages the issuance of financial assets, because it reduces the level of risk, though the statistical significance of this variable is not always strong.

A country's credit rating has no significant power in explaining asset shortages. This means investors are less concerned about a country's credit rating when making investment decisions.

Change in real interest rates is not statistically significant in explaining the AS index, suggesting that interest rates do not act as an equilibrium force between supply and demand for assets in EMs. Under the incomplete market setting that characterizes EMs, this is to be expected, because savings and the supply of financial assets do not necessarily respond rapidly to interest rate signals in these cases, because of information and transaction costs, for instance. The supply of financial assets is inelastic to interest rates and dependent on other factors.

The exchange rate regime is insignificant in explaining the AS index. The impact of a stable exchange rate is theoretically ambiguous. We could have expected that a stable exchange rate policy, by reducing exchange rate risk, would make issuance of financial assets in overseas markets more attractive. At the same time, domestic savers might prefer to park their savings overseas to diversify away from risk, thereby reducing domestic asset shortages.

Government fiscal balance has a positive impact on the AS index. As expected, countries in better fiscal positions have lower AS indexes. Although a small budget deficit—the raw material for securitized government debt—is needed to create a benchmark on how to price other financial assets and thereby encourages the supply of financial assets, large deficits have an inverse impact on the AS index by creating instability. However, it is not significant across all specifications of the regressions, presumably because the explanatory variable is highly co-linear.

World growth appears to have a small, but statistically significant impact on reducing asset shortages. The coefficients on world GDP growth are all negative and significant at 10 or 5 percentage levels. Why this finding? First, domestic exporting companies will increase their investment level, hence issuing more financial assets. In addition, higher world growth makes foreign assets more attractive to domestic investors, leading to an outflow of savings overseas.

Openness, as measured by world trade, has a negative, though weakly significant, impact on the AS index. Globalization has in most cases proceeded gradually, liberalizing trade before liberalizing the capital account. As the domestic economy becomes more integrated into the world economy, an EM can improve its welfare by specializing in products in which it has a

comparative advantage, thereby increasing its income. Initially, if the capital account is still closed, the domestic firm will issue more financial assets domestically, thereby reducing the AS index.

GDP per capita is insignificant in explaining the AS index. This means that asset shortage is not explained by the level of economic development and can affect rich Gulf countries as much as Latin American countries.

The coefficient of the crisis dummy is negative and significant at the 1 percent level. This reflects the fact that, during a crisis, savings fall more rapidly than does the issuance of financial assets and is consistent with the view that savings collapse during a crisis, thereby reducing the asset shortage imbalance.

Change in corruption has a negative coefficient and is statistically significant, though only at the 10 percent level. By increasing uncertainty, and hence the cost of doing business, asset issuance becomes less likely. Therefore, the more corrupt countries have bigger asset shortage problems.

US interest rates have a negative and significant explanatory power in the AS index. As overseas asset returns increase, they become, relatively speaking, more attractive to domestic investors. The resulting large capital outflow effectively reduces domestic asset shortages.

The dependency ratio—the ratio of individuals under 15 or over 65 relative to the working population—does not have a statistically significant impact on asset shortages. We would expect that as the dependency ratio falls in EMs, rising incomes and savings should initially outpace the supply of financial assets. However, as our group of EMs is heterogeneous, cultural and institutional differences could explain the variation in the saving rates, independent of the dependency ratio. Also, income, regardless of the dependency ratio, might be unequally distributed in many EMs.

Regional variations do not appear to explain the AS index. Both the Latin America and East Asia regional dummies are statistically insignificant in explaining asset shortages, implying that regional differences are not important in explain differences in asset shortages across countries.

If we analyze institutional differences, as proxied by the difference between common law jurisdictions (as proxied by UK legal origin) from civil law ones, we do not have a statistically significant effect either. Although La Porta and others (1997) suggest that common law is associated with more dynamic economies, because it protects creditors more strongly, we find this effect does not matter for asset shortages. This means that imbalances in savings and financial assets are not affected by institutional differences.

C. Regulation

As argued above, regulations are another important determinant of asset shortages. So far, our analysis has focused primarily on macroeconomic variables, but institutional factors also affect asset shortages. In what follows we will study the impact on asset shortages of

regulations imposed by national authorities. In EMs, the regulatory environment is often very stringent, which could be a reason for the large AS index. Econometrically, using system-GMM is complicated by the fact that most regulatory variables are dummy variables or variables that contain limited variance, making it difficult to obtain a set of valid instruments. Furthermore, when regulations are implemented, asset shortages are typically not a major consideration, such that reverse causality (from asset shortages to regulation variables or when these indicators were constructed they did not take asset shortage into consideration) is likely to be weak. The random effects can yield a more efficient estimator; however, random effects do not always guarantee a consistent estimator. Therefore the Hausman test (not reported) to investigate the consistency of the RE estimator is used; as it cannot be rejected, the more efficient RE will be employed (for completeness, both FE and RE are illustrated).

We estimate the following regression:

$$\begin{aligned} \text{Asset Shortage Index}_{it} = & \\ & \beta_1 \text{Capital Account Openness}_{it-1} + \beta_2 \text{Inst. Democracy}_{it-1} + \beta_3 \text{Business Freedom}_{it-1} + \\ & \beta_4 \text{Financial Freedom}_{it-1} + \beta_5 \text{Property Rights}_{it-1} + \beta_6 \mathbf{X} + \varepsilon_{it} \end{aligned} \quad (3)$$

Capital account openness, institutional democracy, business freedom, financial freedom, property rights, and institutional investors' regulations, and other variables are added to the regression individually. Note that the R-squared measure of goodness of fit is quite low (see Table 2). This is not unexpected, as we are using regulation variables on the right hand side, which, because of lack of granularity, have low variability.

The coefficients of capital account openness are negative and significant. Capital account openness is a variable constructed by Chinn and Ito (2008) and is an index that measures the extent of restrictions on external accounts, with a higher value reflecting more open cross-border capital transactions. This result suggests that by widening the investment universe for domestic institutional investors in EMs, and allowing savings to be invested overseas, the domestic AS problem is reduced.

The business freedom index is statistically significant and negative, suggesting that a friendlier business environment reduces the AS index. The business freedom score is composed of various factors with equal weights: procedures, time, cost, and minimum capital for starting a business, obtaining a license and the time, cost recovery rate for closing a business. The business freedom index ranges from 0 to 100; a higher value implies a more friendly business environment. As the business environment improves, investors will find it easier to create new businesses and invest, thereby increasing the supply of financial assets and decreasing the asset shortage.

Table 2. Fixed Effect/Random Effect Estimations for the Asset Shortage Index

Independent variables	Asset Shortage Index							
	FE	(1) RE	FE	(2) RE	FE	(4) RE	FE	(5) RE
K.A. openness (t-1)	-0.184*	-0.213***	-0.188*	-0.200**	-0.189*	-0.221***	-0.207*	-0.223***
	(0.103)	(0.082)	(0.109)	(0.087)	(0.108)	(0.084)	(0.107)	(0.084)
Business freedom (t-1)	-0.027**	-0.033***	-0.028**	-0.033***	-0.029**	-0.034***	-0.030**	-0.034***
	(0.013)	(0.011)	(0.013)	(0.011)	(0.013)	(0.011)	(0.013)	(0.011)
Financial freedom (t-1)	-0.004	-0.006	-0.003	-0.004	-0.003	-0.005	-0.004	-0.005
	(0.008)	(0.007)	(0.009)	(0.007)	(0.009)	(0.007)	(0.009)	(0.007)
Property rights (t-1)	0.026***	0.020***	0.024**	0.018**	0.025***	0.019***	0.021**	0.018**
	(0.009)	(0.007)	(0.010)	(0.008)	(0.009)	(0.007)	(0.010)	(0.008)
Economics risk (t-1)			-0.009	-0.021				
			(0.027)	(0.024)				
Government stability (t-1)					0.026	-0.008		
					(0.067)	(0.062)		
Law and order (t-1)							0.253	0.082
							(0.160)	(0.119)
Constant	0.927	1.693**	1.315	2.441**	0.771	1.814**	0.370	1.499*
	(0.879)	(0.692)	(1.396)	(1.096)	(1.028)	(0.859)	(0.972)	(0.772)
Observations	442	442	432	432	432	432	432	432
R-squared (overall)	0.048	0.070	0.055	0.076	0.049	0.073	0.035	0.067
Number of id	37	37	37	37	37	37	37	37

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

The financial freedom index, stronger property rights, and macroeconomic risks have no significant impact on asset shortages. The financial freedom index is a measure of government intervention in the financial markets, with higher values representing fewer regulations imposed by the government. Our finding shows that countries with stronger government intervention in capital markets do not have larger asset shortages than less interventionist countries. Stronger property rights are not found to lead to greater issuance of financial assets. Intuitively, it would be expected that stronger property rights, by increasing protection, should be good for asset issuance. As EMs are still catching up, and therefore use existing technologies to grow, stronger property rights may in fact be bad for growth by hindering the copying of existing technologies, and hence increasing asset shortages. Only when countries have reached sufficiently advanced development will property rights be good for asset issuance (Chang, 2001).

Economic risk—a measure of the overall macroeconomic environment—is shown to have insignificant effects on the AS index. The index is a composite of GDP, growth, inflation, balanced budget, and current accounts. This suggests that improving economic stability does not matter for our countries, perhaps because the countries in our sample are stable enough to generate financial assets.

Law and order has a positive but insignificant impact on asset shortages. This suggests that a stronger legal system, which protects investors more solidly, will not lead to the issuance of more financial assets relative to national savings.

We can conclude that the ease of doing business, rather than economic stability, matters the most in reducing asset shortages. However, macroeconomic factors, as well as regulation variables, also affect asset shortages.

VII. CONCLUSION AND POLICY IMPLICATIONS

In this paper, an index to proxy the asset shortages in EMs by capturing the difference between the demand and supply of financial assets was constructed. This allowed the analysis of the evolution of asset shortages over time. To our knowledge, this is the first such measure to have been constructed. This index provides a quantitative measure to study asset shortages. To reduce the imbalances between supply and demand for financial assets in EMs, but even more so to frontier markets—the subset of emerging markets with small and illiquid market capitalizations—several policy measures could help:

A. Capital Market Development

To spur the supply of financial assets, developing the capital market further is crucial. Improving the efficiency of capital markets helps increase access to financing for the private sector, lowering the cost of financing, distributing risk, and supporting long-term growth. For example, Peru, Chile, and Colombia have implemented measures to integrate their stock exchanges, potentially overtaking Mexico as Latin America's second-largest market. This will facilitate cross-border transactions in stocks and increase trading volume as the greater size and diversity of an integrated stock exchange will lure more investors, such as local

pension funds for whom cross-border investments could then be considered a local rather than foreign asset.

Similarly, many countries have developed alternative markets for mid-cap companies in the early stages of development. Inspired by the success of AIM in London, some EMs have with varying degree of success managed to such markets. Key requirements for this to work though are an investor base willing to take risk and the existence of companies with potential.

B. Improving Regulation to Increase Supply

The authorities should clarify legislation and modify regulations to spur the supply of new financial assets. Regulatory restrictions on the investment of pension funds in Latin American countries in nontraditional instruments (private equity, real estate, lower-rated fixed income products, etc.) and illiquid assets in the stock market have limited the opportunities for growth. Liberalizing these investment restrictions, by widening the investment universe, could increase investment opportunities for EM investors, especially institutional ones. In most EMs, the market for covered mortgage loans is underdeveloped, given vague legal and regulatory frameworks on the treatment of covered bonds in cases of bankruptcy, collateral and matching requirements, and valuation issues. Addressing these issues could pave the way for the growth of covered bond markets in many EMs. Similar reforms may be needed to create an asset backed securities (ABS) market for mortgages.

Governments should develop comprehensive policies to support new companies by fostering private equity and venture capital industries. This can take the form of tax incentives to invest in high risk asset classes, or complementing private investment by public sector co-investment in some ventures targeting earlier stages of development. Brazil and South Africa are successful examples of such policies.

Rules should be set in place to increase the supply of assets further by enforcing a minimum amount of assets that must be listed on a stock exchange. For example, in 2010, the Ministry of Finance in India announced new rules for companies listed on Indian bourses, requiring them to make available, within 5 years, a minimum of 25 percent of equity, as opposed to the existing 10 percent. This should raise liquidity, and thereby reduce volatility.⁹

Countries with many State Owned Enterprises (SOEs) could also launch a program to list and privatize. Malaysia is currently launching such an exercise. While privatization per se is not a panacea in necessarily improving the productivity of SOEs, it does tend to improve governance and profitability of companies, and has the side benefit of increasing the supply of financial assets.

⁹Development of hedging instruments is also important. In this regard, the surge in the use of derivatives to hedge currency and interest rate risk bodes well for more complete capital markets. Korea, Hong Kong, and Singapore have a well-developed interest rate, futures, and currency swap market, respectively, while in countries with capital account restrictions (e.g., China and India), use of the non-deliverable forward market is widespread.

Regulators should remove or reduce the limit on how much institutional investors are allowed by law to invest overseas. This would allow the system to mitigate the excessive exposure to domestic systemic risk and the risk of domestic security prices moving too far from fundamentals. Local market booms tend not to persist indefinitely, and there is a need to protect retirement savings from the swings that characterize most small and open economies. Local markets are poorly correlated with international markets, and thus diversification is likely to pay off in the long term. Furthermore, for crisis-prone economies, domestic systemic risk makes it advisable to partially rely on more stable markets. Finally, it is not necessary for the pension fund manager to deal with foreign asset selection directly, because many reputable international global fund managers with excellent track records can be hired at low cost.

The business environment should be improved. Encouraging entrepreneurs to expand by using capital markets is an important step in increasing asset supply. Too often, going public, which raises the company's visibility, leads to regulatory hurdles and increased costs, thereby discouraging asset issuance.

C. Reducing Savings

One reason EMs have large savings rates is as a precautionary tool. Increasing consumption can therefore also help EMs reduce asset shortages. This can be achieved by Strengthening social safety nets. High saving rates in EMs (e.g., China) have been described as a reflection of high individual risk, related to costs of health, retirement, and education. Therefore it is important to improve the ability of individuals to insure against these types of risks. For example, in 2008 China expanded the “Yi Bao” (a Chinese state health care system) to 229 cities.

In countries where the fiscal position is very strong and infrastructural needs are acute, raising infrastructural investment can be a way of reducing national savings while creating positive externalities for the rest of the economy. Following past crises, governments in EMs have been reluctant to spend money, even if the social rate of return is very high, for fear of over-indebting themselves. However, the positive externality of government spending on growth, such as infrastructure for example, could be even more important if it leads to the supply of financial assets that could spur further development of capital markets.

While there is no magic bullet, a comprehensive set of reforms mentioned above will certainly help reduce the asset shortage problem, and will stimulate the development of EMs further. It will improve the macroeconomic environment of EMs, by spurring growth, leading to a better allocation of resources, and reducing the likelihood of bubbles.

References

- Alvarez, Javier, and Manuel Arellano, 2003, "The Time Series and Cross-Section Asymptotic of Dynamic Panel Data Estimators" *Econometrica*, Vol. 71, No. 4, pp. 1121-1159.
- Arellano, Manuel, and Stephen Bond, 1991, "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations" *Review of Economic Studies* 58: 277-97.
- , 1998, "Dynamic Panel data estimation using DPD98 for Gauss: A guide for users".
- Arellano, Manuel, and Olympia Bover. 1995. "Another look at the instrumental variables estimation of error-component models" *Journal of Econometrics* 68:29-51.
- Blundell, Richard, and Stephen Bond. 1998, "Initial conditions and moment restrictions in dynamic panel data models." *Journal of Econometrics* 87: 11-143.
- Borensztein, Eduardo, Kevin Cowan, Barry Eichengreen, and Ugo Panizza, 2008, "Bond Markets in Latin America: On the Verge of a Big Bang?" Cambridge MA, The MIT Press.
- Caballero, Ricardo, 2006, "On the Macroeconomics of Asset Shortages" *MIT mimeo*.
- Caballero, Ricardo, Emmanuel Farhi and Pierre-Olivier Gourinchas, 2008, "An Equilibrium Model of Global Imbalances" and Low Interest Rates." *American Economic Review* 98:1, 358-393.
- Chinn, Menzie, and Hiro Ito, 2008, "A New Measure of Financial Openness" *Journal of Comparative Policy Analysis*, Volume 10, Issue 3, p. 309 – 322.
- de la Torre, Augusto, and Sergio Schmukler, 2006, "*Emerging Capital Markets and Globalization: The Latin American Experience*", (Stanford, CA: Stanford University Press).
- Eichengreen, Barry, and Ricardo Hausmann, 1999, "Exchange Rates and Financial Fragility", Paper presented at the symposium New Challenges for Monetary Policy, 26 to 29 August, Jackson Hole, WY.
- Elul, Ronel 1997, "Financial innovation, Precautionary Saving and the Risk-free Rate", *Journal of Mathematical Economics*, Vol. 27, pp.113-131.
- Espinoza, Raphael, Charles Goodhart, and Dimitrios Tsomocs, 2009, "State Prices, Liquidity and Default", *Economic Theory*, Vol. 39, pp.177-194.
- GFSR, 2005, "Development of Corporate Bond Markets in Emerging Market Countries" (Washington DC, International Monetary Fund).

Hausmann, Ricardo, and Ugo Panizza, 2010, "Redemption or abstinence? Original sin, currency mismatches and counter-cyclical policies in the new millennium", Center for International Development at Harvard University, Working Paper No. 194.

Im Kyung So, Hashem Pesaran, and Yongcheol Shin, 2003, "Testing for Unit Roots in Heterogeneous Panels." *Journals of Econometrics* 115 (1): 53-74.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1997. "Legal Determinants of External Finance." *Journal of Finance* 52(3): 1131-50. Washington, DC: World Bank

-----, 1998. "Law and Finance." *Journal of Political Economy* 106(6): 1135-55.

Pedroni, Peter, 1999, "Critical Values for Co-integration Test in heterogeneous Panels with Multiple Regressors", *Oxford Bulletin of Economics and Statistics*, Vol. 61, pp. 653 – 670.

Pedroni, Peter, 2004, "Panel Co-integration; Asymptotic and Finite Sample Properties of pooled Time Series Tests, With an Application to the PPP Hypothesis", *Econometric Theory*, Vol. 20, pp.597-625.

Radner, Roy, 1972, "Existence of Equilibrium of Plans, Prices and Price Expectations in a Sequence of Markets", *Econometrica*, Vol. 40, pp.289-303.

Rajan, Raghuram, 2005 "Has Finance Made the World Riskier?"

Rajan, Raghuram, 2006, "Investment Restraint, the Liquidity Glut, and Global Imbalances" <http://www.imf.org/external/np/speeches/2006/111506.htm>.

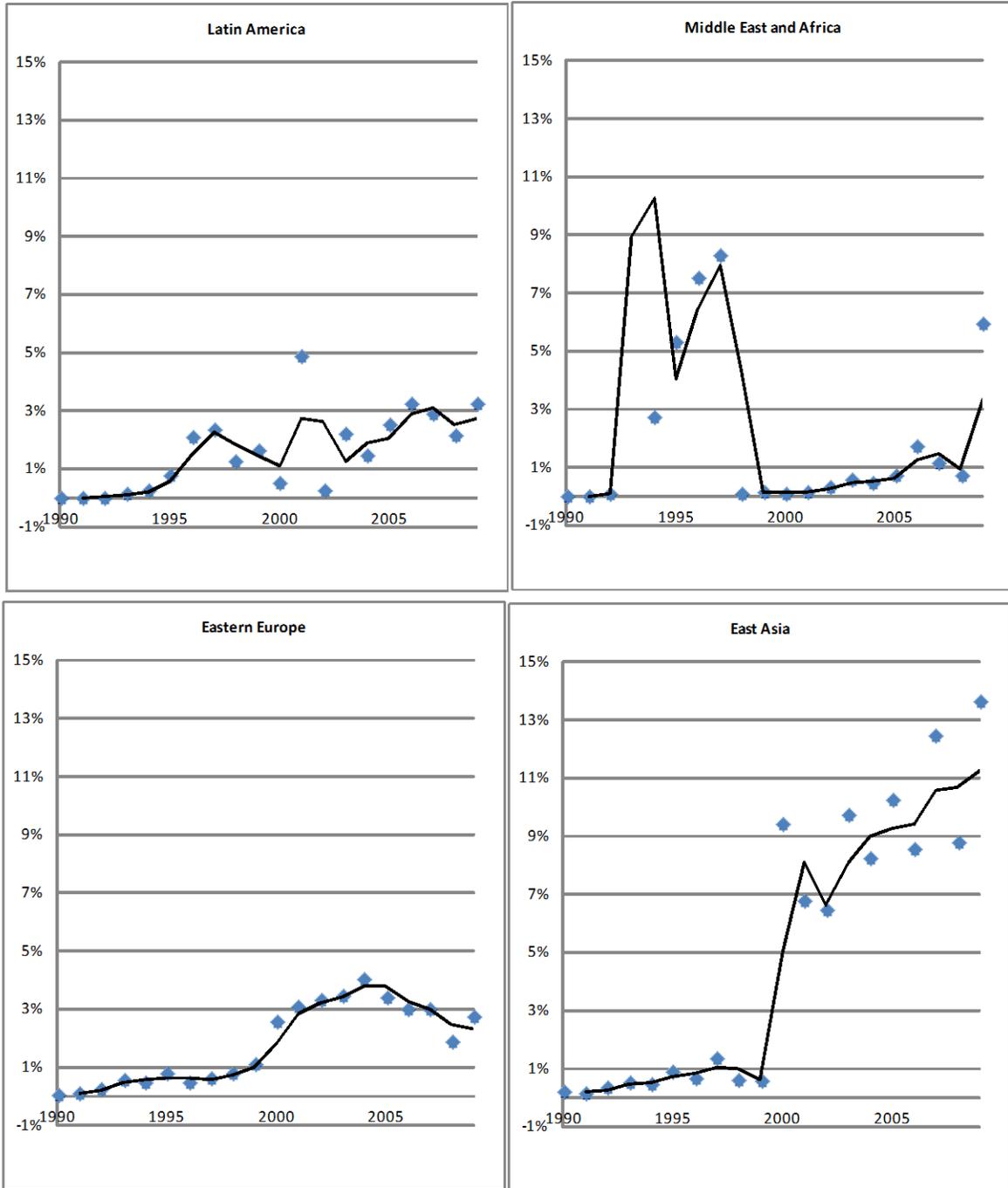
Roodman, David Malin, 2006, "How to Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata." working paper No. 103 Center for Global Development.

Samuelson, Paul A., 1994, "Facets of Balassa-Samuelson Thirty Years Later", *Review of International Economics* 2 (3): 201 – 226.

Shubik, Martin and Charles Wilson, 1977, "The Optimal Bankruptcy Rule in a Trading Economy Using Fiat Money" *Zeitschrift fur Nationalokonomie*, Vol. 37, pp.337-354.

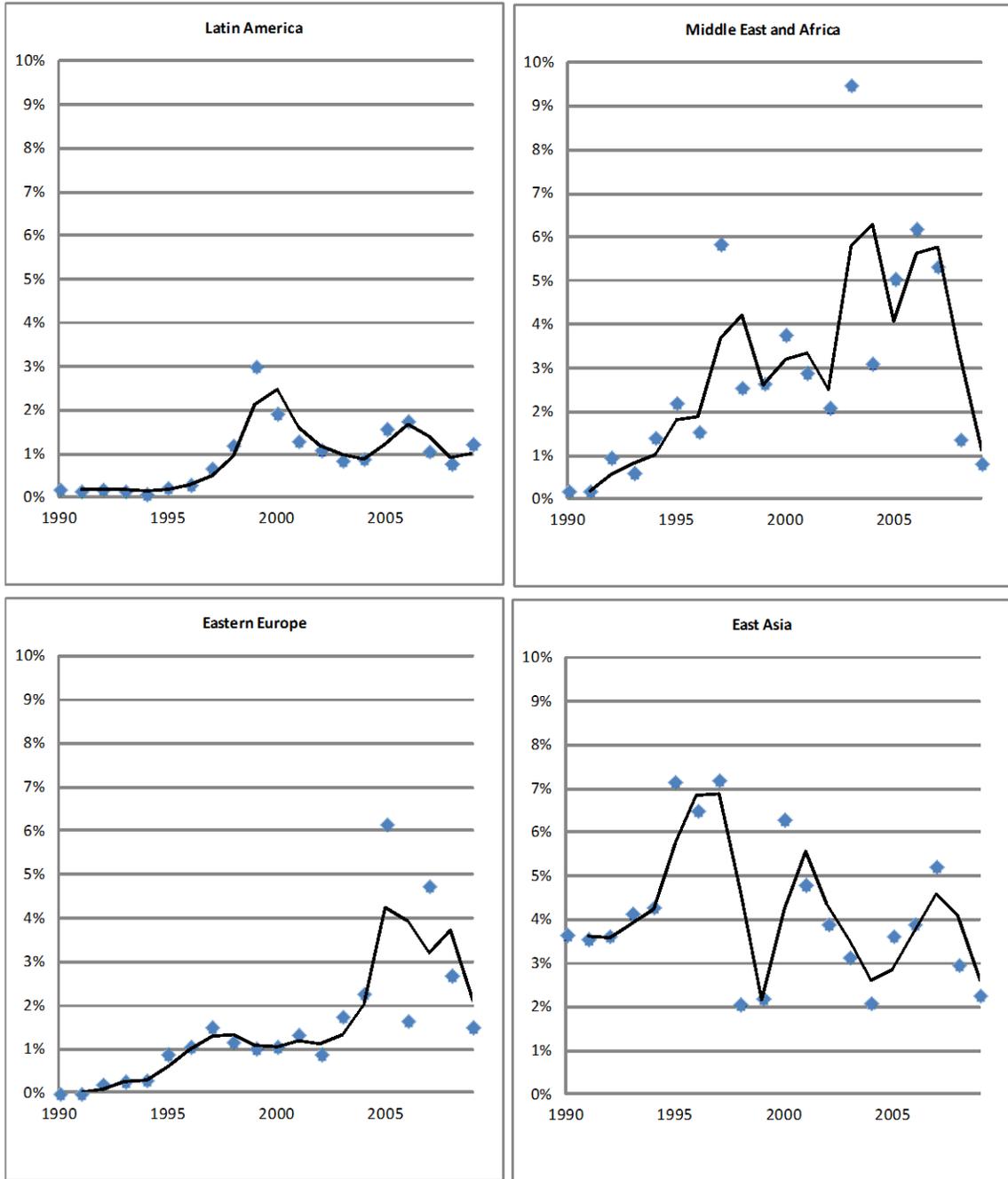
APPENDIX I. GRAPHS

Figure 1A. Bond Issuance by Region, 1990-2009
(percentage of GDP)



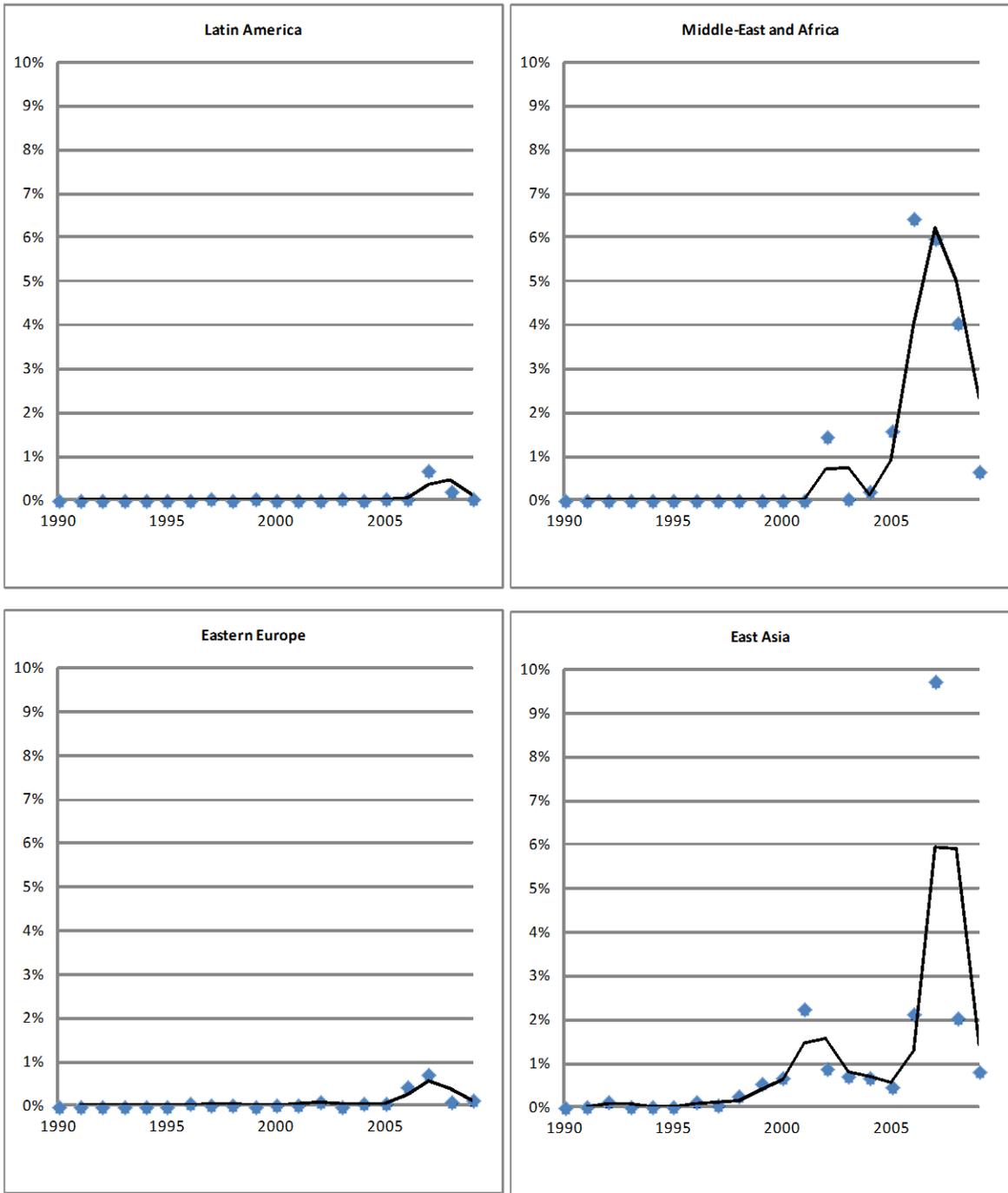
Source: Dealogic

Figure 1B. Loan Issuance by Region, 1990-2009



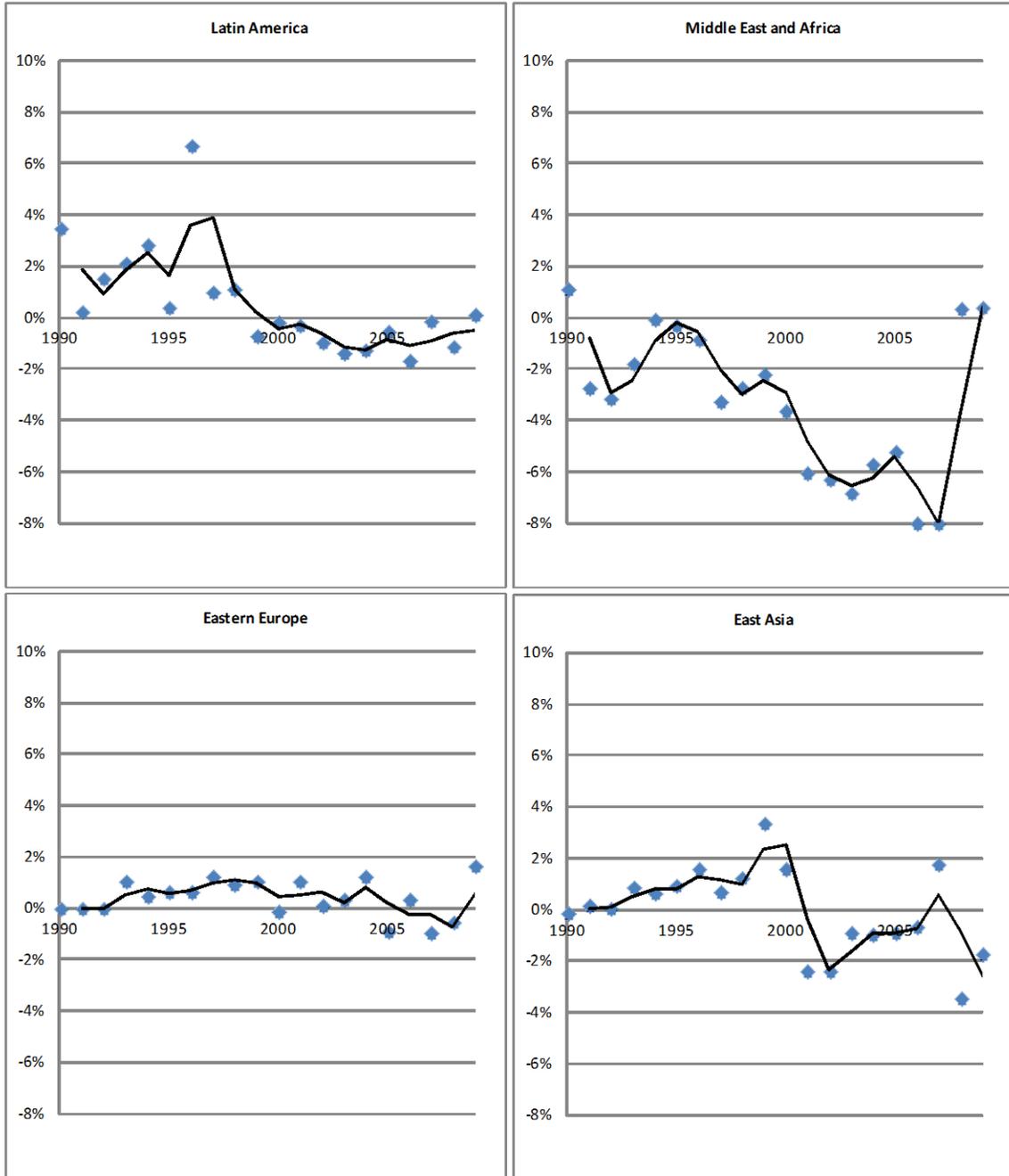
Source: Dealogic

Figure 1 C. Equity Issuance by Region, 1990-2009



Source: Dealogic

Figure 1D. Net Purchase of Foreign Financial Assets, 1990-1999



Source: Dealogic

APPENDIX II. COUNTRY CLASSIFICATIONS

This table shows the list of countries are considered, divided into four groups following the classification used by the International Monetary Fund World Economic Outlook.

Latin America	East Asia
Argentina	China, PR
Brazil	China, Hong Kong
Chile	India
Colombia	Indonesia
Mexico	Korea, Republic of
Panama	Malaysia
Peru	Philippines
Venezuela Rep.	Taiwan
	Thailand
	Vietnam

Middle East & South Africa	East Europe
Bahrain	Bulgaria
Egypt	Croatia
Israel	Czech Republic
Kazakhstan	Hungary
Kuwait	Latvia
Morocco	Lithuania
Pakistan	Poland
Saudi Arabia	Romania
South Africa	Russia Federation
Turkey	Slovak Republic
UAE	Slovenia
	Ukraine

APPENDIX III. CORRELATION MATRIX

Variable	Asset Shortage	GDP	Inflation	Real Interest Rate	Country Credit Rating	Government Deficit	GDP per Capita	Current Account	GDP Growth	Asset Bubble Index	Total Trade	World GDP	US Nominal Interest Rate
Asset Shortage Index	1.000												
GDP	0.034	1.000											
Inflation	0.035	-0.057	1.000										
Real Interest Rate	0.168	0.018	-0.285	1.000									
Country Credit Rating	-0.183	-0.207	-0.261	-0.359	1.000								
Government Deficit	-0.007	-0.159	-0.043	-0.142	0.400	1.000							
GDP per Capita	-0.096	-0.088	-0.117	-0.249	0.756	0.501	1.000						
Current Account Balance	0.010	-0.075	0.006	-0.130	0.224	0.614	0.302	1.000					
GDP Growth	-0.113	-0.027	0.255	-0.532	0.109	0.168	0.051	0.086	1.000				
Asset Bubble Index	0.003	-0.161	-0.026	0.129	0.010	0.082	0.066	0.055	-0.113	1.000			
Total Trade	-0.225	-0.532	0.064	-0.421	0.512	0.070	0.261	0.099	0.174	0.011	1.000		
World GDP	-0.270	0.189	0.159	-0.403	0.148	0.011	0.160	-0.021	0.401	0.007	0.197	1.000	
US Nominal Interest Rate	0.021	0.028	-0.021	0.168	-0.006	0.088	0.041	-0.008	-0.059	-0.082	-0.090	-0.443	1.000

Source: WDI, Dealogic, Bankscope, and IFS.

APPENDIX IV. ECONOMETRIC METHODOLOGY— SYSTEM GMM

The baseline regression of explaining the asset shortage index is the following:

$$\Delta y_{it} = \alpha y_{i,t-1} + \beta X_{it} + \gamma Z_{it} + v_i + \varepsilon_{it} \quad (1)$$

where y_{it} is the dependent variable i.e., asset shortage index; X_{it} is the set of core explanatory variables; Z_{it} the set of additional explanatory variables.

The GMM (generalized method of moments) estimates the parameters by matching the population moments with the sample moments. In particular, dynamic panel GMM estimator can be described as follows:

Firstly, rewrite Equation (1) as $y_{it} = (1 + \alpha) y_{i,t-1} + \beta X_{it} + \gamma Z_{it} + v_i + \varepsilon_{it}$. For simplicity, let us assume Z_{it} are included in X_{it} . Now it can be written $y_{it} = \lambda y_{i,t-1} + \beta X_{it} + v_i + \varepsilon_{it}$ $t=1, 2, \dots, T$. The following assumptions on the population moment are imposed:

Assumption 1 (error components): $E(v_i) = E(\varepsilon_{it}) = E(v_i \varepsilon_{it}) = 0$

Assumption 2 (serially uncorrelated error term): $E(\varepsilon_{it} \varepsilon_{is}) = 0$, for $t \neq s$

Assumption 3 (predetermined initial conditions): $E(y_{i1} \varepsilon_{it}) = E(X_{i1} \varepsilon_{it}) = 0$, for $t=2, \dots, T$

The DGMM (difference GMM) estimator uses the first-differencing transformation to eliminate the time-invariant country-fixed effects v_i .

For example: $y_{i3} - y_{i2} = \lambda(y_{i2} - y_{i1}) + \beta(X_{i2} - X_{i1}) + \varepsilon_{i3} - \varepsilon_{i2}$ for $t=3$.

Therefore, the lagged level y_{it} and X_{it} are valid IV (instrumental variables) for

$\Delta y_{i2} = (y_{i2} - y_{i1})$ and $\Delta X_{i2} = (X_{i2} - X_{i1})$, respectively because they are uncorrelated with the error terms by assumption 3, i.e., $E(y_{i1} \Delta \varepsilon_{i3}) = E(X_{i1} \Delta \varepsilon_{i2}) = 0$. Similarly, more moment conditions can be established from $E(y_{i,t-2} \Delta \varepsilon_{it})$ and $E(X_{i,t-2} \Delta \varepsilon_{it}) = 0$, $\forall t = 3, \dots, T; s \geq 2$.

The SGMM (system GMM) estimator exploits additional moment's restrictions from first difference:

Assumption 4: $E(\Delta y_{i2} v_i) = E(\Delta X_{i2} v_i) = 0$

Furthermore, assumption 4 implies the following moment conditions: $E(\Delta y_{i,s} (v_i + \varepsilon_{i,T})) = 0$ and $E(\Delta X_{i,s} (v_i + \varepsilon_{i,T})) = 0$, $s=2, \dots, T-1$. By incorporating the additional moment conditions, system GMM reduced finite sample bias compared to DGMM. (see Bond, 2002, and Roodman, 2006)

APPENDIX V. SERIES DESCRIPTION AND DATA SOURCES

This table shows the description of the data used and their sources. All variables are annual and at the country level.

<i>Series Name</i>	<i>Description</i>	<i>Source</i>
Gross domestic product (current US dollars)	Gross domestic product at current price in US dollars. GDP data is converted from domestic currencies using yearly average official exchange rates.	IMF: World Economics Outlook; World Bank: World Development Indicators
Gross domestic product per capita (current US dollars)	GDP divided by total population.	IMF: World Economics Outlook; World Bank: World Development Indicators
Gross Domestic Saving	Defined as Gross National Disposable Income subtracts Total Expenditures. Data is converted from domestic currencies using yearly average official exchange rates.	IMF: International Financial Statistics, World Economic Outlook; World Bank: World Development Indicators
Bond Issuance in Domestic (Foreign) Market	Data is converted from domestic currencies using yearly average official exchange	Dealogic
Loan Issuance in Domestic (Foreign) Market	Data is converted from domestic currencies using yearly average official exchange	Dealogic
Equity Issuance in Domestic (Foreign) Market	Data is converted from domestic currencies using yearly average official exchange	Dealogic
Short Term Deposits	Data is converted from domestic currencies using yearly average official exchange	Bankscope
Net position of Foreign holding of Domestic Assets	Foreigner's asset minus liabilities positions in domestic debt, equity, other investable assets and other investments.	IMF: Balance of Payments
Net position of Domestic holding of Foreign Assets	Domestic investor's asset minus liabilities positions in foreign debt, equity, other investable assets and other investments.	IMF: Balance of Payments

Real interest Rate	Nominal interest rate minus inflation.	World Bank: World Development Indicators
Inflation	Inflation as measured by the log annual growth rate of the gross domestic product implicit deflator. We use the CPI if the GDP-deflator is not available.	IMF: World Economics Outlook; World Bank: World Development Indicators
Fiscal deficit	The overall budget is total expenditure and lending minus repayments less current and capital revenue and official grant received; shown as percentage of GDP. Data available for central government only	Haver Analytics
Institutional Regulation	Constructed from AREAER's provisions specific to institutional investors (including: Insurance companies, Pension funds, Investment firms and collective, excluding banks). The restriction is on holding of both domestic and foreign assets. Due to data availability and changing format of the report over the period we are interested, the outcome is a binary number, 1 = restriction exist, otherwise it is 0.	IMF: Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)
World GDP	The IMF revised the reporting format for capital account restrictions in 1996, when it started to provide more details on aspects of capital account liberalization. Before 1996, the IMF measure of capital account liberalization is a simple dummy variable.	World Bank: World Development Indicators
Degree of Capital account openness (Kaopen)	Constructed base on the four binary dummy variables: 1, presence of multiple exchange rates; 2, restrictions on current account transactions; 3, restrictions on capital account transactions and 4, requirement of the surrender of export proceeds reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). These variables are to provide information on the extent and nature of the restrictions on external accounts. Higher the number means more capital account openness.	Chinn, Ito (2005)
de facto Exchange Rate	The number ranging from 1 - 6, 1 meaning de factor peg	Reinhart and Rogoff (2004)
Real Exchange Rate	Number of foreign currency per 1 domestic currency	IMF: International Financial Statistics
Institutionalized Democracy	Democracy is conceived as three elements. 1, the presence of institutions and procedures through which citizens can express effective preference about alternative policies and leaders. 2, the existence of institutionalized constraints on the exercise of power by the executive. 3, the guarantee of civil liberties to all citizens in their daily lives and in acts of political participations. The indicator is an additive eleven-point scale (0-10)	Policy IV project - University of Maryland
Trade Openness (Total Trade)	Sum of imports and exports of goods and services over GDP	IMF: Balance of Payments
Government Fiscal balance		IMF: Government Finance Statistics, Staff Report;

		Haver Analytics,
External Debt		IMF: International Financial Statistics; Staff Report
Government Debt		IMF: Government Finance Statistics, Staff Report
Government Revenue		IMF: Government Finance Statistics, Staff Report
Country Credit Rating	Short term Credit Rating for each country we are interested over 1990 - 2009	Fitch
Government Stability	ICRG political risk sub-component (12%) weight. This is a measure both of the government's ability to carry out its declared program(s), and its ability to stay in office. This will depend on the type of governance, the cohesion of the government and governing party or parties, the closeness of the next election, the government's command of the legislature, and popular approval of government policies.	Political Risk Services: International Country Risk Guide.
Economic risk rating	The value of the Political Risk Service (PRS) Group's economic risk indicator (which ranges between 0 and 50). The risk rating is a combination of 5 subcomponents: GDP levels and growth, respectively, inflation, balanced budgets, and the current account. The minimum number of points for each component is zero, while the maximum number of points depends on the fixed weight that component is given in the overall economic risk assessment.	Political Risk Services: International Country Risk Guide.
Corruption	ICRG political risk sub-component (6%) weight. This is a measure of corruption within the political system. Such corruption: distorts the economic and financial environment, reduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introduces an inherent instability into the political process. The most common form of corruption met directly by business is financial corruption in the form of demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans. Although the PRS measure takes such corruption into account, it is more concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, "favor-for-favors," secret party funding, and suspiciously close ties between politics and business. In PRS's view these sort of corruption pose risk to foreign business, potentially leading to popular discontent, unrealistic and inefficient controls on the state economy, and encourage the development of the black market.	Political Risk Services: International Country Risk Guide.
Law and Order	ICRG political risk sub-component (6%) weight. PRS assess Law and Order separately, with each sub-component comprising zero to three points. The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law. Thus, a country can	Political Risk Services: International Country Risk Guide.

	enjoy a high rating (3.0) in terms of its judicial system, but a low rating (1.0) if the law is ignored for a political aim.	
Risk for Inflation	Ranging from high % of 130+ with risk points at 0.0, to a low of 0.0 with 10.0 points. The higher the points, the lower the risk. (Refer to ICRG Methodology for maximum points for this variable, as well as for related formulas for calculating risk.)	Political Risk Services: International Country Risk Guide.
Business Freedom	Business Freedom is a quantitative measure of the ability to start, operate, and close a business that represents the overall burden of regulation, as well as the efficiency of government in the regulatory process. The business freedom score for each country is a number between 0 and 100, with 100 equaling the freest business environment. The Score is based on 10 factors, using data from the World Bank's Doing Business study.	The Heritage Foundation
Financial Freedom	Financial freedom is a measure of banking security as well as a measure of independence from government control. State ownership of banks and other financial institutions is an inefficient burden that reduces competition and generally lowers the level of available services. It has scale between 0 to 100, 100 means negligible government influence.	The Heritage Foundation
Property Rights	Property rights component is an assessment of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state. It measures the degree to which a country's law protect private property rights and the degree to which its government enforces those laws. It also assesses the likelihood that private property will be expropriated and analyzes the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. It has scale between 0 and 100, 100 means Private property is guaranteed by the government,	The Heritage Foundation