Building Bond Markets in Latin America
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1. Introduction

Strengthening financial markets has long been a prominent element of the reform agenda in Latin America and the Caribbean. What is new is the emphasis on developing local bond markets. Since the early 1990s, Latin American countries have relied on international bond markets for access to foreign funds, while for domestic financial intermediation countries and in particular their private sectors have relied on bank intermediation. These strategies have drawbacks. Investors in international markets have a preference for bonds denominated in the major international currencies, such as U.S. dollars, rendering borrowers vulnerable to currency mismatches and to disruptions in the event that exchange rates change.[1] Excessive dependence on bank intermediation, for its part, heightens the vulnerability of the economy to systematic banking crises. These are just examples of the arguments invoked for why Latin American countries would benefit from better diversified financial systems and, specifically, deep and liquid bond markets.

Yet the development of a well-functioning bond market presupposes extensive infrastructure, including well-developed accounting, legal and regulatory systems, payments and settlements systems, rating agencies, and networks of brokers to sell bonds. It requires rigorous disclosure standards and effective governance of corporations issuing publicly-traded debt securities. It presumes the existence of well-established companies whose operations and credit standing are well known and that are large enough to defray the non-negligible fixed costs of placing a bond issue. These are not preconditions that develop overnight. Rather, they are by-products of the larger process of economic and financial development, which is why even in the advanced countries bond markets historically have been late to develop. So long as some of these developmental preconditions remain absent, borrowers may prefer to tap the more extensive and efficient bond-market infrastructure that exists in the major financial centers. Or they may find it easier to borrow from banks, which rely on long-term relationships with their clients to obtain information and enforce repayment, thereby enabling them to circumvent imperfections in the information and contracting environments.

Predictably, bond market development in Latin America presents something of a mixed picture. On the one hand, there has been extensive reform and, as a result, growth in the size and liquidity of local bond markets. Governments have implemented improvements in market infrastructure, including regulation. They have privatized utilities and other public enterprises, expanding the population of large enterprises that potentially satisfy the preconditions for accessing bond markets. They have reformed pension systems, creating a natural constituency of investors in long-term, local currency bonds. They have enhanced macroeconomic and financial stability, limiting the aggregate volatility that has traditionally deterred investment in long-term, local currency debt securities. The result has been rapid growth of local bond market capitalization since the mid-1990s and especially in the last five years. These developments have found

[1] See Goldstein and Turner (2004). There has been some modest progress recently in placing on those markets bonds denominated in Latin American currencies, but not enough to change this fundamental fact. See BIS (2005).

reflection in growing interest and participation in the local markets of Latin American and Caribbean countries by institutional and individual investors from outside the region.

At the same time, Latin American bond markets continue to lag along a number of dimensions, not just when compared with the advanced industrial countries but even when assessed relative to the emerging economies of Asia, which are similarly seeking to develop local bond markets.[2] The duration of issues on Latin American markets remains relatively short. The region has made some progress here, but in terms of, say, the share of bonds with a residual maturity of less than one year it still compares unfavorably with Emerging East Asia, much less with the advanced economies. (See Figure 1.) The majority of issues on Latin American markets have floating rates, and investors demand that interest rates be indexed to inflation or the exchange rate, in contrast to Emerging Asia where fixed rates are the norm and indexation is virtually nonexistent. About 80 per cent of all bonds issued in East Asia between 2000 and 2005 (weighted by value) had a maturity above year and no indexation, whereas the comparable figure for Latin America was less than 10 per cent.[3] (See Figure 2.) With the exception of a few benchmark issues, turnover rates remain relatively low, leaving markets relatively illiquid. And regional markets are still disproportionately dominated by government bonds. Public sector bonds comprise 30.0 per cent of regional GDP, compared to a more modest 23.3 per cent in Emerging Asia, reflecting the more extensive government borrowing that has traditionally been characteristic of Latin America.[4] In contrast, the corporate side of domestic markets remains particularly underdeveloped: in Latin America domestic corporate bonds amount to only 2.7 per cent of regional GDP, compared to 8.9 per cent in East Asia.[5]

The question is whether these contrasts are likely to be short-lived or enduring. If the problem in Latin America is that years of budget deficits have led to excessive government bond issuance that has crowded out private bond issuance, then many years of primary fiscal surpluses may have to pass before the "overhang" of government bonds is worked down. If the problem is that Latin America's history of macroeconomic and financial instability limits investors' demands to debt securities with interest rates indexed to inflation or the exchange rate, then many years may have to pass before

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[2] Asian efforts revolve around the Asian Bond Fund (ABF) and Asian Bond Market Initiative (ABMI). Launched by the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) in June 2003, the ABF is designed to catalyze the growth of Asian bond markets by allocating a portion of the reserves of regional central banks to purchases of government and quasi-government securities. The initial $1 billion of investments, known as ABF-I, was devoted exclusively to Asian sovereign and quasi-sovereign issues of dollar-denominated bonds. ABF-II is twice as large and includes bonds denominated in regional currencies. It has two components: a $1 billion central bank reserve pool to be overseen by professional managers for local bond allocation, and a $1 billion index unit designed to list on eight stock exchanges beginning with Hong Kong in 2005. The latter is designed to facilitate one-stop entry for retail and institutional buyers as well as providing a benchmark structure for tracking pan-Asian performance. The AMBI, endorsed by ASEAN+3 finance ministers at their meeting in Manila in August 2003, is designed to foster an active and liquid secondary market in local-currency bonds and to develop the infrastructure needed for the growth of local bond markets, mainly through the activity of six working groups and a focal group intended to coordinate their activities.

[3] Comparable figures for corporate bonds are essentially identical.

[4] These are weighted averages of national data for 2004. Simple averages are 31.3 and 27.6 per cent, respectively.

[5] Again these are weighted averages of national data for 2004. Simple averages are 4.8 and 11.8 per cent, respectively.

stronger policies making for reduced volatility to produce a demand for longer-term issues. If perceptions of imperfect corporate governance and unreliable contract enforcement currently render investors reluctant to hold corporate bonds at any price, then some time may have to pass before the relevant reforms begin to create a significant demand. If in smaller Latin American and Caribbean countries the local market's lack of scale is the obstacle to spreading the fixed cost of an issue and enhancing secondary-market liquidity, then reasonable questions can be raised about whether this obstacle can ever be overcome. Or maybe these qualms are overstated; maybe the relevant reforms will succeed in producing deeper and more liquid bond markets in short order. In sum, the question is: how long will it take for Latin America and the Caribbean to develop deep and liquid bond markets?

2. The State of the Markets

As noted above, even in the advanced industrial countries, bond markets in general and corporate bond markets in particular have been relatively late to develop, reflecting the existence of substantial institutional prerequisites. Although governments seeking to borrow to meet their fiscal needs were able to place government bonds with domestic investors, albeit sometimes, notably in the Latin American case, only bonds of very short maturity indexed to the exchange rate or denominated in foreign currency, the situation facing corporations was different. Prior to the 1980s corporate bond markets were essentially nonexistent outside the United States (IMF 2005a). U.S. exceptionalism reflected the restrictions placed on the banking industry (the separation of commercial and investment banking, restrictions on interstate branching, etc.), together with the creation of a relatively robust regulatory environment and a bankruptcy code that facilitated reorganization and thus encouraged firms to rely on debt finance.[6] The U.S. corporate bond market then expanded further in the 1980s with the relaxation of regulatory restrictions and improvements in the information environment encouraging securitization, which facilitated the creation of the junk bond market, and then in the 1990s with the strong economic expansion encouraging corporate debt issuance. In Japan, the bond market grew rapidly from the second half of the 1980s as a restrictive regulatory environment gave way to widespread liberalization, in turn precipitating institutional innovation (the start of bond futures trading, the establishment of rating agencies, etc.). The Big Bang reforms of the mid 1990s, which eliminated the securities transactions tax, deregulated brokerage commissions, and introduced a legal framework for securitization, then facilitated further growth even in the face of a stagnant economy (IMF 2002). In Europe, corporate bond markets remained small, reflecting the continent's traditional dependence on bank finance.[7] This bean changing with the advent of the Single Market, which intensified competition in the financial sector, compressing underwriting fees, and especially following the advent of the euro in 1999, suggesting that exchange rate risk and problems associated with the small scale of national markets may have played a role (Eichengreen 2000, Nierop 2006).

The story is similar but even more dramatic in Latin America – and in emerging markets generally. Prior to the 1990s there were essentially no local corporate bond

[6] See Bolton (2003).

[7] Germany is a partial exception, where a reasonably deep and liquid bond market has coexisted with a well-developed banking system.

markets in Latin America, although local issuance and investment in government bonds were extensive. At that point macroeconomic stabilization and the adoption of strengthened securities market and corporate governance regulations ignited the takeoff of local markets. The period since the middle of the 1990s has seen rapid growth in local bond markets a number of Latin American countries. Figure 3 shows the growth of the bond market in the decade ending in 2004, where market capitalization is scaled by GDP. Chile, where the process began somewhat earlier, has seen domestic market capitalization grow right in line with the economy, while Peru, Colombia, Mexico and above all Brazil, where there was more scope for catch-up, have seen the bond market grow even faster than the output of goods and services. Figures 4 and 5 show, however, that this exceptional growth, especially in Brazil, has been due mainly to the rapid expansion of the stock of government bonds, reflecting prevalent budget deficits until recent years and the use by governments of bond finance. The one exception again is Chile, where the market in public bonds has grown more slowly than GDP while that in corporate bonds has grown more quickly.

On balance, Latin America continues to lag behind not just the advanced countries but also Emerging East Asia when bond markets are measured relative to GDP. While Latin America has a larger stock of government bonds, so measured, as of 2004, reflecting the region's history of budget deficits, the segments of the bond market accounted for by the issues of financial institutions and corporations is noticeably smaller than in East Asia (Figure 6). Interestingly, this differential in the growth of local markets is less pronounced when capitalization is scaled by the size of the financial sector (by M2 or, even more clearly, by the stock of domestic credit, see Figures 7 and 8).[8] Another way of putting the fact that Latin American bond markets are small relative to GDP but not relative to the financial sector is that it is Latin American financial sectors and not merely the bond market that is underdeveloped.

The fact that these markets seem to grow together suggests that bond market development is a corollary of the larger process of financial development. This hypothesis is consistent with the notion that the development of banking systems and the development of bond markets have a number of prerequisites in common. In both cases, public confidence requires a reasonable level of information disclosure. In turn, mandating such disclosure and solving "lemons problems" may require regulation by a supervisory agency or securities commission. The development of both a bond market and a sound banking system will require strong creditor rights and an effective system of corporate governance, so that small creditors can be assured of being dealt with fairly. In both cases, confidence among depositors and investors may require macroeconomic stability so that depositors and investors do not fear that the value of their claims will be inflated away, and strong creditor rights so that they are confident that they will get a square deal in the event of a debt crisis or a banking crisis.

In addition, the fact that bond markets grow in tandem with the rest of the financial system, which means in practice with the banking system, suggests that banks and bond markets are complements rather than substitutes. Banks provide underwriting services for prospective domestic issuers, advising the issuer on the terms and timing of the offer. They provide bridge finance in the period when the marketing of bonds is still

[8] In fact, when we scale the bond market by the size of domestic credit and use weighted averages we find that in 2004 Latin America was the region with the largest bond market.

underway. They provide distribution channels for government bonds and form an important part of the primary dealer network. Their institutional support may also be conducive to secondary-market liquidity. Finally, and most directly, banks owing to their relatively large size can be major issuers of domestic bonds themselves.[9] While some of these services can be purchased from foreign banks, the costs of doing so can be substantial. And for some functions, as with the provision of a distribution network to local retain investors, foreign banks may lack the relevant institutional capacity. All this suggests that bond market development should not be seen as an alternative to the development of an efficient banking system but rather as part of a single organic process. Conversely, there is the fear not just that an inefficient banking system may hinder bond market development but also that an imperfectly competitive system, in which the banks have significant market power, may allow them to use their incumbency advantage to hinder the advance of securitization and disintermediation by slowing the growth of the bond market.[10] In Chile, the Latin American country with the most active corporate bond market, fully 26 investment banks have been active in underwriting and helping to place domestic debt securities.[11] Brazil has 20 different commercial and investment banks that act as lead underwriters.[12] Mexico is a counterexample; there three large banks have dominated the underwriting and sell side of the domestic market.[13]

This perspective is rather different from the "pecking order model" in which bank finance develops first, because the information and contracting environments are highly imperfect. According to this model, banks in long-term relationships with their clients have a comparative advantage in bridging information gaps, enforcing repayment and reorganizing problem loans. Bond markets only develop later, once an economy has acquired strong institutions of information disclosure, corporate governance, insolvency reorganization, and so forth. Recent research (e.g. Rajan and Zingales 2001b) suggests that the actual sequencing of external finance, starting with banks and moving from bond markets and finally equity markets, in actual fact is not so clear cut. The precise form of this sequencing differs in different times and places. While not denying the special role of banks in the kind of imperfect information and contracting environment that is characteristic of many emerging markets, the perspective here suggests that the development of banking systems does not just precede the development of bond markets; rather, the two are complementary processes.

Another approach to uncovering the constraints on the development of local bond markets, in addition to broad inter-regional comparisons, is by conducting detailed studies of national cases and uncovering variation within the region. Figure 9 suggests that it is important to also take this approach, given the wide variation that exists in the development of bond markets. It shows, for example, that bond markets in Brazil and Chile are an order of magnitude larger than those of Argentina and Peru, even scaled by

[9] Although in practice this seems to be more the case in the advanced economies and in East Asia than in Latin America – see below. In addition, banks in many countries hold a large share of short-term government debt to meet statutory liquidity requirements.

[10] This they may do by limiting access to the payment system and by supporting the maintenance of regulations that increase the cost of underwriting and issuance (Schinasi and Smith 1998, Rajan and Zingales 2003a, Eichengreen and Leungnareumitchai 2004).

[11] See the chapter on Chile by Braun and Briones (this volume).

[12] Leal and Varvalhal-da-Silva (this volume), p.19.

[13] As discussed in the chapter by Martinez et al. (this volume).

GDP. This variation is, if anything, even more characteristic of the market in bonds placed by private issuers (corporations and financial institutions), the market segment of particular concern to many policy makers. Thus, we see that while Brazil and Chile have the two best capitalized bond markets in the region, those markets are very different in composition: in Brazil corporate bonds are almost nonexistent, while in Chile they represent a significant share of market capitalization. Chile is also the one Latin American country where there exist credit derivatives. Pension funds can therefore buy corporate bonds with various ratings and sell the credit risk to international insurance companies, so that, consistent with their mandates, they end up holding only the interest rate risk, not the credit risk.

This variation is equally apparent in other dimensions of bond market development, including the maturity of corporate bond issues (Figure 10) and turnover rates for both public and private bonds (Figure 11). On average, turnover appears to be higher in Latin America than in East Asia, partly because of the extraordinarily high recorded turnover rates for Mexico.[14]

The studies commissioned for this project suggest that these intra-regional variations have multiple causes. In some countries the problem is the small size of the economy, which makes it difficult to develop secondary-liquidity, and the small size of potential corporate issuers, who may not be able to spread the fixed costs of placement over an adequately-sized bond placement. We can see this in Figures 13-15, which show that larger countries have better capitalized bond markets, and that this relationship is evident for the total, government and corporate segments of the market alike. Some of the country studies commissioned for this project highlight that, given large fixed costs, firms are very unlikely to use bonds. As Figures 16 and 17 show, there is a positive correlation between adjusted firm size and the size of the corporate bond market.[15] This correlation is particularly strong when we measure corporate bonds as a share of M2, indicating that given the size of the financial system countries with larger firms are more likely to develop a corporate bond market. Note, however, that there are several Asian countries, such as Korea, with a corporate bond market which is much larger than what would be predicted by firm size.[16]

In some countries the problem is relatively low savings rates and their implications for developing an adequate investor base. In Asia, high savings rates create a considerable pool of funds for investment in locally-issued bonds; a classic case in point is Japan, where a significant savings surplus has kept spreads narrow, resulting in the dominance of domestic investors in the bond market.[17] In Latin America, by comparison, savings rates are lower. Figures 18 and 19 – especially Figure 18 for total

[14] Our estimates of turnover are computed from quarterly surveys conducted by EMTA and could conceivably reflect reporting bias (reporting EMTA members could be disproportionately active in Mexican markets). Figure 12 confirms that responding EMTA members trade more Latin American paper than East Asian paper but that when trading Asian paper they trade a much larger share of locally-issued instruments.

[15] To measure firm size, we compute the assets of the largest 100 firms as a share of GDP and regress this on GDP (as a way of acknowledging the fact that, by construction, this ratio is negatively correlated with country size). We use the residual of this regression as our measure of adjusted firm size.

[16] We analyze comparative bond market development in Latin America and East Asia in a companion paper (Eichengreen, Borensztein and Panizza 2006).

[17] Ma, Remolona and Jianxiong (2006), p.4.

saving – suggest that this is at least one factor contributing to differential bond market development.[18] This makes it all the more important to promote the development of institutional investors – pension funds, mutual funds, insurance companies and banks – with a particular appetite for bonded debt who are therefore inclined to channel the available savings toward the bond market. Banks demand government bonds in order to satisfy prudential requirements. Pension funds and insurance companies have long-term liabilities in domestic currency; it therefore makes sense for them to match these with long-term domestic-currency investments. Mutual funds, for their part, enable individual investors to diversify away the idiosyncratic risk associated with individual bonds by holding claims on a broad underlying investment portfolio. In cross-country regressions, we find that the number of years since a country privatized its pension system has a strongly positive impact on the capitalization of its bond markets.[19]

The importance of these institutional investors is not limited to Latin America; pension funds and provident funds play a prominent role in local bond markets in East Asia as well. We can see this in Figures 20 and 21, where the role of these institutional investors in the two regions is compared. These figures show a positive correlation between assets of pension funds and institutional investors (defined as pension funds plus insurance companies) and the size of the corporate bond market.[20] But Latin America's low savings rates arguably render institutional investors even more indispensable to the development of local bond markets in the region. Pension funds hold a very significant fraction of government bonds in countries like Chile, Colombia, and Mexico, where the reform of pension systems was relatively early to get underway. In Brazil, the mutual fund industry is the most important holder of government securities (along with the banking system and the state development bank, BNDES), although it focuses mainly on the short end of the market. The role of life and other insurance companies is smaller in Latin America than in Asia – with the notable exception of Chile, where insurance company assets under management approach 20 per cent of GDP. In Mexico and Chile, institutional investors hold upward of 90 per cent of corporate bonds; in Peru they hold more than 70 per cent.[21] In Asian countries with higher savings rates – in Thailand for example – retail investors who purchase bonds directly through bank branches play a larger role in the local bond market.

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[18] The fact that this relationship is stronger for total saving than private saving is another hint that chronic government budget deficits (public dissaving, in other words) is not especially good for bond market development, the advantages of public issuance for the creation of a liquid benchmark asset notwithstanding.

[19] These exercises use BIS data and partial out the effect of pension privatization using a variety of controls. We find that the effect of years since pension privatization is stronger on the capitalization of government bond markets than corporate bond markets, however, perhaps because pension funds often operate subject to restrictive mandates that limit their ability to hold speculative credits (see below).

[20] They also show that Latin American countries have smaller markets than predicted by the assets under management by institutional investors – that is, they tend to be below the regression line. A possible interpretation is that other (non-institutional) investors are even less important in Latin America than East Asia. The data for Asia are from Table 3.2 in Dalla (2003), data for holding of pension funds in Latin America are from the website of the International Federation of Pension Fund Administrators (www.fiap.cl) and data on assets of insurance companies are from the website of the Latin American Association of Insurance Supervisors (www.asslaweb.org).

[21] See IMF (2005a).

Latin American governments have taken a variety of steps to encourage the participation of institutional investors. Chile has relaxed limits on the investment portfolios of insurance companies, raised the limits on individual voluntary contributions to pension funds, and standardized capital requirements for mutual funds.[22] It has put in place detailed list of safeguards and procedures to facilitate the investment of pension funds in corporate bonds: bonds first must be reviewed by the securities commission, accepted for listing by the stock exchange, and in the case of corporate bonds approved by the Risk Classification Commission.[23] Companies issuing bonds must be registered with the supervisory authority and fulfill demanding disclosure requirements, mainly by submitting detailed balance sheets quarterly. Mexico reformed its Mutual Funds Act in 2001 to facilitate the development of additional collective investment vehicles. Rules governing the portfolio allocation decisions of pension funds were relaxed (although these funds are still prohibited from taking positions in sub-investment-grade bonds).[24] Peru is seeking to relax regulations limiting pension fund investments in corporate bonds. Brazil's new bankruptcy law, designed to speed reorganization and strengthen creditor rights, should work in the same direction.

But relying on institutional investors for the demand for locally-issued bonds also has costs. Pension funds and insurance companies follow a buy-and-hold strategy.[25] Liquidity, at least as measured by turnover, tends to be less in markets dominated by a few large institutional investors. Less liquidity makes participation even less attractive for retail investors. And the lower levels of demand that result raise required rates of return and placement costs for issuers. These are not easy nuts to crack, but higher savings rates may be an important part of the solution.

The other way of enhancing market liquidity is by encouraging foreign participation in local markets.[26] This can be done, first and foremost, by eliminating capital controls impeding foreign participation and relaxing or eliminating withholding

[22] See the chapter by Braun and Briones on Chile.

[23] A byproduct of these prudential regulations which may limit the participation of the pension funds and insurance companies in the domestic corporate bond market is that such funds and companies are precluded from holding bonds rated below BBB. In turn, this limits the demand for the bonds of smaller and riskier firms. However, institutional investors in Chile are able to circumvent this constraint to some extent by utilizing the market for credit derivatives – see above. However, it is also argued that competition between the three mandatory pension funds is not particularly intense; hence they have relatively little incentive to compete for yield by purchasing higher-yielding instruments and utilizing costly credit derivatives. Again, see the chapter by Braun and Briones. This constraint binds even more tightly in countries like Colombia where there do not exist credit derivatives. There the six mandatory pension funds are allowed to invest only in corporate bonds with investment-grade ratings, which is a large part of the explanation for why firms only issue bonds if they are investment grade.

[24] For details, see Martinez, Castellanos and Gonzalez (this volume).

[25] IMF (2002) notes that institutional investors – insurance companies in particular – have an incentive to trade more actively to raise the yield on their investment portfolios, especially in periods when interest rates are low.

[26] The discussion here focuses on foreign purchases of local issues by residents. The other way of involving nonresidents is by encouraging them to issue domestically. Some emerging Asian countries have gone a considerable way down this road. Thus, as of the end of 2004 issues by nonresidents accounted for 56 per cent of corporate bond issuance in Hong Kong (admittedly, a special case), 36 per cent in Singapore, and 13 per cent in the Philippines. See Gyntelberg, Ma and Remolona (2006). In Latin America this practice is still all but nonexistent aside from a few local issues by the IADB.

taxes on interest payments that foreign investors regard as particularly onerous.[27] Figures 22 and 23 show the role of resident and nonresident issuers of bonds in the currencies of 21 emerging market countries. While in most cases the local currency market is completely dominated by residents, non-residents play an important role in Hong Kong, South Africa, Singapore and Czech Republic. Overall 99 per cent of bonds issued in Latin American currencies are issued by residents, and 92 per cent of bonds issued in East Asian currencies are issued by residents.[28]

Participation by investors from outside the region appears to be particularly important for the development of deep and active bond markets in Latin America.[29] However, foreign investors are most inclined to take positions in countries with larger bond markets, Brazil for example, where the costs of closing out positions are least – that is to say, where liquidity is already the greatest. The Brazilian authorities have sought to capitalize on this interest by retiring foreign debt from the market and replacing it with domestic-currency (interest-rate- and inflation-indexed) issues. Mexico, where foreign participants are reported to hold more than 50 per cent of the government's 10 year bonds and more than 80 per cent of its 20 year bonds, has sought to take advantage of foreign participation by issuing exclusively on the domestic market.[30] To be sure, there is also a foreign demand for "exotics," or the less liquid bonds of smaller countries (Figure 24 shows that, after the U.S., the bond markets with the largest foreign participation are those of Uruguay, Hungary, and Poland).[31] But this phenomenon is quantitatively limited; for most investors, the limited liquidity of exotics, together with the lack of hedging instruments and the fixed costs of obtaining information about issue quality, currency risk, withholding tax regimes, etc. in smaller markets, limits foreign demand. Foreign investors prefer the bonds of larger countries and of their governments in particular, since it is these government bonds that already display the most liquidity.

This raises the possibility that the globalization of bond markets, and the growing participation of foreign investors in Latin America's local markets in particular, may be encouraging a bifurcation between the region's larger and smaller markets, by further enhancing the already greater liquidity of the larger markets while having little discernible impact on their smaller counterparts (with the few exceptions noted above). Similarly, it may be enhancing the liquidity of government bond markets relative to corporate bond markets. This may encourage smaller countries in the region to borrow by issuing global bonds in extra-regional financial centers as an alternative to developing their domestic markets. But that in turn may further limit the development and liquidity of local markets and further discourage foreign participation.[32]

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[27] Thus, the Brazilian authorities moved in February 2006 to reduce taxes on foreign investment in local government bonds – though not yet also on corporate issues.

[28] Note that the figure for East Asia does not include China. In constructing these estimates we follow the practice of Burger and Warnock (2003) and Claessens et al. (2004) in assuming that all domestic issuers are residents and that all domestic issuances are in local currency.

[29] Data on foreign investors' positions in local markets are incomplete. Among other things, foreign investors participate through total return swaps, where the bonds themselves are registered with local banks. See IMF (2002).

[30] These estimates of foreign participation are from IMF (2005a), p.113.

[31] The data for Asia are from Takeuchi (2005), while those for other countries are from the IMF.

[32] The literature on whether foreign listing of equity claims discourages domestic trading of the same stocks points in this direction. Again, we explore this further in our companion paper (Eichengreen, Borensztein and Panizza 2006).

On the other hand, one can argue that international issues are useful for familiarizing foreign investors with a country's situation and its debt instruments and that domestic and international issues are complements rather than substitutes. Or one can argue that the two influences coexist. For what they are worth, the available data, in Figure 25, do not indicate any clear correlation between the share of bonds issued in international markets and foreign investor penetration in the domestic market (there seems to be a positive correlation for European countries but we only have 3 observations).

The most popular class of explanations for cross-country variations in bond market development, already alluded to above, is surely the state of market infrastructure (the reliability of custodial services, the efficiency of payment and settlement systems), legal infrastructure (speed of judicial proceedings, efficiency of national bankruptcy and insolvency procedures), and the effectiveness of information disclosure and corporate government requirements (which are in turn functions of the effectiveness of regulation). Of Brazil, it is said, the slow pace and unpredictable result of judicial proceedings renders investors reluctant to hold private debt securities, whereas in Chile the efficiency of the judicial system is sometimes invoked as an explanation for the development of the private bond market. More broadly, there are wide variations in these measures of legal infrastructure both within Latin America and between Latin America and other regions (Figures 26 and 27). The figures show that Latin America tends to fare poorly in terms of both investor and creditor protection. In both cases, the highest ranked Latin American country (Chile) has values which are lower than the Asian average.

Similar arguments are made regarding the development of new financial instruments enabling firms and financial institutions to securitize their receivables and other assets and allowing them to access bond markets more easily. In some countries the government and leading financial institutions have more aggressively promoted the development of these instruments and markets, for example by using regulation to encourage issuers and investors to focus on standard formats. In Brazil the development of mortgage-backed securities ("certificado de recebiveis imobilarios," or CRIs) and receivables investment funds ("fundos de investimentos em diretos creditorios, or FIDCs), with impetus from the central bank and the securities and exchange commission, was a significant step in widening the market.[33] Uruguay has similarly sought to facilitate the issuance of securitized debt instruments backed by receivables or other assets through provisions included in its Law of Trust Funds approved in 2003.[34]

The problem is that the development of the relevant legal and economic infrastructure is to some extent endogenous. That is to say, countries that develop relatively liquid deep and liquid bond markets for other reasons have an incentive to invest in the relevant legal and market infrastructure and to develop innovative debt instruments. One can register the same objection to statements to the effect that the low liquidity of the secondary market makes holding some assets unattractive.[35] Market liquidity will be enhanced by other initiatives that make investing in corporate bonds

[33] That these instruments received preferential treatment under the Brazilian tax code and bankruptcy law seems to have been a major factor in their development. See the chapter by Leal and Carvalhal-da-Silva (this volume).
[34] See Brun, Gandelman, Kamil and Porzecanski (this volume), p.4.
[35] As in the survey returns for Colombia reported by Cardenas, Melendez and Salazar (this volume).

more attractive. This suggests, at a minimum, controlling for those other, multiple determinants of bond market development when making comparative statements.

3. Previous Literature

The literature on the determinants of these patterns is quite small. We know of only two studies examining empirically the determinants of overall local bond market capitalization in a broad cross-section of countries: Eichengreen and Leungnareumitchai (2004) and Braun and Briones (2006). Eichengreen and Leungnaruemitchai (2004) use panel methods and BIS data to study the determinants of capitalization in 41 countries in the period 1990-2001. They find that the development of bond markets, so measured, has multiple determinants, a number of which have important implications for Latin America. The authors find that larger countries have better capitalized bond markets, where capitalization is measured relative to GDP. They argue that these scale effects reflect the fixed costs of creating the relevant bond-market infrastructure, including clearing and settlement systems and a reliable legal framework for issuing and trading, and that scale may also be important for the liquidity of secondary markets.

Eichengreen and Leungnareumitchai also find that countries with more competitive, better-capitalized banking systems have larger markets, as if bond and bank intermediation are complements rather than substitutes – consistent with the observations of the previous section. They find that institutional quality (low levels of corruption, adherence to internationally-recognized accounting standards) is important for the development of bond markets, private markets in particular.[36] Stable exchange rates appear to be conducive to the existence of larger bond markets, presumably by lowering currency risk and encouraging foreign participation; so too is the absence of capital controls. Finally, while a history of budget deficits results in a larger outstanding stock of government debt, which in itself is not surprising, the authors find little evidence that this affects the corporate segment of the market one way or the other.[37] Large amounts of government bond issuance seem to have cross-cutting implications for the development of the private bond market – on the one hand, a large government bond market makes for a benchmark asset or yield curve off of which other credits can be conveniently priced, while on the other large amounts of government bond issuance may crowd private bonds out of investors' portfolios – that on balance cancel out.

Braun and Briones (2006) adopt a similar approach except that they analyze the BIS data at only one point in time: the end of 2004. Their strongest result is that bond market development increases with GDP per capita as a measure of general economic development. A recent history of budget deficits is associated with a larger domestic debt stock overall due to its impact on the outstanding stock of government debt; once more, however, fiscal policy has no discernible impact, one way or the other, on the domestic stock of nongovernmental issues. Their findings regarding threshold or market-size effects are ambiguous: the overall size of the economy as measured by aggregate

[36] They also find that GDP per capita as a measure of general economic and financial development has a positive effect in their benchmark regressions, although this effect weakens when they also include the vector of institutional controls mentioned in the previous paragraph, and the effect is relatively unstable when they disaggregate government and corporate bonds.

[37] Contrary to arguments emphasizing either crowding out or the advantages of a benchmark government bond.

GDP is positive and significant in their regressions for overall bond market capitalization but not in the separate regressions for bonds issued by the government, private financial firms, and private nonfinancial firms. They also report insignificant coefficients for the presence or absence of capita controls and the exchange rate regime, again in contrast to the results in Eichengreen and Leungnaruemitchai. It is hard to know whether these contrasts reflect their limited number of observations (as few as 34) or a substantive difference in findings.

Braun and Briones also find that a wide range of institutional variables seems to have relatively little effect. An exception is creditor rights, which enter negatively in the equations for overall bond market capitalization, government bond market capitalization, and corporate bond market capitalization alike.[38]

In addition, their dummy variable for Latin American countries enters with a significant negative coefficient in the regressions for overall bond market capitalization. Specifically, the Latin dummy is still significantly negative even though variables like creditor rights enter with significant coefficients and have a lower average value in Latin America than other parts of the world. This suggests that there is something else about Latin American countries not fully captured by the range of included explanatory variables causing bond market development to lag. The authors find negative coefficients on this regional dummy variable not just in their regressions for overall domestic market capitalization but also in separate regressions for government and private bonds. Interestingly, however, that negative coefficient is significantly less than zero only in the equation for public-sector bonds, as if there are particularly problems stunting the growth of government bond markets in the region that appear only once one controls for, inter alia, the size of budget deficits and the general level of economic development.

Braun and Briones consider a number of other dimensions of bond market development besides capitalization by aggregating data on the characteristics of individual corporate bonds issued in the period 1995-2004. They analyze, inter alia, the currency of denomination (own currency versus foreign), mean maturity (and share of bonds with a maturity of more than five years), mean yield to maturity, mean spread (in basis points), and the share of corporate bond issues that are investment grade. The limitation of this analysis is that their source, SDC Platinum, incompletely captures the issuance of government bonds, short-term government bonds in particular, and considers only long-term corporate bonds (those of at least one year to maturity) and hence they need to restrict their analysis to corporate bonds with maturity of at least one year. Still, there are a number of suggestive findings. The maturity of corporate bond issues depends not just on the general level of economic development (proxied by per capita GDP) but also on macroeconomic stability (maturity declines with inflation and budget deficits).[39] A more efficient and competitive banking system, as measured by the spread between bank deposit and lending rates and by banks' average overhead costs, seems to be associated with longer maturities of corporate bond issues, as if underwriting role of the banks shows up in this aspect of market development. Once more, the dummy variable for Latin America is negative and significant, as if the maturity of Latin

[38] This is consistent with the emphasis in de la Torre and Schmukler 2004, who argue that Latin American countries have smaller bond markets because of weaker enforcement of creditor rights.

[39] Questions can be raised about these results in particular, given the data set's limited coverage of short-term bonds.

American bonds is also shorter for other reasons not fully captured by the explanatory variables.

Other studies have considered subsets of these issues and markets. Burger and Warnock (2005) analyze the capitalization of local-currency bond markets, distinguishing total, government and private bonds. They find that countries with more variable inflation rates issue fewer local currency bonds. Stronger rule of law is positively associated with the capitalization of local-currency markets but does not obviously increase the local currency share (the ratio of local currency bonds to total bonds). Conversely, stronger creditor rights appear to affect the local currency share without affecting the overall size of the local-currency market. Finally, a stronger fiscal balance reduces government issuance of local currency government bonds but, interestingly, does not appear to affect private issuance in local currency or the total size of the local currency market. A problem here is that in constructing their data the authors make strong assumptions about currency denomination; for example, they assume that all bonds issued locally are in the home currency. In turn this raises questions about their findings.

Claessens, Klingebiel and Schmukler (2003) consider the determinants of government bond market development, distinguishing local-currency- and foreign-currency-denominated bonds.[40] Like Burger and Warnock, they are forced to make strong assumptions about currency denomination (that all bonds issued in the local market are in local currency). Consistent with Eichengreen and Leungnareumitchai, they find that country size is important for local-currency bond issuance. They also find that countries with larger banking systems have larger domestic currency bond markets, as if efficient banking systems and bond markets are complements rather than substitutes. Inflation as a measure of macroeconomic instability enters negatively as a determinant of market capitalization for domestic- and foreign-currency bonds alike. These authors consider a measure of political institutions (the extent of institutionalized democracy) rather than creditor rights (as in previous studies) as a measure of institutional strength, and find that this is positively related to market development.

Finally, the exchange rate regime appears to have different effects on domestic- and foreign-currency issuance. Countries with more flexible exchange rates, either de facto or de jure, have larger domestic-currency bond markets but smaller foreign-currency bond markets. This suggests that pegged exchange rates encourage governments to issue more foreign currency debt to take advantage of short-run reductions in debt-servicing costs and to signal the credibility of their commitment to the peg. Of course, this view is also consistent with moral-hazard arguments about some of the adverse effects of currency pegs.[41]

Hausmann and Panizza (2003) and Mehl and Reynaud (2005) focus on the share of domestic government debt that is in local currency and bears a fixed interest rate on the grounds that this is a particularly desirable form of funding – and one that

[40] Further results from this study are reported in de la Torre and Schmukler (2004).

[41] In regressions using the BIS data for 40-plus countries, we find hat the exchange rate regime has no differential effect (with respect to government bonds) on the currency composition of private (corporate and financial) bonds. When we drop industrial countries, we find that, with respect to the government sector, private issuers tend to issue more foreign currency bonds in presence of floating regimes. In the next section, we analyze in detail how the exchange rate regime affects the size of different segments of the domestic bond market.

governments in emerging markets have historically found it difficult to obtain. They find that lower inflation is positively associated with this form of funding. There is also some evidence of a positive association with the size of the investor base (proxied by the private-savings-to-GDP ratio). The two studies disagree on the impact of capital-account liberalization on this segment of the bond market, Mehl and Reynaud finding a positive effect as if liberalization encourages foreign participation but Hausmann and Panizza finding the opposite.

Burger and Warnock (2003) focus on this issue of foreign participation, using data on U.S. investors' holdings of foreign bonds as of the end of 2001. A problem with their study, for present purposes, is that their data on holdings of foreign bonds by U.S. investors includes both bonds floated on the issuing country's local market and international bonds placed in, inter alia, New York (both Bradies and global bonds). They find that U.S. investors favor bonds from countries with greater bilateral trade with the United States, more open capital accounts and less correlated returns. For local-currency bonds, however, only the variable measuring the correlation of returns is significant, and it reverses sign. When they omit the troublesome correlation variable, they find roles for credit rating and volatility: U.S. investors prefer stable markets with favorable credit ratings.[42] Given the small size of the sample and the correlation of the explanatory variables, which makes the coefficients on some explanatory variables sensitive to the inclusion of others, it is fair to say that the determinants of foreign participation remain an open question.

In sum, existing empirical studies suggest roles in bond market development for scale effects (country and/or issuing firm size), institutional development (the strength of legal and political rights), and macroeconomic policy (inflationary history in particular). They point to the importance of the regulation and development of the financial system more broadly (bond markets are larger in countries that have been able to relax capital controls and that also possess efficient and well-developed banking systems). Studies of the market in domestic-currency-denominated, long-maturity issues, the market segment that policy makers are most anxious to foster, find that the size of this market segment is particularly sensitive to the size of the investor base and to the country's inflationary history. But a number of other results are still disputed and uncertain. We attempt to shed more light on these in a following section.

4. Further Analysis

In this section, we follow Eichengreen and Luengnaruemitchai (2005) and Braun and Briones (2006) in testing for the determinants of bond market development. But in contrast to these previous studies, we focus on the determinants of the development of

[42] Finally there are studies can consider international capital flows via the bond market as their dependent variable. Ghosh and Wolf (2000) study debt flows using the basic gravity models and data on outflows from Germany, the US and Italy. They include only the standard gravity variables. Interestingly, these do not work very well, except in the case of the United States. Buch (2000a) uses IMF data on debt securities for 1997 only. In this study the basic gravity variables are well behaved and look similar to those in regressions for bank claims (suggesting in turn that the relatively poor results in the study by Ghosh and Wolf reflect the very limited nature of their sample). The impact of having a larger domestic banking system is ambiguous (this varies by source country). Finally, coefficients on the ratio of bank loans to total debt finance suggest that the relative importance of bond finance rises with the development of the host country, while country (population) size is otherwise insignificant, suggesting minimal economies of scale.

different segments of the market (markets in government, corporate and financial sector bonds) rather than considering the bond market as a single aggregate. In addition to standard regression analysis, we use a difference-in-differences methodology particularly well suited to identifying the differential effects of country characteristics on the development of these different market segments. And, relative to Eichengreen and Luengnaruemitchai, we have data for three additional years (2002-4) and as many as 14 additional countries.

Cross-Country Results for the Full Sample of Countries. Like Eichengreen and Luengnaruemitchai (2005) we use annual data from BIS and estimated the model using Generalized Least Squares with corrections for heteroskedasticity and panel-specific autocorrelation. But in the regressions with the full set of controls, we have as many as 491 additional observations.[43] In addition we explore what happens when we restrict our analysis to emerging market countries; and we add several additional controls and interactions. Specifically, we allow for non-linear effects of GDP, GDP per capita, and credit extended by the banking sector; control for the size of domestic savings, for the *de facto* exchange rate regime, for the level of the interest rate, for the size of total public debt (as opposed to the size of domestic government debt financed by issuing bonds), the interaction between capital controls and public debt, and a variable measuring the number of years since a country privatized its pension system; and we include a full set of regional and year fixed effects.

The first four columns of Table 1 consider the full sample of countries. Column 1 is for government bonds, column 2 for private (financial plus corporate) bonds, column 3 for corporate bonds, and column 4 for bonds issued by financial institutions. Many of our results are similar to those of Eichengreen and Luengnaruemitchai (2005). Like them, we find that country size is significantly correlated with the size of bond market (scaled by GDP).[44] We also find a positive, but not statistically significant relationship between private savings (scaled by GDP) and the size of the financial and corporate bond market and a negative relationship (still insignificant) between private savings and the amount of government bonds.

Next, we consider the effect of the exchange rate regime, using the index of de facto exchange rate arrangements of Levy-Yeyati and Sturzenegger (2005). We include a dummy variable taking value one when a country has a *de facto* fixed exchange rate regime (FIX) and a dummy taking value one when a country has an intermediate regime (INTER); thus, floating rate is the excluded alternative. We find that the exchange rate regime makes no difference for the government and corporate bond markets but that

[43] We were able to expand the sample by using different sources for some of our controls. The Appendix includes a list of our sources. Our sample differs across columns because, in order to control for outliers, we drop all observations for which the dependent variable takes value which are 3 standard deviations above the sample mean. By doing so we drop 5 observations for government bonds (2 for Japan and 3 for Lebanon), 12 for corporate bonds (2 for Iceland, 3 for Korea and 7 for Malaysia), and 22 for financial bonds (16 for Denmark, 3 for Iceland and 3 for the United States).

[44] In the case of government bonds, however, the relationship is non-linear, and the point estimates indicate that the level of GDP that maximizes the size of the private bond market relative to GDP is US$ 7 trillion (the 90th percentile of the distribution). We also find a positive and concave relationship with GDP per capita, as if the government bond market reaches a maximum relative to country size when GDP per capita is around US$30,000, while the private bond market reaches its maximum when GDP per capita is well above US$40,000.

countries with a fixed exchange rate regime have a smaller market for private bonds than countries with a floating exchange rate regime. In contrast, intermediate regimes are not different from floating regimes for private bonds but are associated with larger government bond markets.

The level of the interest rate (IRATE) is negatively correlated with the size of the market for government bonds and but not significantly correlated with the size of the private bond market.[45] We also find that the volatility of the interest rate is negatively correlated with the size of the government bond market and but positively correlated with the size of the private bond market.[46]

We find a concave relationship between the size of the market in bonds issued by financial institutions (and private total bonds in general) and domestic credit provided by the banking sector (DOMCR). The point estimates indicates that the market in bonds issued by financial institution reaches a maximum when domestic credit provided by the banking sector is about 160 percent of GDP, this is close to the 95th percentile of the distribution of DOMCR.[47] This result suggests, plausibly, that banks that operate in more developed markets fund a large share of their operations by issuing bonds instead of taking deposits.

Unlike Eichengreen and Luengnaruemitchai (2005), we find no significant correlation between banking spread (SPREAD) and the size of the government bond market. Instead we find that the spread is positively correlated with the size of the corporate bond market, while the opposite is true for financial bonds; these tend to be smaller when banks have higher spreads. The first result indicates, somewhat surprisingly, that the corporate bond market is more likely to develop in countries where banks have market power. This result is surprising given the widespread presumption that banks with market power will discourage the development of alternative sources of external finance. Our results suggest that they may in fact have limited ability to do so. On the supply side, firms are more likely to utilize bond finance when bank lending rates are high.. On the demand side, investors are more likely to be interested in buying bonds when bank deposit rates are low.[48] The second result suggests that, insofar as high spread are associated with low deposit rates, banks do not have incentives to fund their operations by issuing bonds.

As in Eichengreen and Luengnaruemitchai (2005), we find a positive relationship between absence of capital controls and the size of the government bond market. Our measure of capital controls ranges between 1 and 11, with 11 indicating no restrictions on capital account transactions. We find no significant relationship between the presence of capital controls and the size of the private bond market. The point estimates suggest that moving from a fully open to a fully closed capital account would lead to a one percentage point increase in the size of the domestic corporate bond market.

As expected, we find that a larger public debt is associated with a larger market for government bonds. (Here we look at total public debt, no matter how financed.)

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[45] We censor IRATE at 100%.

[46] Eichengreen and Luengnaruemitchai 2005 found no significant relationship in both cases.

[47] When we focus on government and corporate bonds, we find no significant effect of DOMCR.

[48] There are two differences between our definition of SPREAD and that of Eichengreen and Luengnaruemitchai (2005). First, we define spread as the difference between lending and deposit rate a bit differently. Second, we scale the spread by the deposit interest arte in order to remove the effect of the average interest rate (see the Appendix for details).

More interestingly, we also find a positive and significant coefficient for financial bonds. This seems to indicate that the positive contribution of government bonds, in providing a benchmark asset and facilitating the development of secondary market liquidity, dominates any negative "crowding out" effects.

We also consider the interaction of public debt and capital controls (DEBT_KCON) as a way of testing whether in presence of a large public debt capital controls are effective in creating a captive investor base.[49] If so we should find a negative coefficient for DEBT_KCON. We in fact find the opposite: DEBT_KCON is positive and statistically significant in columns 1 and 4.

Given that a variety of emerging markets privatized their pension systems in the 1980s and 1990s, we ask whether pension privatization stimulates the growth of the bond market. We construct a variable (YR_PR) measuring the number of years since the beginning of the privatization process. (YR_PR takes a value zero for countries that never privatized their pension systems.) We find that the coefficients are always large, positive and statistically significant. Not surprisingly, the effect is largest for government bonds (pension funds often being subject to regulations preventing them from purchasing speculative-grade corporate paper). Each extra year after the privatization of the pension system adds 1.2 percentage points to the size of the market in government bonds, compared to 0.7 percentage points for the markets of bonds issued by financial institutions and 0.2 percentage points for corporate bonds.

Focusing on measures of institutions and corporate governance, we find that rule of law, investor protection and lower cost to enforce a contract are positively correlated with a larger bond market (for both private and government bonds), other time-invariant characteristics are also important. We find that, compared with countries with a British legal code (the excluded alternative), countries with a French legal code tend to have larger bond markets (both private and corporate), while countries with a socialist legal code tend to have smaller private bond markets. Countries with a German or Scandinavian legal code have the largest private bond markets. Finally, latitude (often used as a proxy for institutional development) is negatively correlated with the size of the private bond market (a result driven by the market for bonds issued by financial institutions) and government bond market. These results are puzzling insofar as they indicate that the well-known positive effect of British legal origin on the size of the domestic financial system does not translate to the size of the bond market. The same paradoxical result obtains for institutional quality as proxied by latitude.[50]

The last four coefficients indicate that, after controlling for all factors enumerated above, we still find that East Asia and Latin America have significantly smaller government bond markets than the industrial countries. Latin America has the smallest government bond market of all. The "OTHER" emerging market group has the largest government bond market (a result driven by South Africa).

[49] We compute the interaction by subtracting from PUBLICDEBT and KCON their mean values, so that including the interaction has no effect on the estimates of the main coefficients.

[50] This result is driven by the fact that we control for several variables that are correlated with legal origin. If we run a regressions without controls, we find that countries with the French and Socialist legal code have the smallest private bond market and that latitude is positively correlated with the size of the private bond market.

But if we focus on corporate bonds, we find that emerging markets in fact have larger corporate bond markets than industrial countries (the coefficients are not statistically significant for Latin America and ECA), controlling for the vector of observable country characteristics included in our regression analysis. East Asia now has the largest corporate bond market (significantly larger than that of both the industrial countries and that of Latin America). The "OTHER" group has the largest markets for bonds issued by financial institutions and Latin America has the smallest (significantly smaller that the industrial countries and East Asia).

Overall, this tells us that country characteristics fully explain the substantial differences in the development of corporate bond markets between the industrial and developing countries, as documented above in Figure 6. However, country characteristics explain only half of the difference between the development of the government bond market of industrial and developing countries. In the case of corporate bonds markets, in other words, something else in addition is going on. That "something else" is most dramatically visible in the case of Latin America.

Figure 28 compares the size of the bond markets of industrial countries with those of Latin America and East Asia and shows what happens if control for all the variables included in Table 1.[51] After controlling for these country-specific variables, East Asian bond markets are as large as industrial-country bond markets. Indeed, East Asia's private (corporate and financial-sector-issued) bond markets are even larger than those of the industrial countries, controlling for these country characteristics. In the case of Latin America, in contrast, we find that if the region had the same country-characteristics as the industrial countries, its bond markets would remain 30 percent smaller than that of industrial countries.

Cross-Country Results for Emerging Markets. Columns 5-8 of Table 1 restrict the sample to 21 emerging market economies. The main differences between these regression and those on the full sample can be summarized as follows. Country size no longer appears to matter for government bonds. Emerging markets with a fixed exchange rate tend to have larger government bond markets. However, the exchange rate has no impact on the size of the private bond market. Contrary to the results for the full sample, we find a negative association between the volatility of the interest rate and the size of the private bond market and that bank credit to the private sector is more important for corporate than for financial bonds.

In the full sample we found that less stringent capital controls were associated with a larger market for government bonds and that they had no effect on private bond market capitalization. In the emerging market subsample we now find that the coefficient for government bonds is negative (but not significant) and that for financial bonds is negative and significant. These results seem to indicate that in developing countries higher capital controls are associated with larger bond markets.[52] The results for public debt are also interesting. In the case of government bonds we still find a positive and

[51] There are three reasons why the no-control columns of Figure 28 are different from those of Figure 6: (i) Figure 6 uses weighted averages while Figure 28 uses simple averages; (ii) Figure 6 shows data for 1994 and 2004, while Figure 28 shows data for the whole period going from 1991-2004; (iii) Figure 6 uses all countries for which we have data on the size of the bond market and Figure 28 only uses observations included in the regressions of the first 4 columns of Table 1.

[52] However, this result does not hold for corporate bonds where, contrary to what we found for the whole sample, we find a positive and significant coefficient.

statistically significant coefficient. However, the point estimate is about one half (and the t statistics less than one third) that of the whole sample, indicating that emerging market countries tend to finance a much larger share of their public debt by borrowing abroad (in fact, if we restrict the sample to industrial countries we find a point estimate of 0.7 with a t statistics of 23). Finally, we find that rule of law is never statistically significant but that investor protection is very important for both financial and corporate bonds.

Table 2 repeats the analysis of Table 1 by scaling the size of the bond market by domestic credit instead of GDP. When we use both industrial and emerging market countries, we find that the size of the government and corporate bond markets are negatively correlated with domestic credit indicating that when domestic credit grows, these segments of the bond market grow at a slower rate. We also find a concave relationship between domestic credit and the size of the market for bonds issued by financial institutions. The point estimates indicate that this segment of the bond market grows faster than domestic credit until when domestic credit reaches 90 percent of GDP (this is close to the median value of DOMCR) and then starts growing at a slower rate. Focusing on capital controls, we always find that more capital controls are associated with larger private bond markets (however, only the coefficients for financial bonds is statistically significant). This seems to indicate that the presence of capital control favors the switch from bank credit to bonds. We also find that public debt is always positively correlated with bond market development, indicating that when we use the domestic credit metric, the market development effect of having a larger public debt dominates the crowding out effect. Rule of law and investor protection are significant in the regressions for private bonds but not in those for government bonds, while the cost of enforcing a contract is significant for all types of bonds.

Note that while simple comparisons indicate that, when scaled by domestic credit, East Asia and Latin America's bond market were of similar size, we find that after controlling for country characteristics the East Asian Bond market is much larger than that of Latin America. Figure 29 shows that if we were to assign to East Asian countries the characteristics of the industrial countries, we would find that the two regions would have bond markets of similar size (with East Asia having a much larger private market).[53] This follows from the fact that the coefficients are constrained to be equal across regions and the explanatory power of the estimated equations is relatively high.[54]

When we focus on our sample of emerging market countries, we find no significant relationship between domestic credit and the size of the private bond market, and contrary to what we found for the whole sample, we find that capital controls are

[53] Figure 29 differs from Figure 8 for the same reasons why Figure 6 differs from Figure 28.

[54] However, assigning the country characteristics of industrial countries to Latin America would lead to an even smaller bond market (and negative amount of government bonds!). One reason for this is the positive association of years since the privatization of pension schemes with bond market capitalization and the fact that pension schemes tended to be privatized earlier in Latin America. Another reason is the negative relationship between the size of the financial market and the ratio of government bonds and domestic credit. Our estimates imply that the association between government bond market capitalization and domestic credit remains negative until domestic credit reaches 260 per cent of GDP. In the industrial countries, this ratio averages 116 per cent and its square 165 per cent, while the analogous values for Latin America and the Caribbean are 42 and 22 per cent, respectively.

associated with a smaller corporate bond and we find a much stronger effect of investor protection.[55]

Differences in Differences Analysis. While the preceding provided an idea of how country characteristics affect the development of the private and government bond markets, it did not allow us to easily identify the differential effects of these characteristics on the various segments of the bond market. We now do this by estimating equation of the form:

$$BOND/GDP_{j,i,t} = \alpha_{i,t} + \beta TYPE_j + \gamma\left(X_{i,t} * TYPE_j\right) + \varepsilon_{j,i,t}$$

where *BOND/GDP* is the ratio of outstanding type *j* bonds to GDP (we have 3 types of bonds: government, financial, and corporate) in country *i* and year *t*, $\alpha_{i,t}$ is a country-year fixed effect, *TYPE* is a dummy variable taking value one when the bond is of type *j*, and *X* is a matrix of country characteristics (we use the same set of variables used in Table 1). While this difference-in-differences approach cannot tell us anything about the determinants of the absolute size of the bond market, it can help us estimate precisely what factors affect the relative size of a type of bond market, holding constant all country-year characteristics.

Column 1 of Table 3 estimates the above equation by using government bonds as omitted alternative. The first sub-column reports the coefficients of the *X*CORP* interactions indicating how the various country characteristics affect the size of the corporate bond market, *relative* to that of the government bond market, while the second sub-column reports the coefficients of the *X*FIN* interactions indicating how the various country characteristics affect the size of the financial bond market, *relative* to that of the government bond market. Columns 2 and 3 estimate similar model with financial institutions' bonds and corporate bonds as excluded dummies.[56]

The main messages of Table 2 can be summarized as follows. It is not clear that high levels of institutional quality are associated with relatively larger private bond markets. In fact, the coefficient of rule of law is positive, but the government bond market seems to be relatively large in countries with high levels of investor protection and low costs to enforce a contract. We also find no significant relationship between the relative size of the private bond market and GDP per capita. However, countries with higher and more volatile interest rate tend to have larger private bond markets. Pension privatization has no differential impact on the different types of bonds.

When we compare the market in bonds issued by nonfinancial corporations with the market for bonds issued by financial institutions, we find that the corporate bond market tends to be particularly large in countries with less efficient banking sectors (i.e., countries with high banking spreads and high levels of bank concentration) and in countries with the English legal code. The first finding is straightforward; the second one presumably reflects the fact that the countries that adopted the legal code in the English tradition have market based financial systems while countries with legal systems based

[55] In addition, contrary to results for the whole sample, we find that Latin American countries tend to have a financial bond market which is similar to that of East Asia.

[56] Clearly the results of the three columns are symmetrical and they could all be obtained by algebraic manipulations of column 1, however, by presenting them separately we are able to directly test the differences between the various types of bond market.

on civil law are more likely to have bank based financial systems (Demirguc-Kunt and Levine, 1999). We also find that the presence of capital controls and fixed exchange rates (which often go hand in hand) are associated with relatively large corporate bond markets. As one may expect, we find that a larger financial system is associated with a relatively larger share of financial bonds but, interestingly, this effect reverses in countries with very large financial systems.

Table 4 repeats the same experiment but now restricting the sample to emerging markets. It appears that the financial and corporate segments of the private bond market are more homogenous in emerging markets (the only difference are for investor protection and French legal code which are associate with relatively larger financial bond markets). But there are still important differences between private and government bond markets. For example, the level of private savings and rule of law are important determinants of the relative size of the private bond market; in addition, they are the key factors explaining differences in the development of the Latin American and East Asian bond markets.[57] Again, the relationship between the size of the financial sector and the relative development of the private bond market appears to be non-linear. The point estimates suggest that the relative size of the private bond market initially tends to decline with the growth of the financial sector, but this relationship reverses in countries with highly developed financial systems. An interpretation is that development of the banking system initially enables financial institutions to gain ground relative to financial markets (banks gain a larger share of total private intermediation) but further development of the banking system (and an efficient, competitive, well-functioning banking system in particular) leads to a rising share of market-based (bond-based) finance in the total, as if an efficient banking system and a liquid private bond market are complements in the long run (as we suggested at the beginning of our paper).

5. Conclusions

This paper has documented the underdevelopment of Latin American financial markets, and Latin American corporate bond markets in particular. It started by asking whether the underdevelopment of the Latin American bond market is bound to be long lasting or whether improvements in policies and institutions might enable Latin America to catch up relatively rapidly with other regions. We then identified a handful of important factors associated with the underdevelopment of Latin American bond markets. Specifically, our statistical analysis shows that a limited number of observable policy variables and country characteristics explain some 70 percent of the difference between in bond market capitalization between Latin America and the industrial countries. This same set of observable variables also explains the entirety of the difference in the development of the market in the bonds of corporations and financial institutions between the two regions.

If we take these 22 country characteristics and replace their average values for Latin American their average values for the industrial countries, we presumably find that the two regions would have private bond markets of similar size. As above, this follows automatically from the fact that the coefficients are constrained to be equal across regions

[57] We also find the same puzzling results we found before with the relative size of the government bond market being positively associated with higher levels of investor protection and lower cost to enforce a contract.

and the explanatory power of the estimated equations is relatively high. Does this therefore mean that rapid improvements in policies and institutions would quickly close the gap? Unfortunately not. Improvements in policy take time to work their effects. In addition, our statistical analysis shows that a quarter of the difference in bond market capitalization between industrial countries and Latin America is due to country size (measured by aggregate GDP) and the level of development (measured by GDP per capita). About 15 percent of difference is attributable to the development of the financial system (measured by bank credit to the private sector) and another 15 percent is related to historical and geographical factors (like the origin of the legal code and other measures of institutional inheritance). The only policy variables that seem to be play an important role are macroeconomic stability (proxied by the volatility of the exchange rate), openness, investor protection and the cost of enforcing a contract, but these can explain at most one quarter of the difference between the Latin America and the industrial countries. Policy variables like the exchange rate regime, the presence or lack of capital controls, the level of public debt, bank concentration, and banking spreads are all statistically significant in the empirical analysis but play a very small role in explaining the difference between the development of the bond market of industrial countries and that of Latin America.

While this clearly does not mean that policies and institutions do not matter, it clearly means that there is no convenient short-cut. By implication, the same policies that are necessary for economic development in general are also necessary for the development of domestic bond markets.

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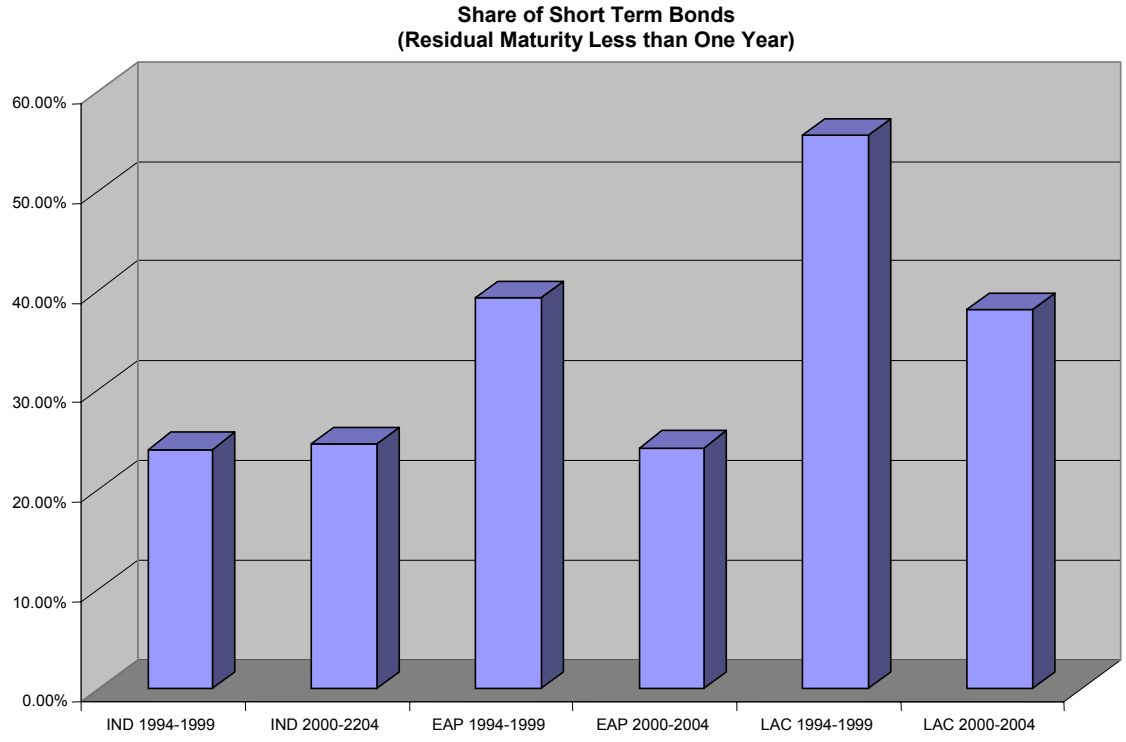
Appendix: Data Sources

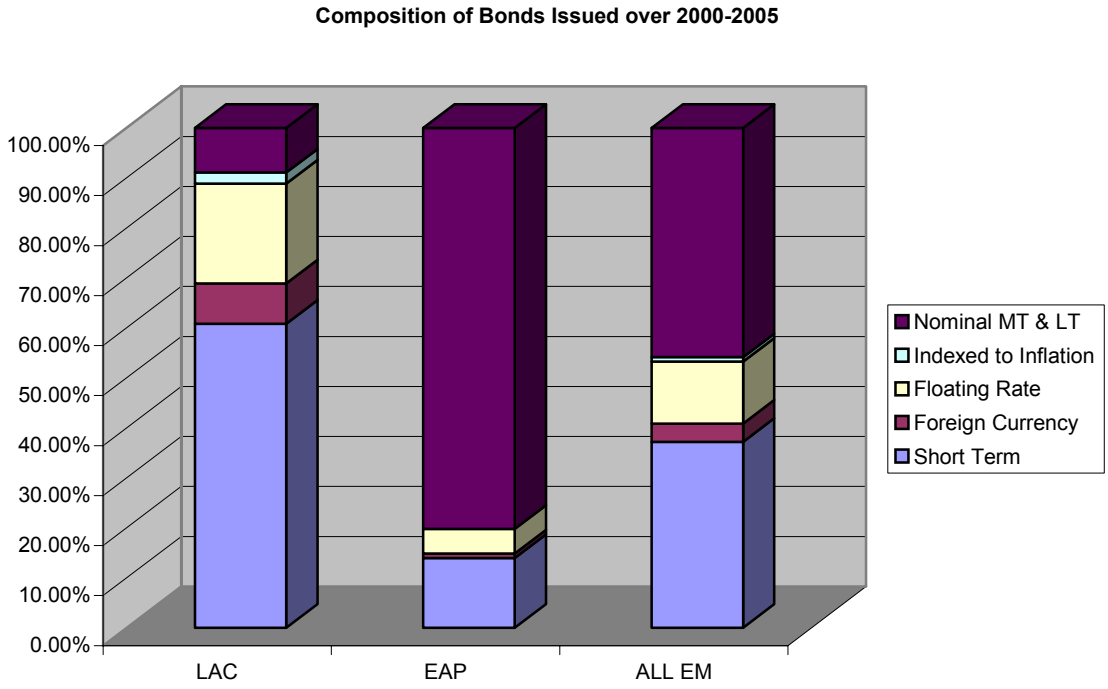
GBOND/GDP	All measures for amount of outstanding bonds are form the BIS securities statistics Tables 16a
CBOND/GDP	and 16b. Available at http://www.bis.org/statistics/secstats.htm. The ratios were computed using
FBOND/GDP	data in current dollar GDP from the World Bank's World Development Indicators.
GDP	GDP in current Purchasing Power Parity Adjusted dollars. Source: World Bank's World Development Indicators.
GDP_PC	GDP Per capita in current Purchasing Power Parity Adjusted dollars. Source: World Bank's World Development Indicators.
EXP	Exports over GDP. Source: World Bank's World Development Indicators.
PRSAV	Private Savings over GDP. Source: World Bank's World Development Indicators.
FIX	Fixed exchange rate dummy. Source Levy-Yeyati and Sturzenegger (2005)
INTER	Intermediate exchange rate dummy. Source Levy-Yeyati and Sturzenegger (2005)
IRATE	Interest rate (average between lending and deposit rate). Source: World Bank's World Development Indicators and IMF International Financial Statistics. IRATE was used to compute SD_RATE
DOMCR	Bank credit to the private sector. Source: World Bank's World Development Indicators and IMF International Financial Statistics
CONC	Bank Concentration. Source: Micco, Panizza and Yañez (2006)
SPREAD	Bank spread (lending rate minus deposit rate). Source: World Bank's World Development Indicators and IMF International Financial Statistics
KAPCON	Capital Controls. Source: Brune (2006)
PUBLICDEBT	Central Government debt over GDP. Source: Jaimovich and Panizza (2006)
YR_PR	Number of years since privatization of the pension system. Source: www.fiap.cl
RULEOFLAW	Index of Law and Order: Source ICRG.
INVPROT	Investor Protection: Source Doing Business Database
CONTR_COST	Cost to enforce a contract: Source Doing Business Database
FRENCHLAW	Dummy variable taking value one for countries with French Civil Law. Source: la Porta et al. (1998)
SOCLAW	Dummy variable taking value one for countries with Socialist legal origin. Source: la Porta et al. (1998)
GERSCANLAW	Dummy variable taking value one for countries with German or Scandinavian legal origin. Source: la Porta et al. (1998)
LATITUDE	Latitude

Figure 1



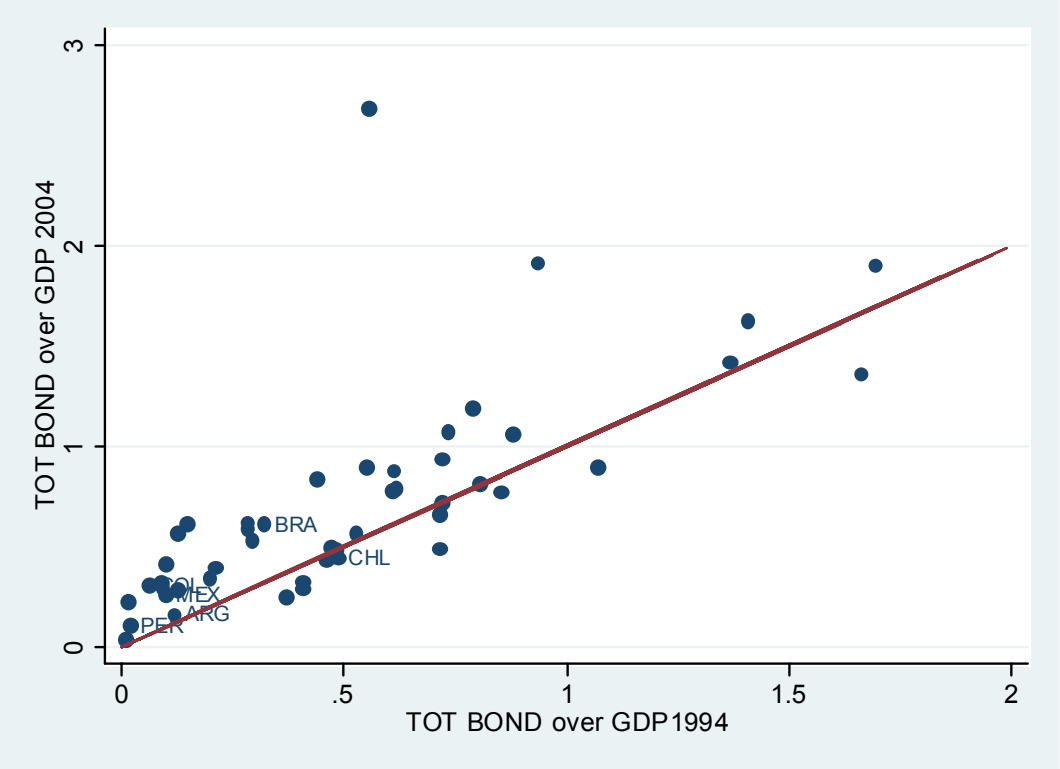
Source: Authors' calculations based on BIS data

Figure 2



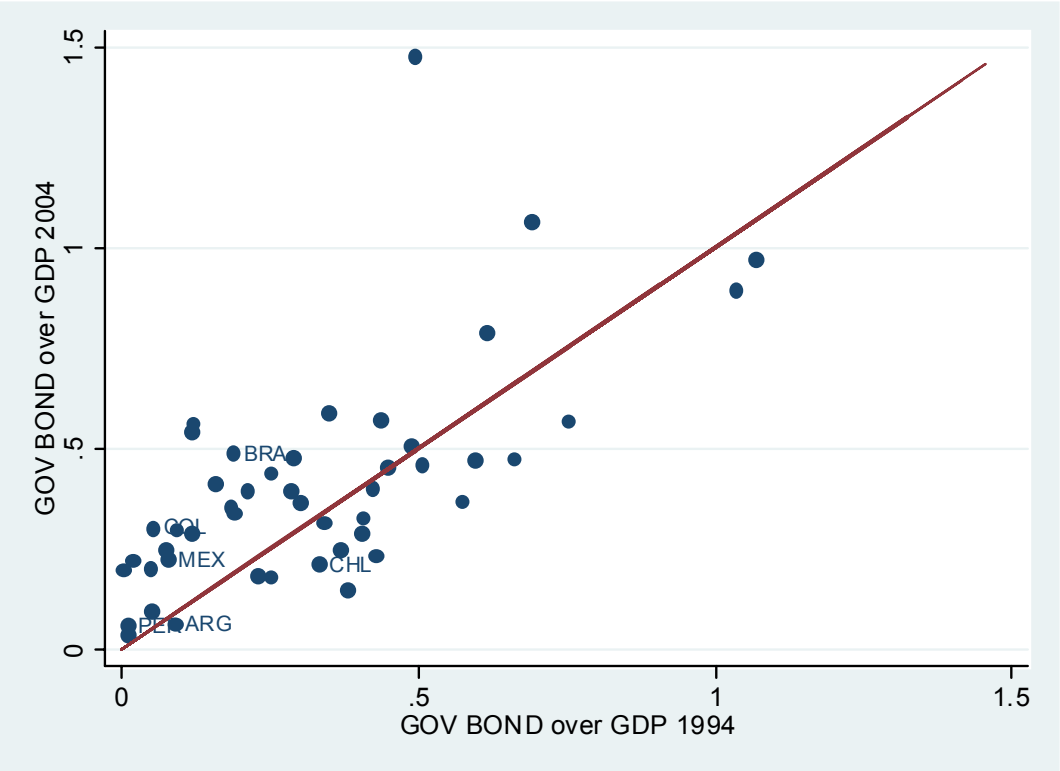
Source: Authors' calculations based on EMWARE data

Figure 3. Growth of the Bond Market, 1994-2004



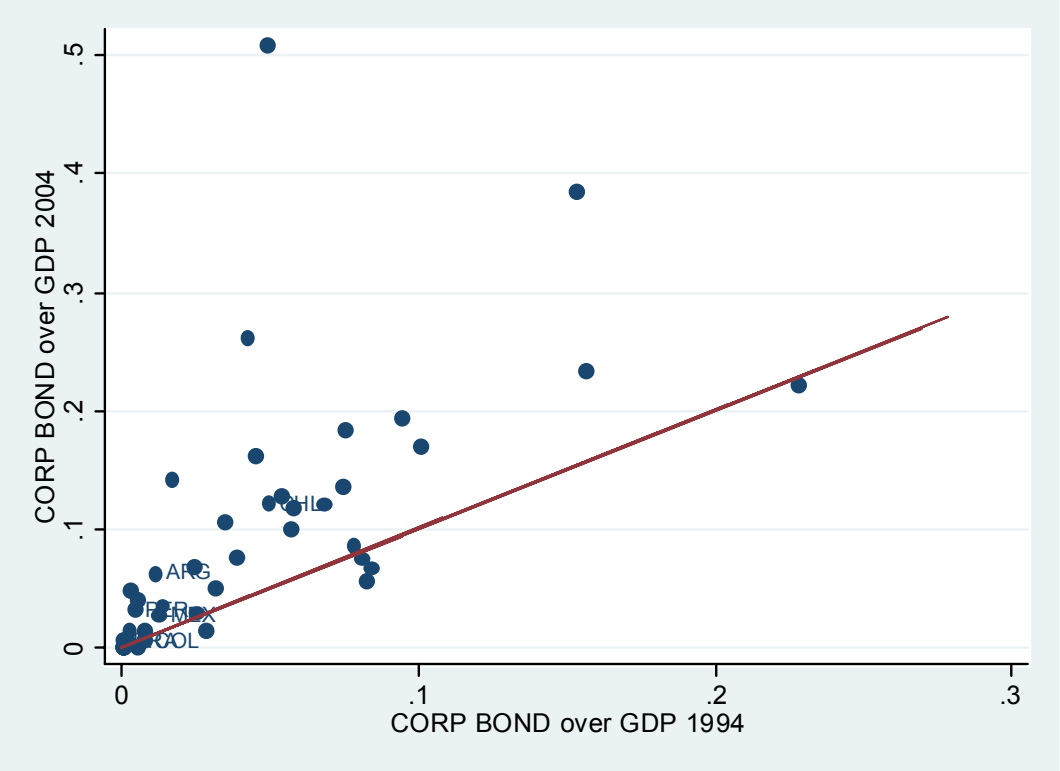
Source: Authors' calculations based on BIS data

Figure 4. Growth of the Government Bond Market, 1994-2004



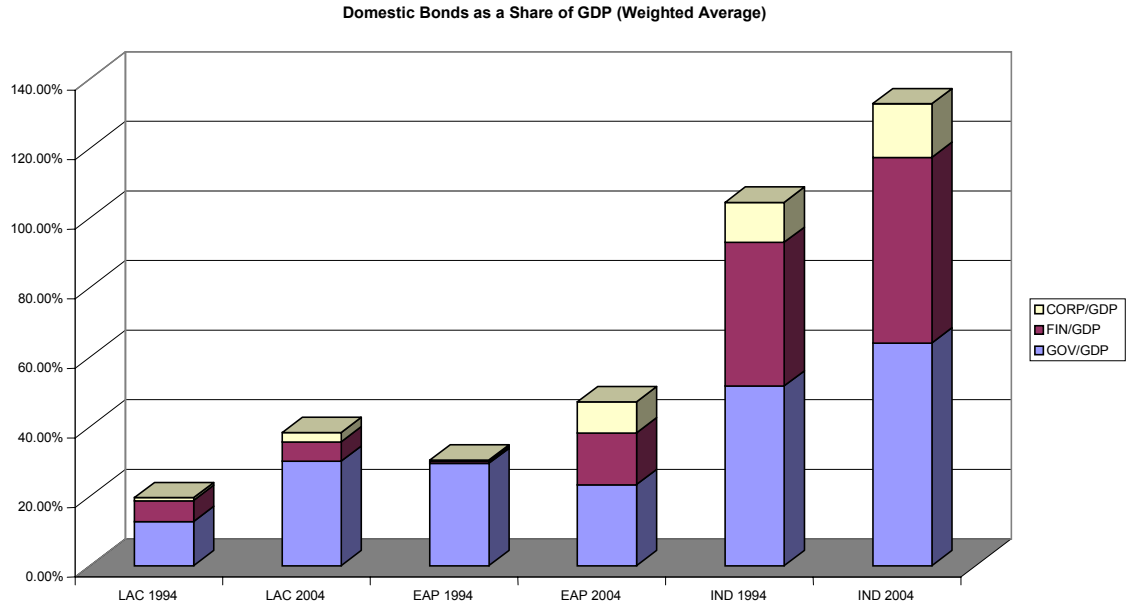
Source: Authors' calculations based on BIS data

Figure 5. Growth of the Corporate Bond Market, 1994-2004



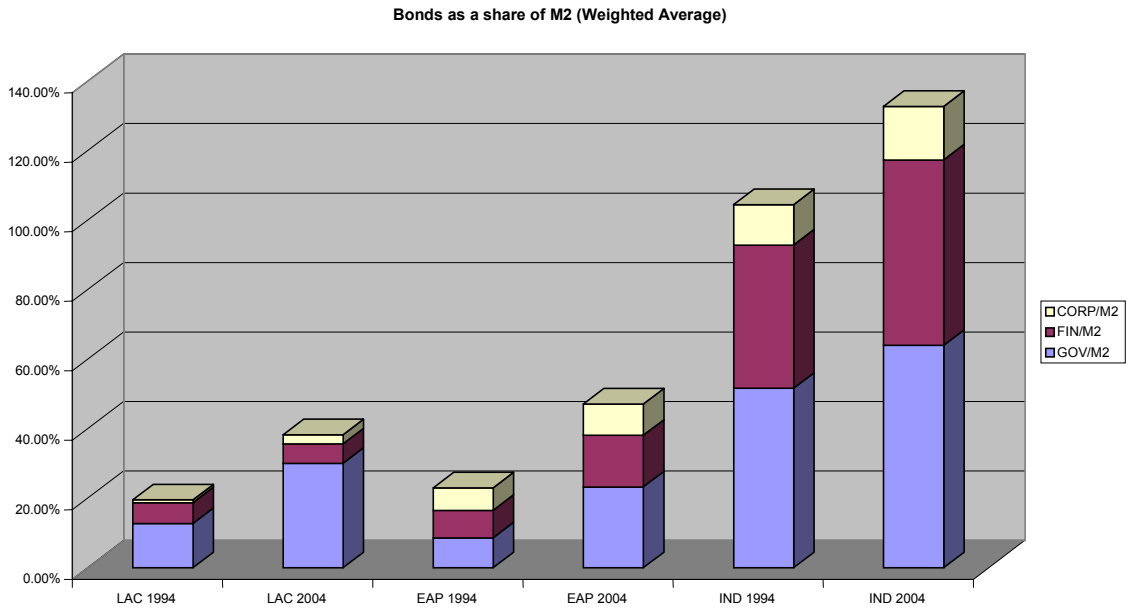
Source: Authors' calculations based on BIS data

Figure 6



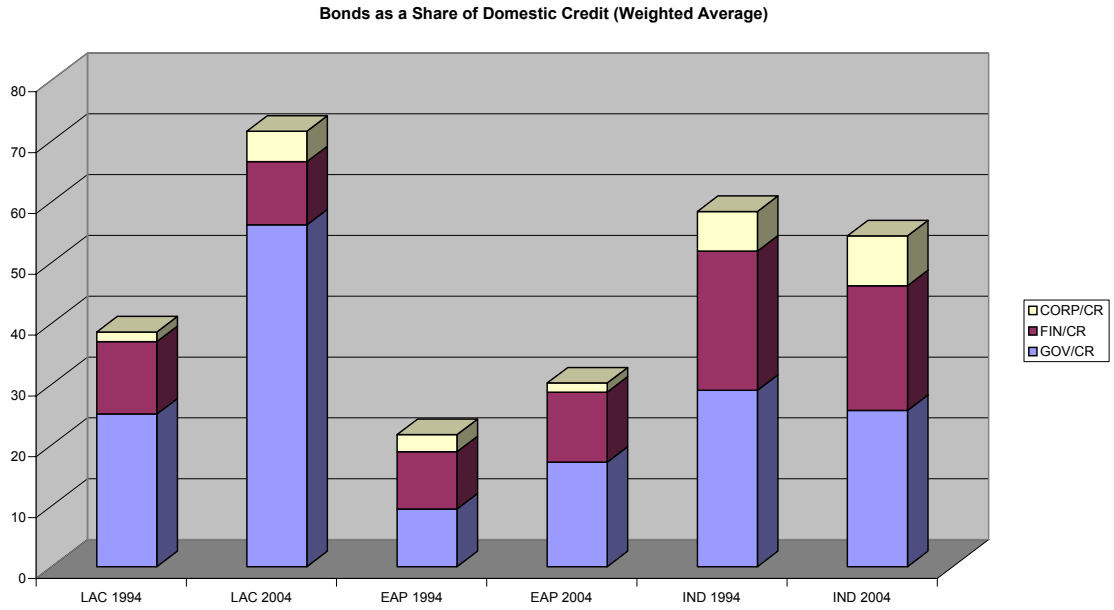
Source: Authors' calculations based on BIS data

Figure 7



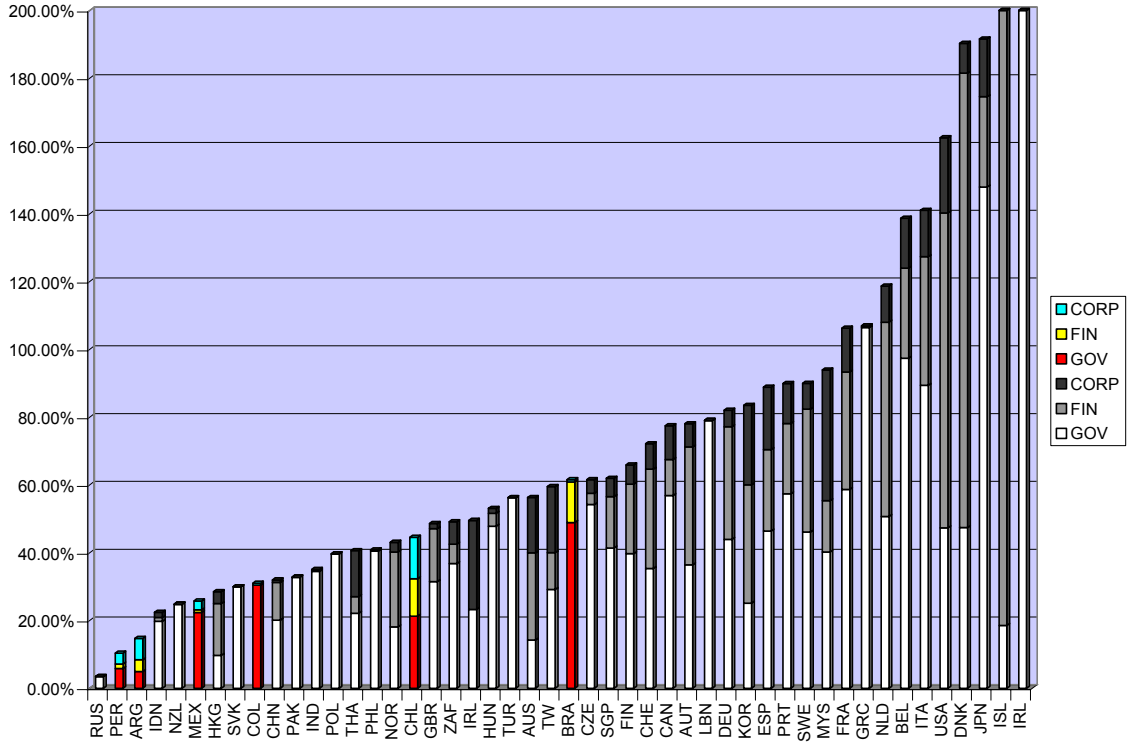
Source: Authors' calculations based on BIS data

Figure 8



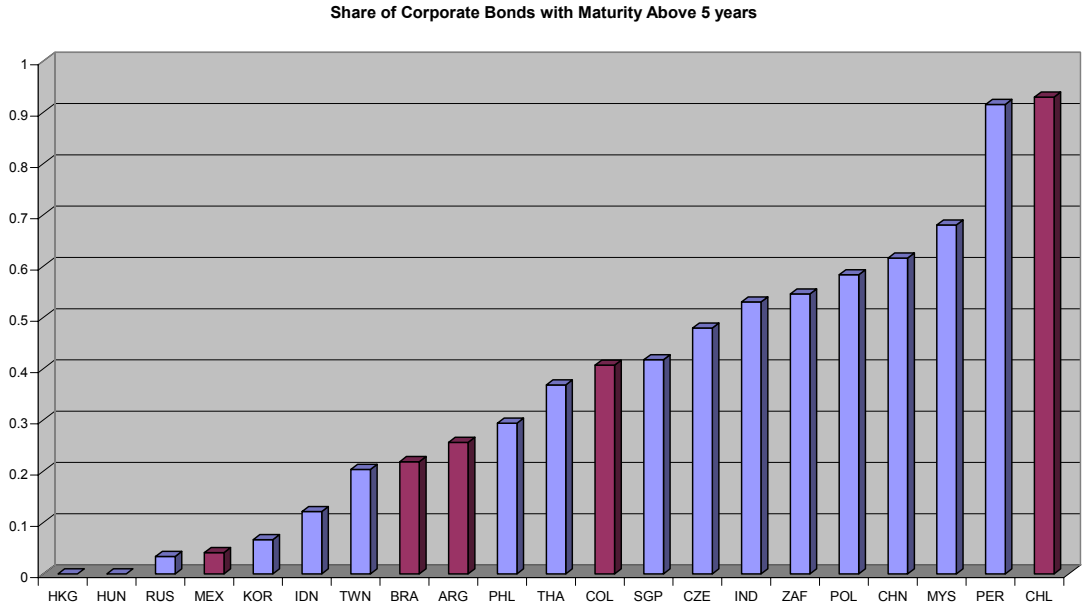
Source: Authors' calculations based on BIS data

Figure 9. Bond Market Capitalization by Country



Source: Authors' calculations based on BIS data

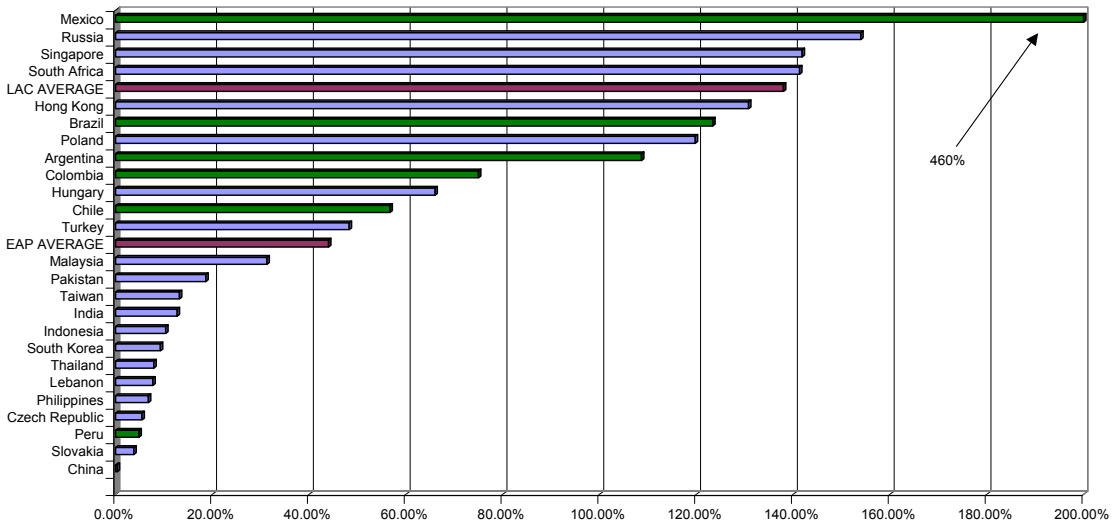
Figure 10



Note: maturity of corporate bonds issued in the period 2000-2005.
Source: Authors' calculations based on EMWARE data

Figure 11

EMTA Trading of Locally Issued Bonds as a Share of Oustanding Domestic Bonds



Turnover is expressed as a ratio of trading of local instrument reported in the 2004 EMTA survey and the total amount of domestically issued bonds reported by BIS. Regional averages are unweighted.

Figure 12

EMTA Trading of East Asian and Latin American Instruments

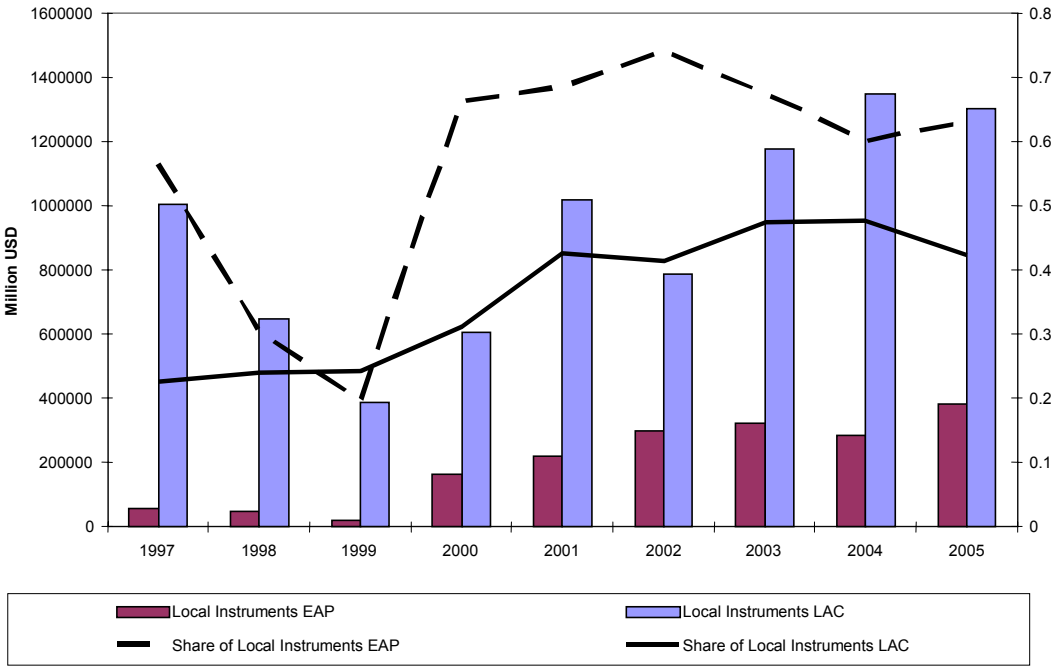
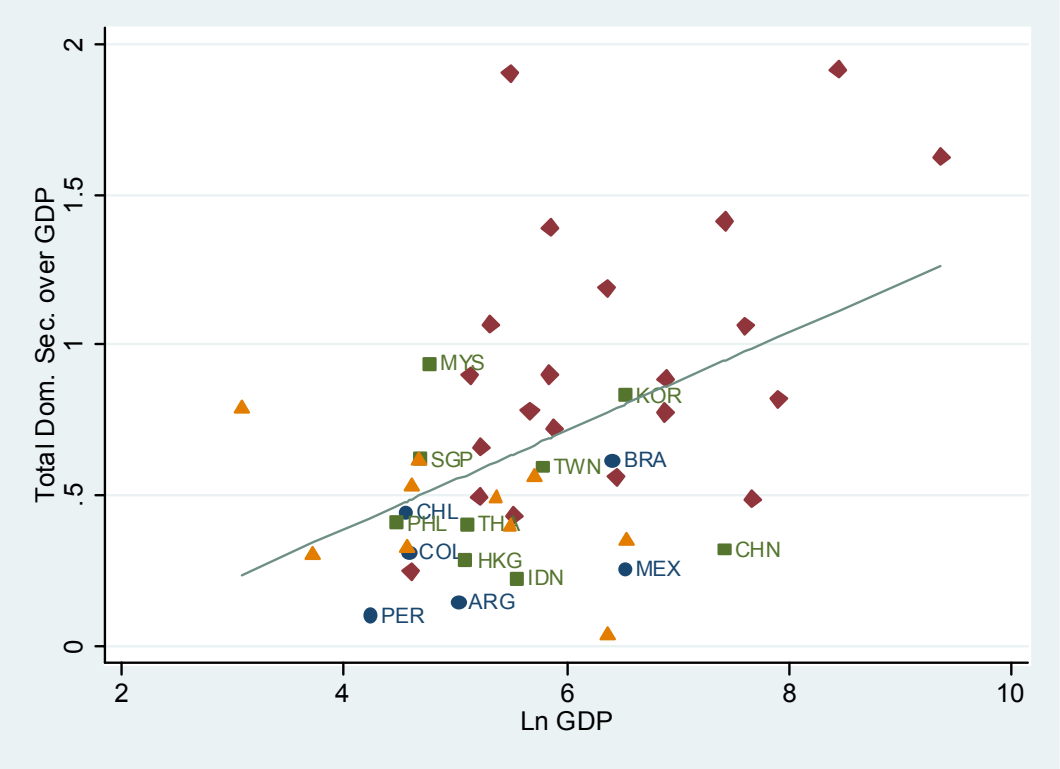
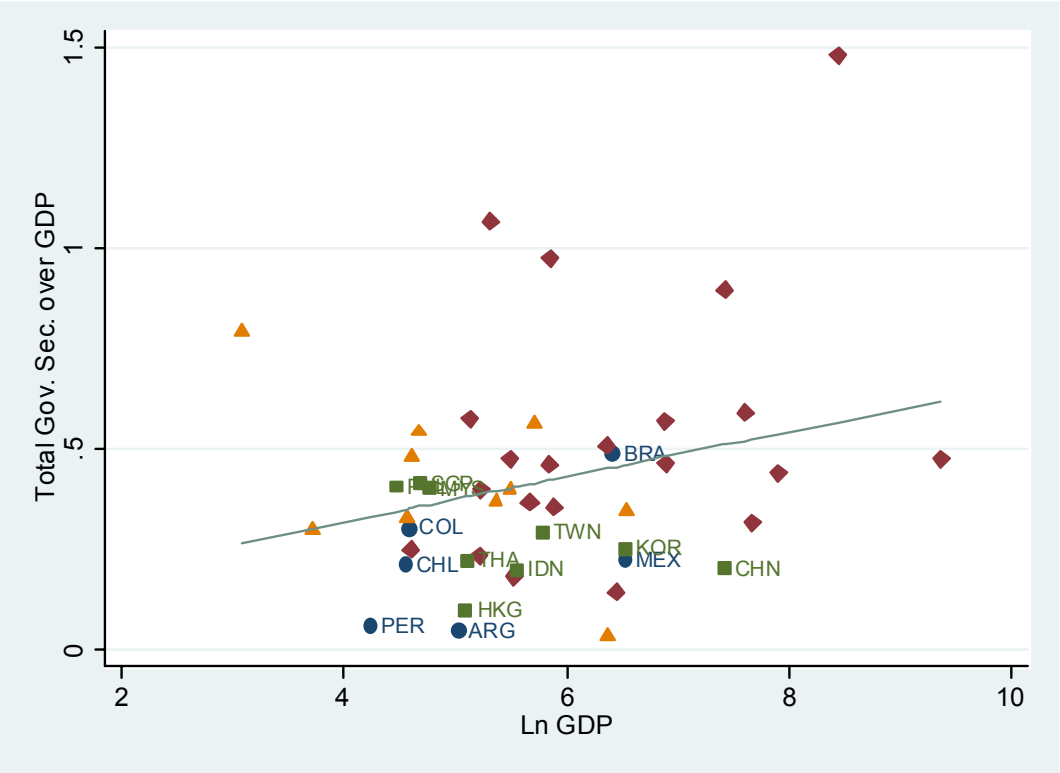


Figure 13. Bond Markets and the Size of the Economy



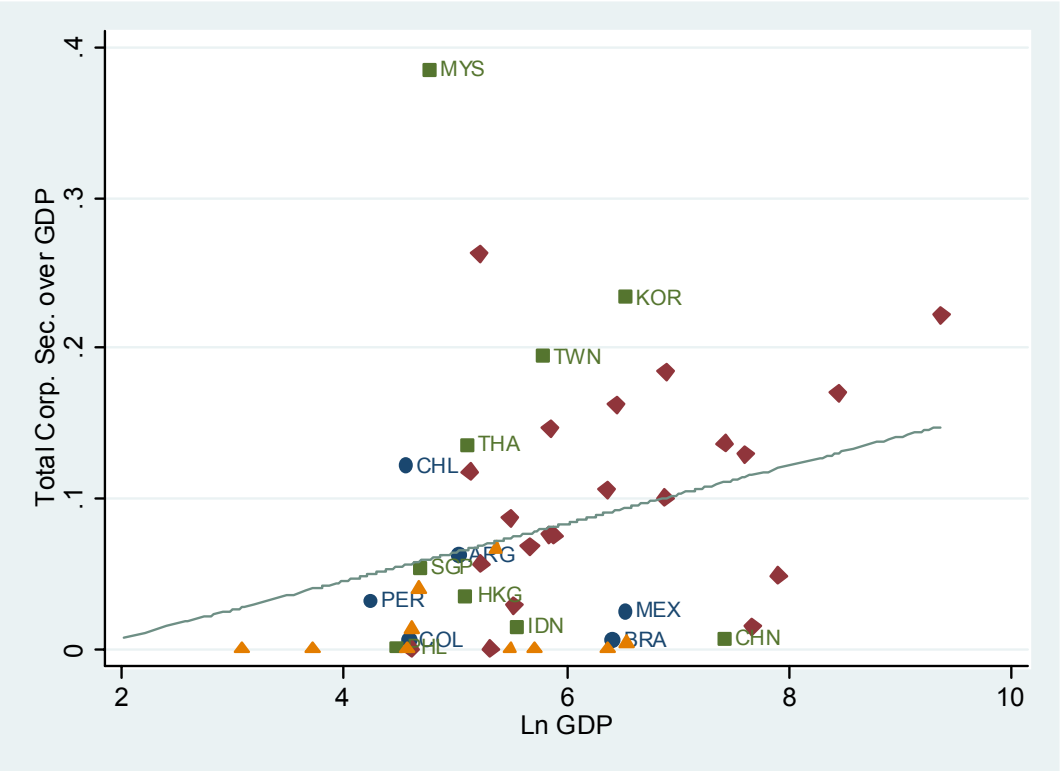
Source: Authors' calculations based on BIS and World Bank data

Figure 14. Government Bond Markets and the Size of the Economy



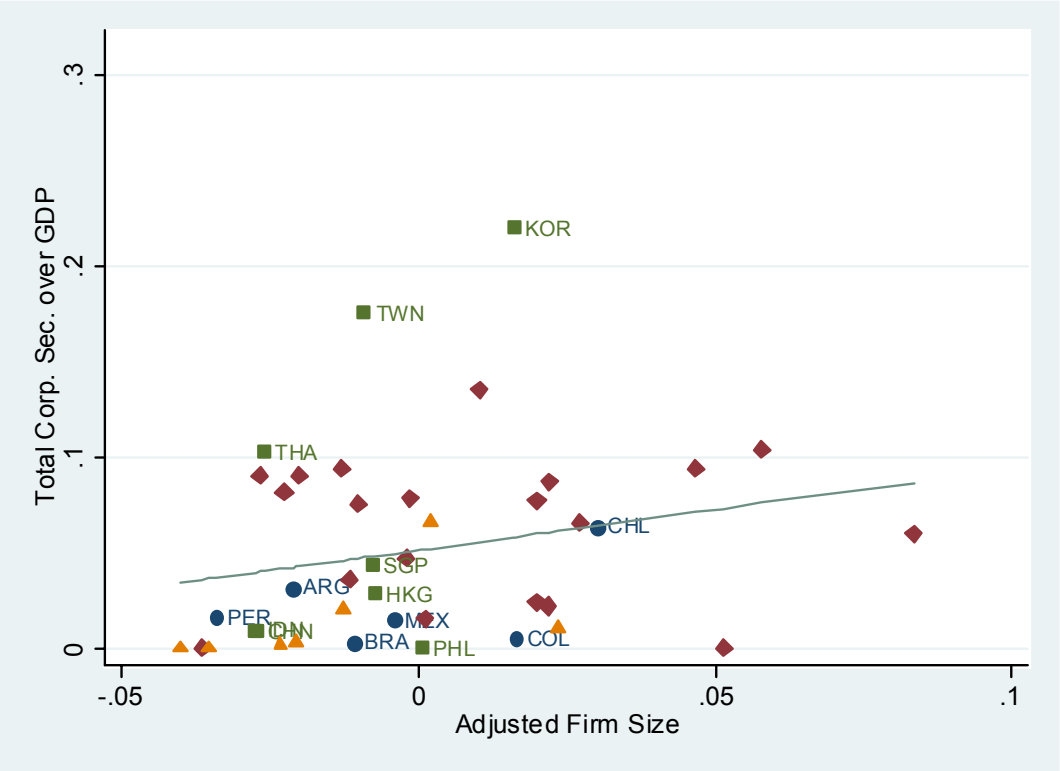
Source: Authors' calculations based on BIS and World Bank data

Figure 15. Corporate Bond Markets and the Size of the Economy



Source: Authors' calculations based on BIS and World Bank data

Figure 16. Corporate Bond Markets and the Firm Size



Source: Authors' calculations based on BIS and World Bank data

Figure 17. Corporate Bond Markets and the Firm Size

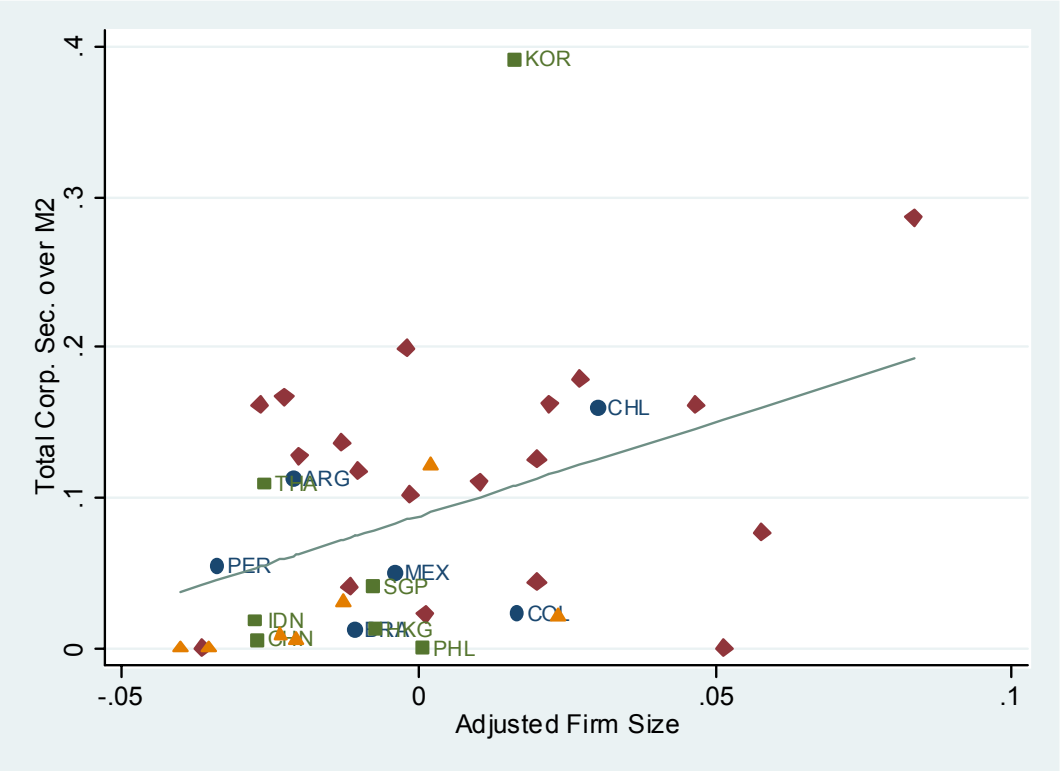


Figure 18. Total Savings and Bond Market Capitalization

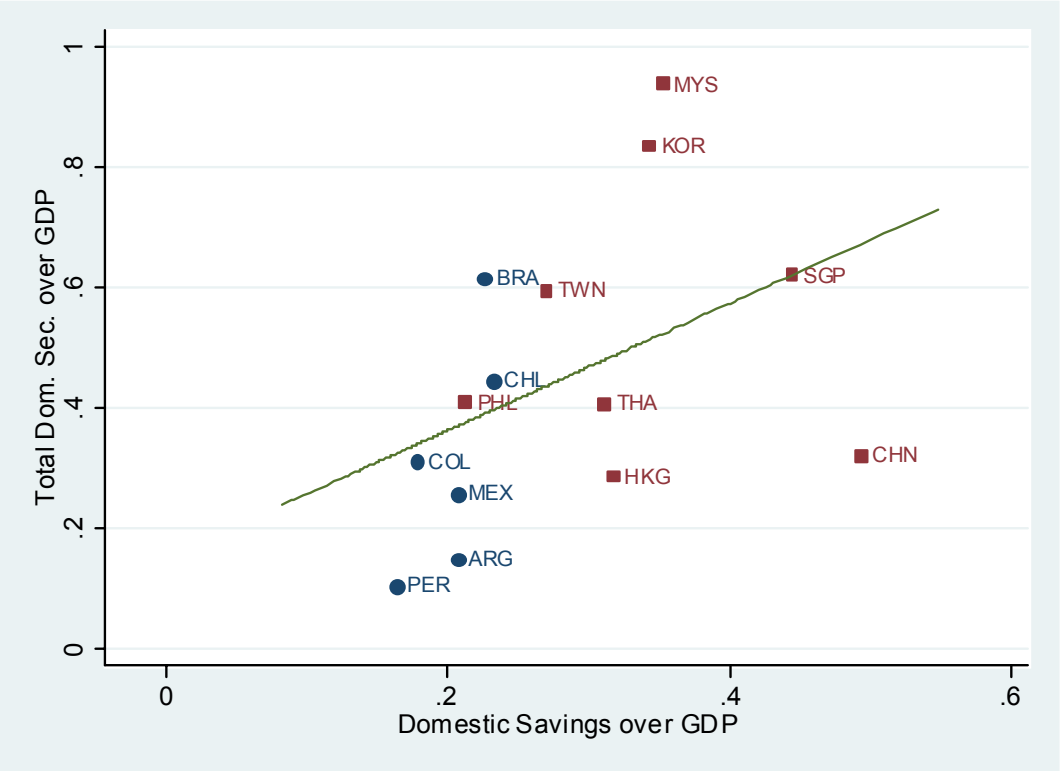


Figure 19. Private Savings and Bond Market Capitalization

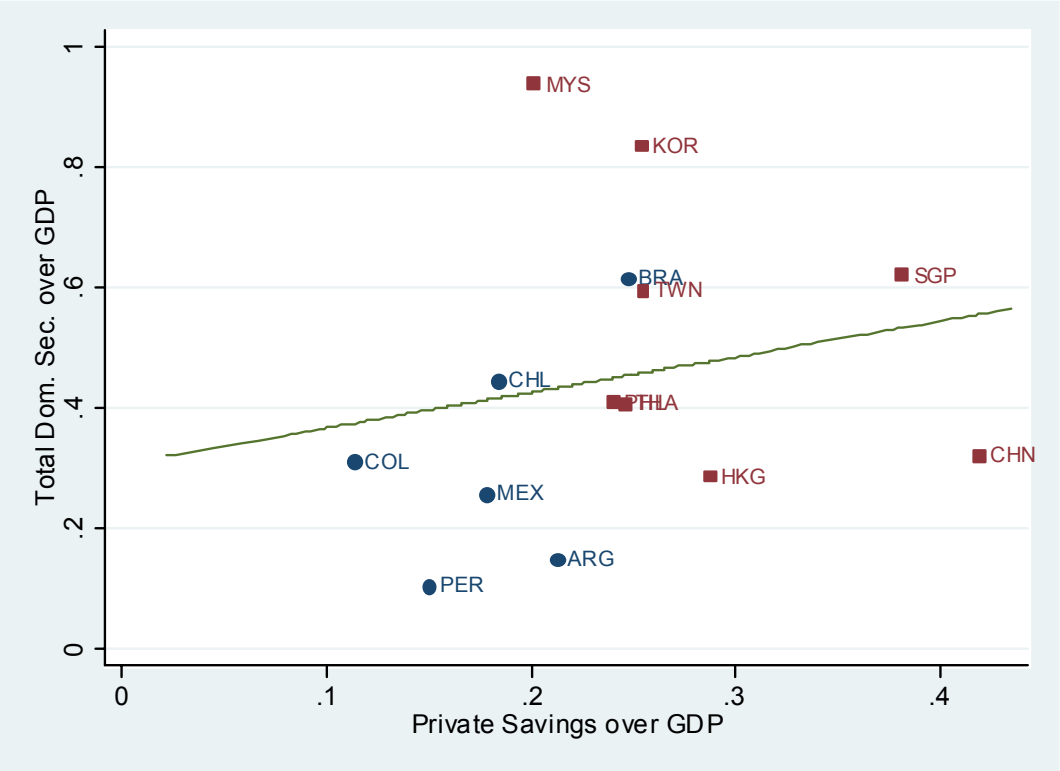


Figure 20: Corporate Bond Markets and Assets of Pension Funds

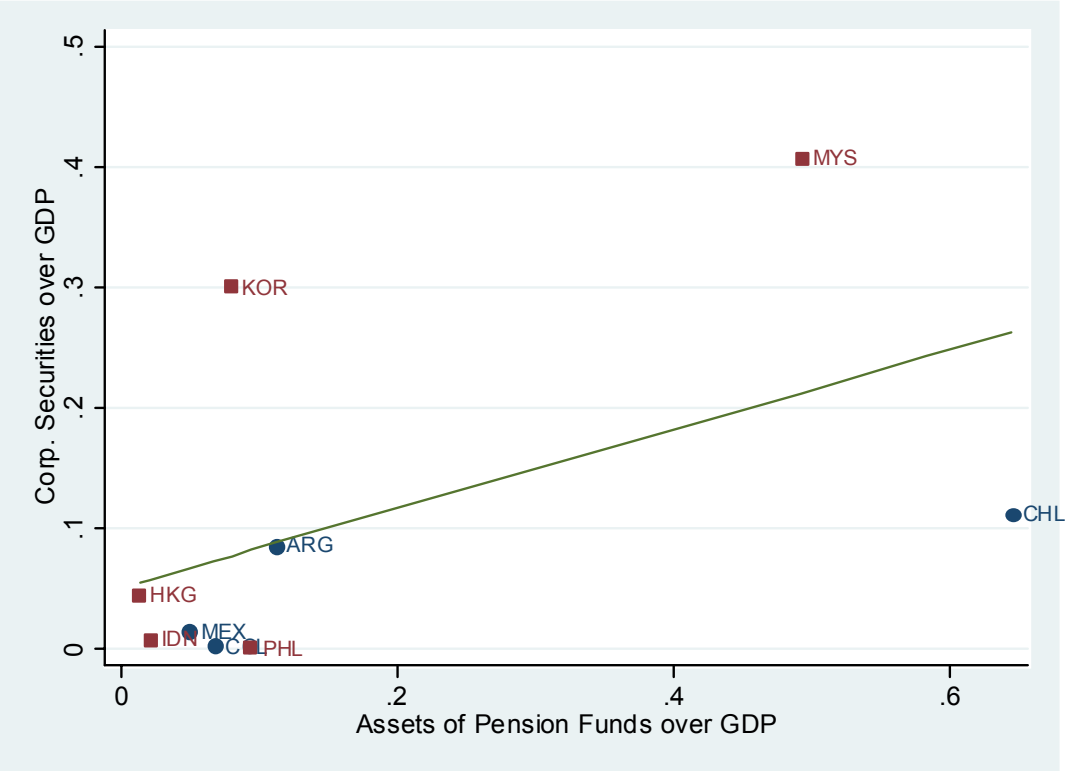


Figure 21: Corporate Bond Markets and Assets of Institutional Investors

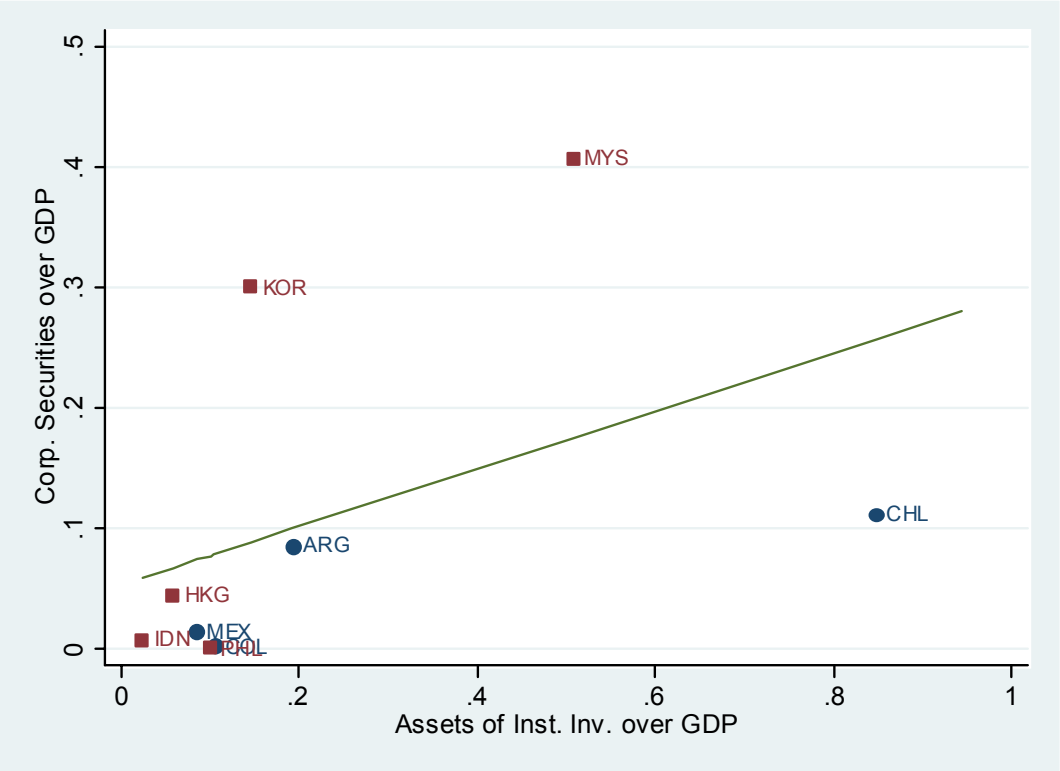
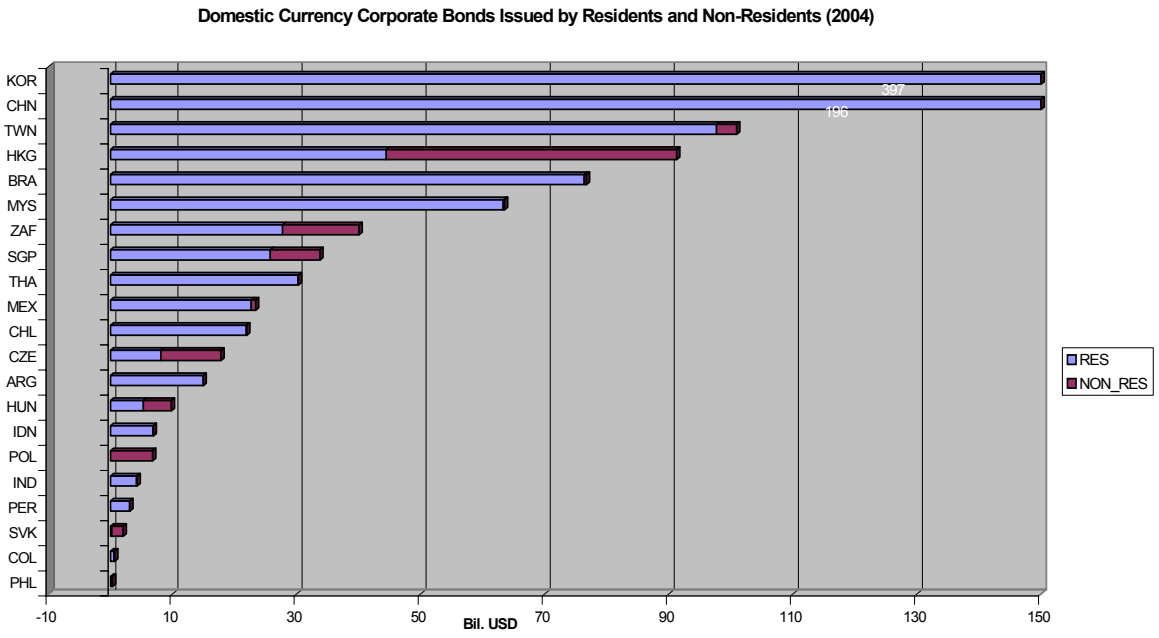
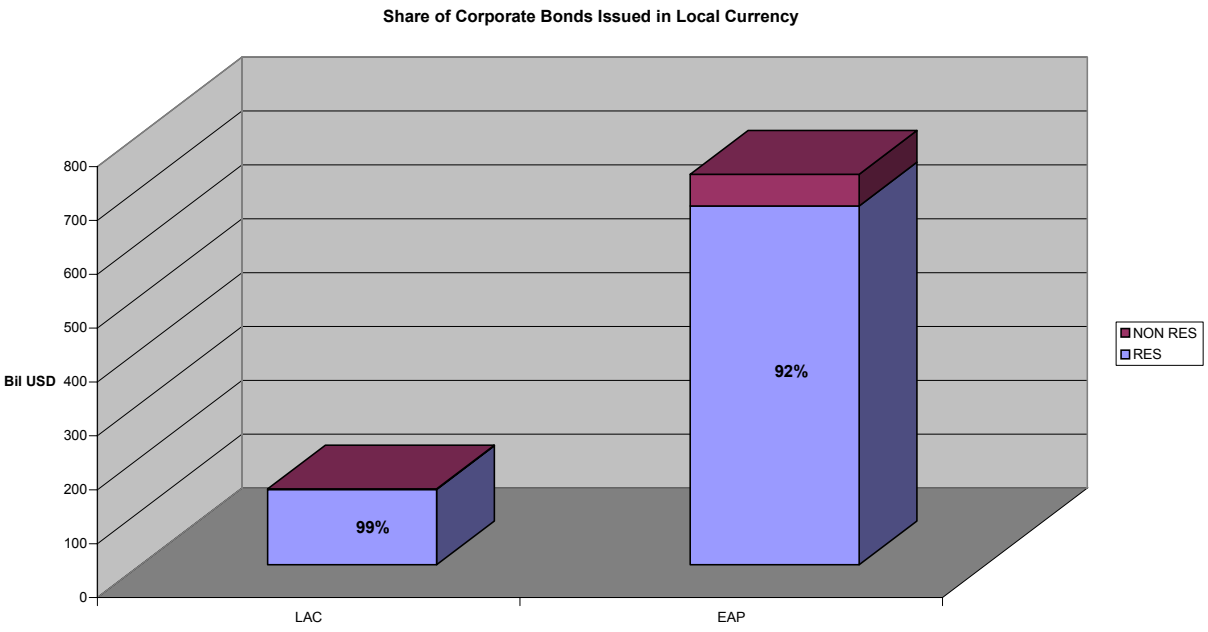


Figure 22



Includes bonds issued by Financila and Non-Financila Corporations, State Agencies and International Organizations. It assumes that all bonds issued domestically are issued by residents and are in Local Currency

Figure 23



Corporate bonds are defined as in Figure 22, EAP does not include China.

Figure 24

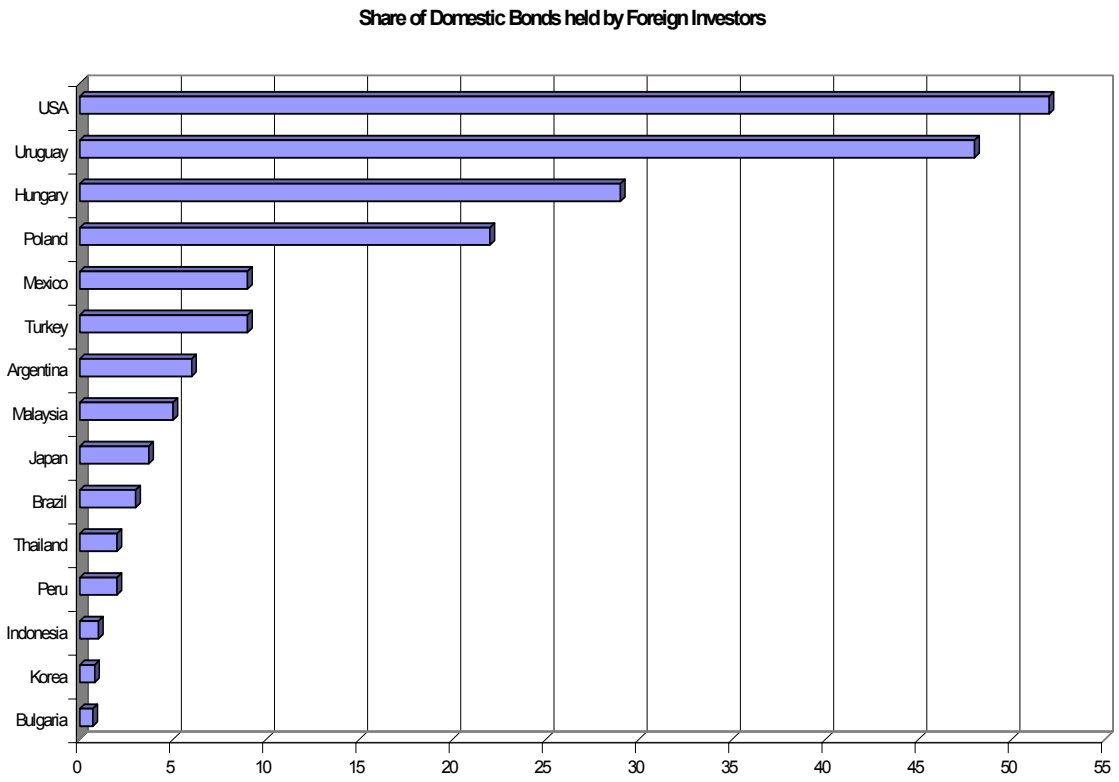

Share of Domestic Bonds held by Foreign Investors
USA
Uruguay
Hungary
Poland
Mexico
Turkey
Argentina
Malaysia
Japan
Brazil
Thailand
Peru
Indonesia
Korea
Bulgaria
0
5
10
15
20
25
30
35
40
45
50
55

Figure 25: Participation of Foreign Investors and Share of Bonds Issued in International Markets

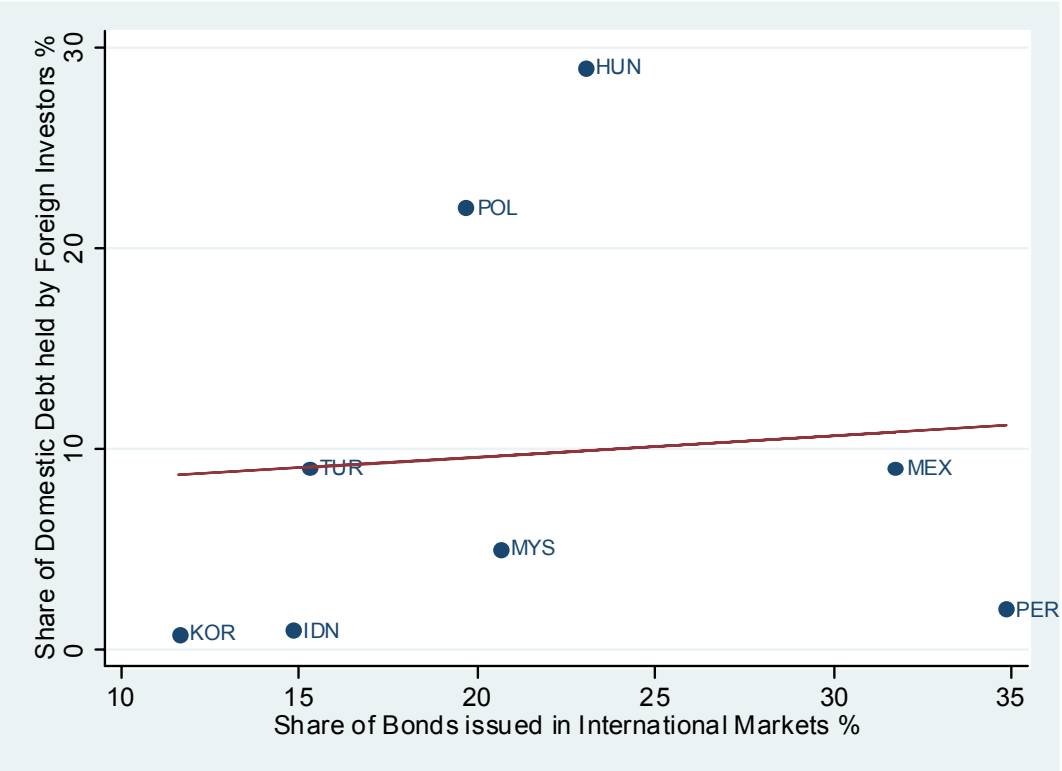
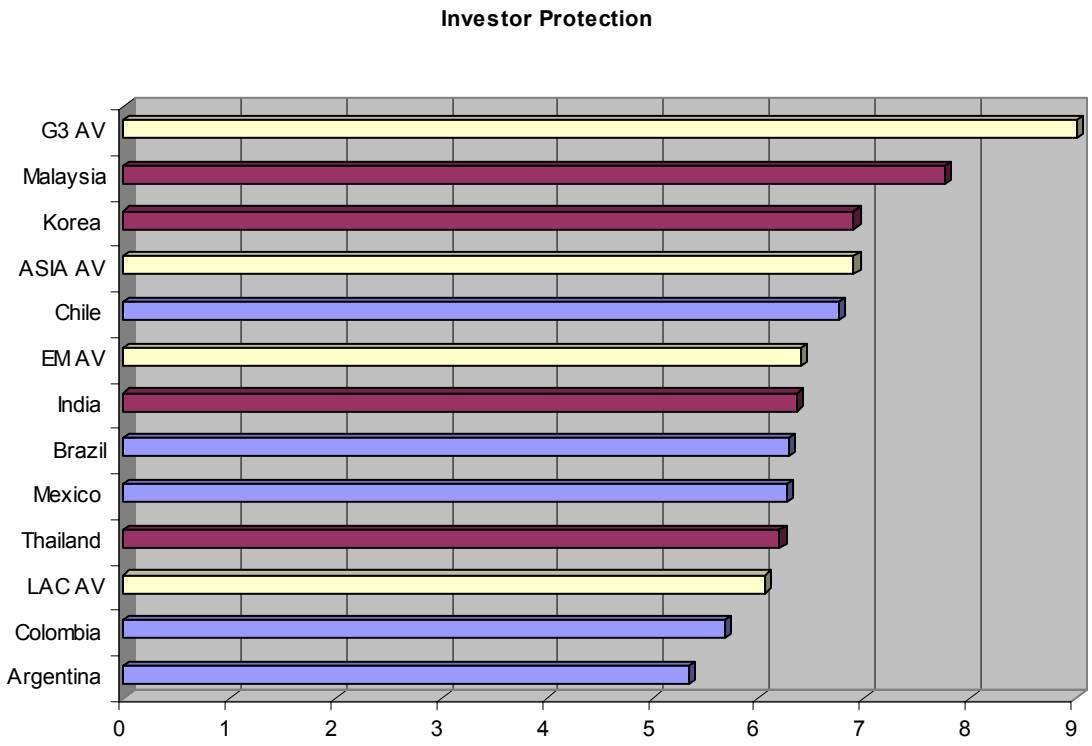
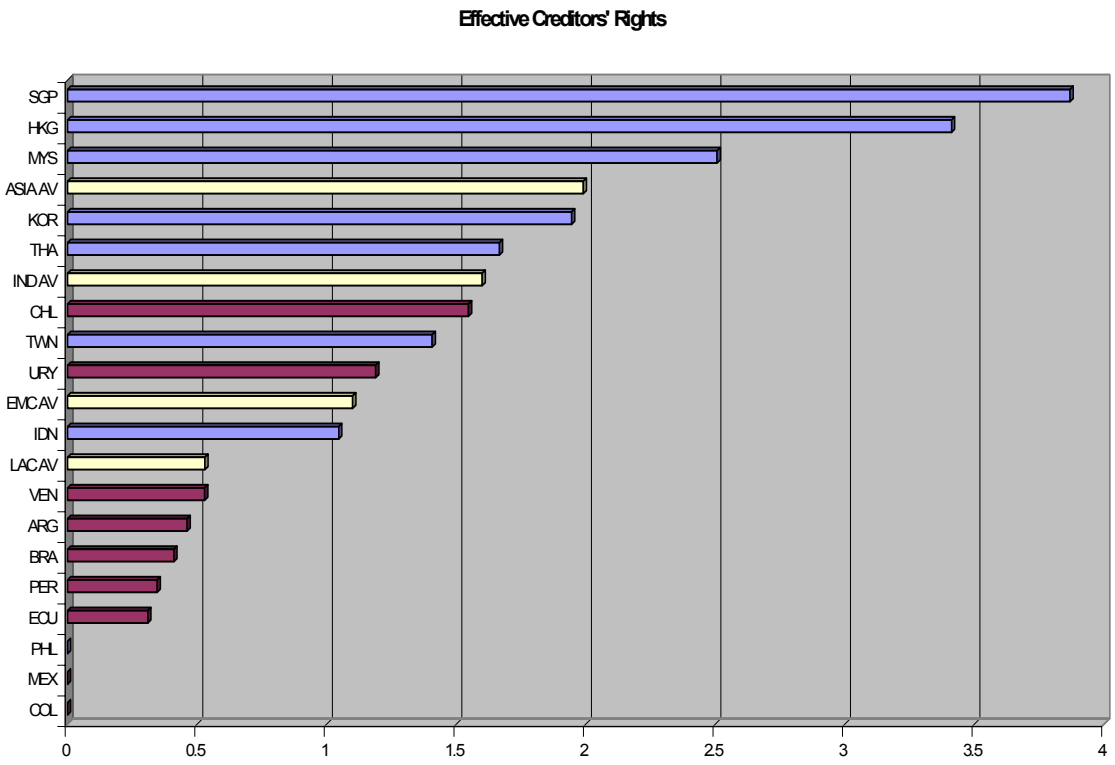


Figure 26



Source: IMF

Figure 27



Effective Creditor Rights are equal to Creditor Rights*Rule of Law. Creidtor rights are from La Porta et al. (1998) Rule of Law (rescaled to the 0-1 range) is from Kaufman et al.

Figure 28

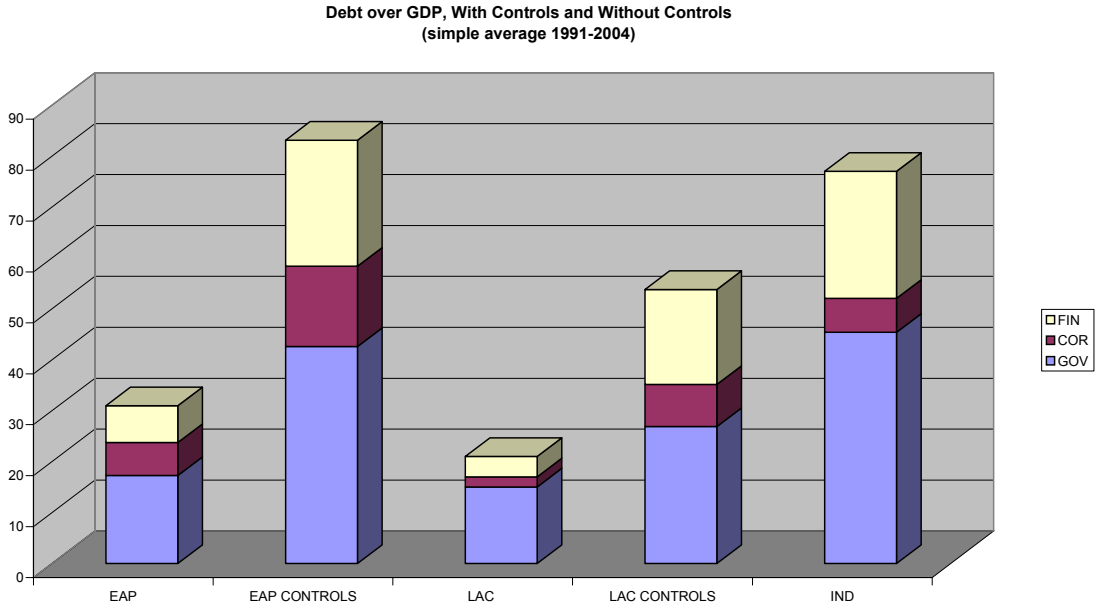

Debt over GDP, With Controls and Without Controls
(simple average 1991-2004)
90
80
70
60
50
40
30
20
10
0
EAP
EAP CONTROLS
LAC
LAC CONTROLS
IND
FIN
COR
GOV

Figure 29

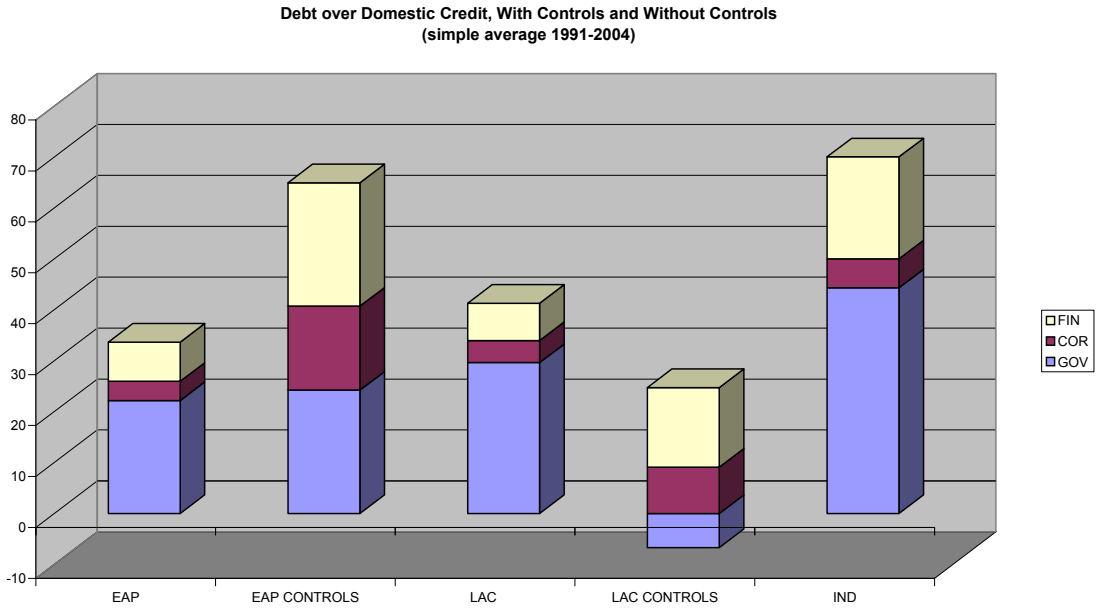

Debt over Domestic Credit, With Controls and Without Controls
(simple average 1991-2004)
80
70
60
50
40
30
20
10
0
-10
EAP
EAP CONTROLS
LAC
LAC CONTROLS
IND
FIN
COR
GOV

Table 1: The Determinants of the Size Government and Private Bond Markets Relative to GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	GBOND/GDP	PBOND/GDP	CBOND/GDP	FBOND/GDP	GBOND/GDP	PBOND/GDP	CBOND/GDP	FBOND/GDP
GDP	6.031	9.074	1.037	7.118	-1.740	5.511	1.038	3.893
	(6.04)***	(6.74)***	(2.05)**	(6.64)***	(0.71)	(4.25)***	(2.11)**	(4.73)***
GDP2	-0.470	0.040	0.032	-0.032	0.507	-0.663	-0.225	-0.321
	(5.14)***	(0.24)	(0.60)	(0.26)	(1.28)	(3.22)***	(2.88)***	(2.32)**
GDP_PC	1.192	1.626	0.499	1.499	2.389	1.527	1.125	-0.214
	(2.39)**	(4.24)***	(3.37)***	(5.26)***	(2.50)**	(3.27)***	(5.83)***	(1.00)
GDP_PC2	-0.017	-0.014	-0.004	-0.011	-0.117	-0.075	-0.056	0.015
	(1.70)*	(1.83)*	(1.47)	(1.70)*	(4.03)***	(4.16)***	(7.85)***	(2.02)**
EXP	0.114	0.188	0.038	0.135	0.173	0.163	0.060	0.041
	(2.78)***	(6.14)***	(3.12)***	(5.81)***	(2.88)***	(5.52)***	(4.48)***	(2.93)***
PRSAV	-6.543	5.657	2.121	2.274	-22.802	1.145	1.010	2.936
	(0.94)	(1.40)	(1.43)	(0.68)	(2.04)**	(0.26)	(0.50)	(1.47)
FIX	-0.415	-0.628	0.096	-0.502	2.101	0.665	0.105	0.145
	(0.74)	(1.68)*	(0.73)	(1.58)	(2.00)**	(1.29)	(0.45)	(0.63)
INTER	1.273	0.103	0.028	0.139	1.471	0.142	0.024	0.064
	(2.26)**	(0.36)	(0.24)	(0.57)	(1.90)*	(0.45)	(0.16)	(0.41)
IRATE	-0.169	-0.006	-0.007	-0.014	-0.103	0.011	0.010	-0.005
	(4.54)***	(0.41)	(0.87)	(1.11)	(2.37)**	(0.72)	(1.36)	(0.67)
SD_IRATE	-0.617	0.185	0.121	0.269	-0.837	-0.155	0.048	-0.185
	(5.77)***	(2.51)**	(3.20)***	(5.49)***	(4.84)***	(2.19)**	(1.70)*	(3.98)***
DOMCR	-3.061	10.032	0.014	7.738	-2.903	4.053	2.860	1.191
	(0.94)	(3.37)***	(0.01)	(3.14)***	(0.36)	(1.33)	(2.11)**	(0.82)
DOMCR2	-0.055	-3.251	0.180	-2.449	-2.935	-0.789	-0.889	-0.390
	(0.05)	(2.69)***	(0.48)	(2.50)**	(0.77)	(0.59)	(1.45)	(0.59)
CONC	-8.088	2.870	1.029	0.893	21.910	7.509	0.899	0.280
	(2.40)**	(1.10)	(1.07)	(0.40)	(2.82)***	(2.08)**	(0.62)	(0.16)
SPREAD	0.096	-0.143	0.082	-0.150	0.032	0.321	0.109	0.166
	(1.18)	(1.95)*	(3.69)***	(2.34)**	(0.11)	(1.14)	(0.99)	(0.89)
KAPCON	0.358	0.102	-0.067	-0.036	-0.124	0.037	0.121	-0.142
	(2.45)**	(1.03)	(1.46)	(0.43)	(0.43)	(0.34)	(2.19)**	(2.35)**
PUBLICDEBT	0.420	0.012	-0.003	0.022	0.209	-0.001	-0.001	-0.000
	(21.72)***	(0.99)	(0.60)	(2.25)**	(7.00)***	(0.14)	(0.20)	(0.05)
DEBT_KCON	0.044	0.001	-0.000	0.005	0.045	-0.004	-0.001	0.001
	(10.99)***	(0.52)	(0.34)	(2.63)***	(5.07)***	(1.34)	(1.00)	(0.78)
YR_PR	0.998	0.768	0.233	0.658	0.639	0.682	0.189	0.400
	(4.39)***	(6.35)***	(2.91)***	(5.99)***	(2.28)**	(6.00)***	(3.11)***	(5.90)***
RULEOFLAW	0.440	0.462	0.079	0.396	0.923	-0.233	0.088	0.045
	(0.98)	(1.78)*	(0.81)	(1.82)*	(1.38)	(0.79)	(0.74)	(0.32)
INVPROT	2.683	2.190	0.225	-0.612	3.663	3.255	0.642	2.255
	(4.32)***	(4.13)***	(0.96)	(1.36)	(3.26)***	(6.02)***	(2.59)***	(8.17)***
CONTR_COST	-0.287	-0.162	-0.112	-0.050	-0.377	-0.078	-0.021	-0.074
	(8.59)***	(6.40)***	(4.65)***	(2.44)**	(8.48)***	(3.59)***	(2.10)**	(5.40)***
FRENCHLAW	22.897	18.005	0.960	9.431	37.693	8.255	-1.498	8.446
	(7.38)***	(7.42)***	(1.21)	(4.34)***	(7.47)***	(3.84)***	(1.59)	(6.61)***
SOCLAW	3.200	-12.516	-2.735	1.104	16.920	2.996	-3.543	7.643
	(0.75)	(1.39)	(1.95)*	(0.40)	(2.88)***	(1.13)	(3.42)***	(4.52)***
GERSCANLAW	3.323	31.547	3.104	16.809	3.868	37.819	10.731	23.813
	(1.05)	(14.27)***	(3.09)***	(8.26)***	(0.63)	(12.04)***	(4.57)***	(15.33)***
LATITUDE	-13.811	-22.489	-2.497	-24.493	-11.238	-6.520	2.948	-16.726
	(1.81)*	(3.60)***	(1.23)	(4.81)***	(0.73)	(0.96)	(1.08)	(3.90)***
EAP	-2.846	10.691	9.120	-0.192	-26.465	-1.511	2.764	-3.412
	(0.59)	(4.09)***	(6.06)***	(0.09)	(5.21)***	(0.81)	(3.49)***	(3.34)***
LAC	-18.520	-5.281	1.555	-6.332	-50.892	-5.252	-1.179	-3.214
	(3.98)***	(2.07)**	(1.28)	(2.61)***	(6.99)***	(1.78)*	(0.91)	(2.58)**
ECA	5.036	21.265	2.206	-0.101	-29.595	-4.907	-2.408	-1.660
	(1.05)	(2.37)**	(1.43)	(0.04)	(3.76)***	(1.71)*	(1.86)*	(1.34)
OTH	20.512	13.806	6.021	8.790				
	(3.75)***	(4.64)***	(4.14)***	(5.22)***				
Constant	-10.051	-37.926	-5.627	-13.164	-0.112	-27.858	-8.987	-8.023
	(1.16)	(6.47)***	(2.15)**	(2.79)***	(0.01)	(5.26)***	(3.72)***	(2.76)***
Observations	491	479	483	476	222	222	214	222
Number of cc	43	43	43	42	21	21	21	21
F test: EAP=LAC	17.53	38.36	31.51	7.11	22.45	2.84	13.98	0.04
Prob > F	0.000	0.000	0.000	0.008	0.000	0.092	0.000	0.850

Absolute value of z statistics in parentheses. Estimation method: Generalized Least Squares with correction for heteroskedasticity and panel-specific autocorrelation. All regressions include year-fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 2: The Determinants of Government and Private Bond Markets relative to Domestic Credit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	GBOND/CR	PBOND/CR	CBOND/CR	FBOND/CR	GBOND/CR	PBOND/CR	CBOND/CR	FBOND/CR
GDP	6.540	7.963	0.264	3.977	-8.798	6.235	0.924	3.537
	(3.90)***	(7.10)***	(0.65)	(5.08)***	(1.85)*	(4.46)***	(1.73)*	(3.42)***
GDP2	-0.468	-0.810	0.017	-0.131	2.074	-0.754	-0.148	-0.348
	(3.11)***	(3.97)***	(0.41)	(1.40)	(3.04)***	(3.24)***	(1.69)*	(1.98)**
GDP_PC	-1.507	2.290	0.824	1.378	-1.610	1.618	1.249	-0.016
	(2.13)**	(6.88)***	(5.72)***	(6.00)***	(0.96)	(4.44)***	(7.13)***	(0.06)
GDP_PC2	0.026	-0.033	-0.010	-0.012	0.009	-0.084	-0.058	0.002
	(1.73)*	(4.52)***	(3.60)***	(2.44)**	(0.17)	(6.81)***	(9.83)***	(0.22)
EXP	0.153	0.203	0.028	0.086	-0.155	0.133	0.044	0.031
	(2.63)***	(5.55)***	(2.20)**	(4.43)***	(1.88)*	(5.42)***	(3.13)***	(1.63)
PRSAV	-21.599	1.949	2.782	3.225	-37.455	2.532	3.575	6.250
	(1.96)*	(0.40)	(1.68)*	(0.98)	(2.18)**	(0.61)	(1.73)*	(2.14)**
FIX	0.121	-0.627	0.240	-0.434	2.143	0.367	0.022	0.112
	(0.14)	(1.26)	(1.55)	(1.46)	(1.37)	(0.77)	(0.10)	(0.37)
INTER	2.347	0.367	0.152	0.158	4.136	0.501	0.201	0.300
	(2.74)***	(1.04)	(1.03)	(0.66)	(3.39)***	(1.71)*	(1.35)	(1.39)
IRATE	-0.211	-0.031	-0.019	-0.035	-0.112	-0.013	-0.009	-0.031
	(3.14)***	(1.41)	(2.14)**	(3.00)***	(1.63)	(0.90)	(1.25)	(2.88)***
SD_IRATE	-1.783	0.411	0.097	0.264	-3.249	-0.311	0.021	-0.216
	(8.69)***	(3.70)***	(1.93)*	(5.03)***	(10.11)***	(4.29)***	(0.66)	(3.88)***
DOMCR	-88.447	-4.119	-6.110	6.078	-112.036	-3.339	-0.747	-2.959
	(16.30)***	(1.35)	(7.03)***	(2.83)***	(8.55)***	(1.21)	(0.53)	(1.41)
DOMCR2	16.940	-2.689	1.173	-3.744	22.164	0.021	0.038	0.611
	(9.10)***	(2.53)**	(4.34)***	(4.27)***	(4.09)***	(0.02)	(0.06)	(0.65)
CONC	-11.272	2.455	2.351	1.558	46.972	10.043	3.744	1.205
	(2.14)**	(0.82)	(2.30)**	(0.83)	(3.90)***	(3.01)***	(2.48)**	(0.50)
SPREAD	-0.319	-0.097	0.010	-0.053	0.068	1.040	0.100	0.174
	(2.64)***	(1.61)	(0.68)	(1.20)	(0.16)	(2.77)***	(0.58)	(0.86)
KAPCON	0.341	-0.208	-0.048	-0.155	-0.131	0.244	0.293	-0.021
	(1.53)	(1.64)	(1.01)	(2.12)**	(0.25)	(2.34)**	(4.42)***	(0.26)
PUBLICDEBT	0.381	0.058	0.011	0.028	0.192	0.021	0.007	0.006
	(12.60)***	(4.18)***	(2.05)**	(2.91)***	(5.21)***	(2.13)**	(1.29)	(0.85)
DEBT_KCON	0.032	0.009	0.000	0.007	0.020	0.003	-0.001	0.001
	(5.57)***	(3.12)***	(0.28)	(3.58)***	(1.69)*	(1.07)	(0.51)	(0.70)
YR_PR	2.359	1.058	0.414	0.671	0.887	0.972	0.338	0.680
	(5.64)***	(7.53)***	(4.31)***	(7.43)***	(1.64)	(9.93)***	(5.24)***	(7.41)***
RULEOFLAW	-0.091	0.868	0.325	0.505	0.957	0.683	0.411	0.332
	(0.14)	(2.69)***	(2.98)***	(2.51)**	(0.96)	(2.48)**	(3.11)***	(1.67)*
INVPROT	1.441	1.040	0.166	0.945	10.429	3.703	0.370	2.483
	(1.34)	(1.64)	(0.78)	(2.69)***	(4.36)***	(7.76)***	(1.53)	(7.54)***
CONTR_COST	-0.632	-0.152	-0.082	-0.069	-1.072	-0.113	-0.025	-0.093
	(11.23)***	(5.29)***	(6.19)***	(4.40)***	(11.89)***	(5.30)***	(1.69)*	(5.24)***
FRENCHLAW	15.682	14.475	0.507	12.365	67.341	10.435	-1.172	9.470
	(3.33)***	(5.46)***	(0.66)	(8.49)***	(6.63)***	(5.39)***	(1.13)	(5.84)***
SOCLAW	-22.549	-1.158	-2.966	4.742	13.081	5.156	-3.896	9.349
	(0.89)	(0.36)	(2.29)**	(2.48)**	(1.01)	(1.91)*	(3.15)***	(4.11)***
GERSCANLAW	0.051	27.886	1.418	19.752	-3.071	55.035	0.000	31.810
	(0.01)	(10.50)***	(1.74)*	(9.46)***	(0.25)	(19.69)***	(.)	(13.10)***
LATITUDE	-11.260	2.078	-4.050	-10.331	-20.030	-18.358	1.196	-20.389
	(1.06)	(0.30)	(1.86)*	(2.28)**	(0.59)	(2.56)**	(0.37)	(3.49)***
EAP	-20.094	21.476	10.770	4.173	-2.294	-2.067	2.337	-3.810
	(3.09)***	(7.49)***	(5.85)***	(1.77)*	(0.25)	(1.17)	(2.71)***	(2.62)***
LAC	-51.113	-1.817	3.370	-4.387	-58.293	-1.626	-0.310	-3.240
	(7.10)***	(0.67)	(2.48)**	(2.31)**	(5.18)***	(0.67)	(0.25)	(1.86)*
ECA	10.891	-3.360	2.865	-2.628	16.284	-3.082	-1.755	-2.683
	(0.43)	(0.97)	(1.83)*	(1.17)	(1.12)	(1.23)	(1.36)	(1.43)
OTH	5.532	20.581	8.799	7.558				
	(0.81)	(6.27)***	(6.33)***	(3.76)***				
Constant	120.853	-36.258	-4.843	-23.310	64.501	-26.725	-7.888	-7.210
	(10.12)***	(5.24)***	(1.95)*	(5.20)***	(2.67)***	(5.48)***	(3.04)***	(1.79)*
Observations	491	473	469	469	222	222	203	222
Number of cc	43	42	42	42	21	21	20	21
F test: EAP=LAC	18.96	58.87	25.58	16.44	25.63	0.05	5.31	0.16
Prob > F	0.000	0.000	0.000	0.000	0.000	0.817	0.021	0.689

Absolute value of z statistics in parentheses. Estimation method: Generalized Least Squares with correction for heteroskedasticity and panel-specific autocorrelation. All regressions include year-fixed effects. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Differences in Differences Analysis: Full Sample

	(1)		(2)		(3)	
CORP	8.464		33.737			
	(1.23)		(4.94)***			
FINA	-25.273				-33.737	
	(3.69)***				(4.94)***	
GOVT			25.273		-8.464	
			(3.69)***		(1.23)	
	CORP	FIN	CORP	GOV	FIN	GOV
GDP	-2.697	2.394	-5.091	-2.394	5.091	2.697
	(1.75)*	(1.53)	(3.23)***	(1.53)	(3.23)***	(1.75)*
GDP2	0.470	0.504	-0.034	-0.504	0.034	-0.470
	(2.85)***	(2.90)***	(0.20)	(2.90)***	(0.20)	(2.85)***
GDP_PC	0.305	0.479	-0.174	-0.479	0.174	-0.305
	(0.81)	(1.28)	(0.47)	(1.28)	(0.47)	(0.81)
GDP_PC2	-0.008	-0.003	-0.005	0.003	0.005	0.008
	(0.84)	(0.32)	(0.51)	(0.32)	(0.51)	(0.84)
EXP	0.074	0.144	-0.070	-0.144	0.070	-0.074
	(1.69)*	(3.54)***	(1.61)	(3.54)***	(1.61)	(1.69)*
PRSAV	8.832	12.653	-3.821	-12.653	3.821	-8.832
	(0.74)	(1.06)	(0.32)	(1.06)	(0.32)	(0.74)
FIX	3.811	-2.856	6.667	2.856	-6.667	-3.811
	(2.46)**	(1.86)*	(4.30)***	(1.86)*	(4.30)***	(2.46)**
INT	3.057	0.556	2.501	-0.556	-2.501	-3.057
	(1.73)*	(0.32)	(1.43)	(0.32)	(1.43)	(1.73)*
IRATE	0.128	0.210	-0.082	-0.210	0.082	-0.128
	(2.02)**	(3.30)***	(1.29)	(3.30)***	(1.29)	(2.02)**
SD_IRATE	1.048	0.989	0.059	-0.989	-0.059	-1.048
	(7.41)***	(6.88)***	(0.41)	(6.88)***	(0.41)	(7.41)***
YR_PR	0.057	0.055	0.001	-0.055	-0.001	-0.057
	(0.22)	(0.21)	(0.00)	(0.21)	(0.00)	(0.22)
RULEOFLAW	0.730	1.643	-0.914	-1.643	0.914	-0.730
	(1.04)	(2.35)**	(1.31)	(2.35)**	(1.31)	(1.04)
INVPROT	-2.734	-1.809	-0.925	1.809	0.925	2.734
	(4.39)***	(2.88)***	(1.47)	(2.88)***	(1.47)	(4.39)***
CONTR_C	0.242	0.237	0.006	-0.237	-0.006	-0.242
	(5.17)***	(5.03)***	(0.12)	(5.03)***	(0.12)	(5.17)***
DOMCR	-8.324	8.918	-17.241	-8.918	17.241	8.324
	(1.78)*	(1.88)*	(3.64)***	(1.88)*	(3.64)***	(1.78)*
DOMCR2	2.580	-4.643	7.223	4.643	-7.223	-2.580
	(1.56)	(2.79)***	(4.34)***	(2.79)***	(4.34)***	(1.56)
CONC	4.502	2.307	2.195	-2.307	-2.195	-4.502
	(1.10)	(0.57)	(0.53)	(0.57)	(0.53)	(1.10)
SPREAD	0.076	-0.318	0.393	0.318	-0.393	-0.076
	(0.55)	(2.33)**	(2.86)***	(2.33)**	(2.86)***	(0.55)
LATITUDE	-11.959	-12.554	0.594	12.554	-0.594	11.959
	(1.78)*	(1.84)*	(0.09)	(1.84)*	(0.09)	(1.78)*
KAPCON	-0.794	-0.110	-0.684	0.110	0.684	0.794
	(3.13)***	(0.43)	(2.66)***	(0.43)	(2.66)***	(3.13)***
PUBLICDEBT	-0.538	-0.454	-0.084	0.454	0.084	0.538
	(24.04)***	(19.94)***	(3.70)***	(19.94)***	(3.70)***	(24.04)***
FRENCH	-16.735	-4.168	-12.567	4.168	12.567	16.735
	(5.99)***	(1.50)	(4.51)***	(1.50)	(4.51)***	(5.99)***
SOC	-7.265	-2.482	-4.783	2.482	4.783	7.265
	(2.08)**	(0.70)	(1.35)	(0.70)	(1.35)	(2.08)**
GERSCAN	2.209	28.218	-26.009	-28.218	26.009	-2.209
	(0.78)	(9.66)***	(8.88)***	(9.66)***	(8.88)***	(0.78)
Observations	1454		1454		1454	
R-squared	0.91		0.91		0.91	

Table 4: Differences in Differences Analysis: Emerging Market Countries

	(1)		(2)		(3)	
CORP	11.344		18.680			
	(0.95)		(1.57)			
FINA	-7.336				-18.680	
	(0.63)				(1.57)	
GOVT			7.336		-11.344	
			(0.63)		(0.95)	
	CORP	FIN	CORP	GOV	FIN	GOV
GDP	-5.092	-1.784	-3.308	1.784	3.308	5.092
	(1.60)	(0.59)	(1.04)	(0.59)	(1.04)	(1.60)
GDP2	1.192	0.919	0.273	-0.919	-0.273	-1.192
	(2.04)**	(1.64)	(0.47)	(1.64)	(0.47)	(2.04)**
GDP_PC	2.030	1.161	0.870	-1.161	-0.870	-2.030
	(3.08)***	(1.77)*	(1.33)	(1.77)*	(1.33)	(3.08)***
GDP_PC2	0.005	0.033	-0.028	-0.033	0.028	-0.005
	(0.18)	(1.12)	(0.89)	(1.12)	(0.89)	(0.18)
EXP	-0.127	-0.066	-0.061	0.066	0.061	0.127
	(1.87)*	(1.16)	(0.91)	(1.16)	(0.91)	(1.87)*
PRSAV	47.500	45.164	2.336	-45.164	-2.336	-47.500
	(2.76)***	(2.72)***	(0.14)	(2.72)***	(0.14)	(2.76)***
FIX	-4.162	-3.225	-0.938	3.225	0.938	4.162
	(1.83)*	(1.47)	(0.41)	(1.47)	(0.41)	(1.83)*
INT	0.086	1.320	-1.234	-1.320	1.234	-0.086
	(0.05)	(0.72)	(0.67)	(0.72)	(0.67)	(0.05)
IRATE	0.145	0.135	0.010	-0.135	-0.010	-0.145
	(2.33)**	(2.16)**	(0.16)	(2.16)**	(0.16)	(2.33)**
SD_IRATE	0.485	0.355	0.130	-0.355	-0.130	-0.485
	(2.43)**	(1.83)*	(0.65)	(1.83)*	(0.65)	(2.43)**
YR_PR	0.362	0.507	-0.145	-0.507	0.145	-0.362
	(1.21)	(1.70)*	(0.48)	(1.70)*	(0.48)	(1.21)
RULEOFLAW	3.589	3.587	0.003	-3.587	-0.003	-3.589
	(4.45)***	(4.54)***	(0.00)	(4.54)***	(0.00)	(4.45)***
INVPROT	-4.152	-1.839	-2.313	1.839	2.313	4.152
	(3.74)***	(1.70)*	(2.09)**	(1.70)*	(2.09)**	(3.74)***
CONTR_C	0.155	0.112	0.042	-0.112	-0.042	-0.155
	(3.23)***	(2.37)**	(0.89)	(2.37)**	(0.89)	(3.23)***
DOMCR	-34.384	-33.927	-0.458	33.927	0.458	34.384
	(3.28)***	(3.35)***	(0.04)	(3.35)***	(0.04)	(3.28)***
DOMCR2	9.911	8.800	1.111	-8.800	-1.111	-9.911
	(1.92)*	(1.75)*	(0.22)	(1.75)*	(0.22)	(1.92)*
CONC	23.348	24.408	-1.059	-24.408	1.059	-23.348
	(2.70)***	(3.06)***	(0.12)	(3.06)***	(0.12)	(2.70)***
SPREAD	-0.935	-0.538	-0.397	0.538	0.397	0.935
	(0.97)	(0.56)	(0.41)	(0.56)	(0.41)	(0.97)
LATITUDE	-79.392	-72.398	-6.994	72.398	6.994	79.392
	(7.19)***	(6.65)***	(0.65)	(6.65)***	(0.65)	(7.19)***
KAPCON	0.008	-0.285	0.294	0.285	-0.294	-0.008
	(0.02)	(0.73)	(0.76)	(0.73)	(0.76)	(0.02)
PUBLICDEBT	-0.240	-0.227	-0.013	0.227	0.013	0.240
	(8.48)***	(8.04)***	(0.46)	(8.04)***	(0.46)	(8.48)***
FRENCH	-22.545	-11.098	-11.447	11.098	11.447	22.545
	(4.58)***	(2.31)**	(2.33)**	(2.31)**	(2.33)**	(4.58)***
SOC	-1.598	4.720	-6.318	-4.720	6.318	1.598
	(0.36)	(1.07)	(1.42)	(1.07)	(1.42)	(0.36)
GERSCAN	18.779	26.613	-7.834	-26.613	7.834	-18.779
	(3.20)***	(4.73)***	(1.34)	(4.73)***	(1.34)	(3.20)***
Observations	662		662		662	
R-squared	0.89		0.89		0.89	