Draft—Comments Welcome

Global Financial Stability and Local Currency Bond Markets

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Abstract

One factor that arguably could have ameliorated both the emerging market crises of the 1990s and the current global crisis is the development of local currency bond markets. We document and discuss the recent surge in local bond market development, particularly evident in emerging economies where reliance on foreign currency debt—and its concomitant currency mismatches—has been substantially reduced. We also investigate the extent to which countries have been able to borrow internationally in their own currency and find that cross-border participation in local currency bonds is highest in countries where investor-friendly institutions and policies have been established.

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1. Introduction

There is a growing consensus among policymakers, academics, and market participants regarding the importance of local currency bond markets for financial stability. Global institutions, including the IMF, BIS, World Bank, and OECD, have highlighted the importance of local bond market development, and regional organizations such as the Asian Development Bank have championed the strategy.[1] Attention focused on local bond market development following a series of currency crises in emerging economies that revealed the financial fragility associated with a currency mismatch.

The development of local currency bond markets in emerging economies could contribute to global financial stability in a number of ways. First, by reducing reliance on foreign currency debt—and its concomitant currency mismatches—emerging economies would be less likely to repeat the experience of the Asian financial crisis (Goldstein and Turner 2004; Eichengreen and Hausmann 2005; Burger and Warnock 2006). Second, local bond markets play an important role in the broader goal of financial development which in turn is linked to economic growth and poverty reduction (Levine 2005, 2008). Third, the development of local currency bond markets has the potential to mitigate the global shortage of sound and liquid financial assets described by Caballero, Farhi, and Gourinchas (2008a,b), henceforth CFG.

The first two ways local currency bond markets in emerging economies could contribute to global financial stability are noncontroversial and well understood by academics, policy makers, and practitioners. The third way is worth expanding. Persistent global imbalances have attracted extensive analysis by academics and

[1] See, for example, BIS (2007), IMF (2006), Asian Bond Online (www.asianbondsonline.adb.org), and the World Bank Gemloc program (www.gemloc.org).

policymakers, and one school of thought emphasizes excessive borrowing by the US economy in generating these imbalances. But an alternative hypothesis puts focus on the saving side of the equation and describes a global savings glut (Bernanke 2005). Extending the focus on saving, CFG suggest that the root cause of these imbalances is a shortage of sound and liquid financial instruments to act as a store of value for growing global wealth. In CFG's model the Asian financial crisis dealt a damaging blow to financial development in emerging economies around the globe. The resulting lack of reliable financial instruments in emerging economies channeled global saving toward industrial countries and in particular the US. One potential path toward global financial balance would involve improved financial development in emerging markets that might attract cross-border investors from the developed and developing world alike.

Thus, local currency bond market development is potentially important to people who care about currency mismatches, growth and development, or global imbalances. We examine the recent evolution of bond markets and find, consistent with CFG's financial underdevelopment hypothesis, that emerging bond markets are still small relative to the developed world. But we also document significant progress on this front with a recent surge in local currency bond issuance and reduced reliance on foreign currency debt. We also analyze the extent to which countries can borrow internationally in their own currency. While data on international investment on local currency bonds is notoriously lacking, we use partial data from the US. We find that countries with investor-friendly institutions and policies—specifically, fewer capital controls, greater market liquidity and efficiency, stronger regulatory quality and creditor rights, better market infrastructure, lower taxation, and a larger local institutional investor base—

attract more U.S. investment. To the extent countries want to be able to borrow internationally in their currencies, these results point to concrete factors to be addressed in future financial development.

The paper proceeds as follows. In the next section we describe the development of local currency bond markets around the world and highlight major changes since 2001. In Section 3 we describe the returns characteristics of local currency bonds. In Section 4 we analyze U.S. participation in local bond markets as of end-2006. Section 5 concludes.

2. Local Currency Bond Market Development

The factors influencing local currency bond market development are well established in the academic literature. A number of studies have documented the importance of institutional factors and macroeconomic policies in fostering the development of debt markets (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997; Burger and Warnock 2006; Claessens, Klingebiel, and Schmukler 2007; Jeanne and Guscina 2006; Eichengreen and Luengnaruemitchai 2006; Mehl and Reynaud 2005). Burger and Warnock (2006) focus on the local currency bonds of at most 49 countries and find roles for both creditor-friendly policies and creditor-friendly laws. Countries with better historical inflation performance (an outcome of creditor-friendly policies) and stronger rule of law had more developed local bond markets, both private and government. Country size mattered in only some specifications. They also show that the necessary conditions for bond market development are very similar to those that foster development of the banking system. Countries in which people are not willing to become creditors—at one extreme this is an unwillingness to deposit money in banks—tend to

have undeveloped banking systems and underdeveloped bond markets. Finally, Burger and Warnock (2006) also separately analyze the size of government and private bonds markets and find that at least as a first pass their determinants are quite similar: Countries with better inflation performance and stronger rule of law have larger sovereign and corporate bond markets. This is not to say that the relationship between sovereign and corporate bond markets is identical across countries, as some countries with reasonably sized sovereign markets have exceedingly small corporate bond markets.

To evaluate the current state of bond market development we gathered data for 52 countries and display the amount of all bonds outstanding (Total) by country for 2006 in Table 1. Not surprisingly, most bonds are issued by developed countries (roughly $50 trillion outstanding at end-2006, compared to approximately $4.5 trillion for emerging economies). The table also shows various measures of the size of the local currency bond market. In the United States, Japan, and euro area (except Finland), local currency bond markets exceed annual GDP. Other industrial countries tend to have somewhat smaller local bond markets. Bonds issued by entities from developed countries are also almost exclusively in the local currency (as displayed in the final column of Table 1), although there are some exceptions. In contrast, emerging economies' local currency bond markets tend to be smaller (on average, about one-third of annual GDP) and make up a slightly smaller portion of those countries' overall bond markets. The relatively small size of bond markets in emerging economies can be interpreted as evidence of financial underdevelopment. Moreover, currency mismatches persist. For example, Iceland foreign-currency-denominated debt totals about 267% of GDP (local currency bonds are 403% of GDP and the amount of foreign currency bonds is 2/3 that of local bonds).

Table 2 shows the evolution of the size of local currency bond markets and their share of all bonds outstanding. Progress in emerging economies is evident by both indicators: Local currency bond markets have grown in size relative to GDP and emerging economies are now less reliant on foreign-currency-denominated bonds. Particularly impressive is the evolution of Latin America's bond markets, where in 2001 only half of the bonds were issued in local currency but by the end of 2006 over two-thirds were local-currency-denominated.

Importantly, the data in Table 2 suggest that emerging economies are not predestined to rely on foreign currency borrowing and do in fact have the capacity to develop local currency bond markets. Reduced currency mismatches should reduce the financial fragility of these emerging economies. In addition the growth of these bond markets has the potential to help address the shortage of global financial assets. One question is, to what extent are countries able to borrow internationally in their own currencies? To answer that we next describe the returns characteristics and then analyze cross-border holdings.

3. Returns Characteristics of Local Currency Bond Markets

In this section we present returns characteristics of local currency bonds viewed from the perspective of a U.S.-based investor from 2002 to 2006. One would suspect that returns characteristics over this period were very attractive, with inflation generally stable throughout the world and most currencies appreciating against the U.S. dollar. Not surprisingly, as Table 3 shows, over the January 2002–November 2006 period mean monthly U.S.-dollar returns were quite high in both industrial countries (0.81 percent per

month) and emerging markets (1.17 percent). This compares favorably both to the returns on U.S. bonds (0.43 percent) and to the near-zero returns on foreign bonds in the earlier, 1998–2001, period.

The higher returns on foreign bonds came with substantially more volatility than U.S. bond returns. The volatility comes from the fact that any unhedged foreign bond is a combined play on the local bond and the local currency. Currency returns are typically very volatile; this is evident in the table, as industrial country returns are three times as volatile as U.S. returns. Emerging market unhedged returns are also more volatile than U.S. returns, but note the dramatic reduction in volatility relative to the 1998–2001 period. Over the more recent period, the volatility in emerging market bonds has been tempered by improved macroeconomic stability and the ongoing exchange rate management. Clearly reduced volatility will be important if local currency emerging market bonds are to play a role in mitigating the global asset shortage, but this period of remarkable tranquility is unlikely to be permanent. It is important to note that hedged returns—for both industrial countries and emerging economies—have much less volatility (in any period). The development of currency hedging instruments in emerging economies may therefore be critical for further global integration of these local currency bond markets.

In Figure 1 we generate three efficient frontiers to illustrate the risk-return tradeoffs facing a U.S.-based fixed income investor.[2] Each frontier includes a range of portfolios varying from 100% U.S. bonds to 100% foreign bonds (labeled 'ROW'). The figure includes three measures of the rest-of-world (ROW) portfolio: (1) an *unhedged* portfolio of 80% industrial and 20% emerging market bonds, (2) a *hedged* portfolio of

[2] We ignore (but should not) the other assets in this investor's portfolio.

80% industrial and 20% emerging market bonds, and (3) a 50-50 combination of (1) and (2). The figure demonstrates that a U.S. investor taking an unhedged position in foreign bonds could have earned higher returns relative to U.S. bonds for this time period. The higher returns are sample-specific; recall from Table 5 that in the preceding period of dollar appreciation U.S. dollar returns on foreign bonds were near zero. The higher variance of unhedged foreign bond returns is not an artifact of this time period, thanks to the well-documented volatility of exchange rates. A portfolio of hedged foreign bonds offered significantly lower volatility with similar returns to an all-U.S. allocation. The final frontier illustrates the diversification benefits from a portfolio of hedged and unhedged foreign bonds. For this period a combination of hedged and unhedged bonds would have allowed U.S. investors to increase returns while also achieving lower variance relative to an all-U.S. allocation.

4. Foreign Participation in Local Currency Bonds

The previous sections have documented a period of local bond market development coupled with attractive returns. One way to evaluate whether local bond markets might play an important role in alleviating the global asset shortage is to analyze the participation of foreign investors. Cross-border investors provide a test to see if the recent development of local currency bond markets (particularly in emerging economies) has been associated with a greater ability to borrow internationally in the domestic currency.

Ideally, we would study all foreign investors' positions in local currency bonds, but unfortunately such a study is not currently possible. Although one broad multilateral

database does exist—namely the IMF's Coordinated Portfolio Investment Survey (CPIS) data—it does not include information about the currency denomination of bond holdings. What we can do is provide a formal analysis of the recently released 2006 benchmark survey of one large set of international investors—U.S. cross-border investors. The survey provides reliable evidence on the change in U.S. positions in local currency bonds since the last benchmark in 2001.

Previous benchmark surveys of U.S. investors reveal an overwhelming preference for bonds denominated in U.S. dollars. Burger and Warnock (2007), who analyze U.S. investors' end-2001 holdings of the local currency bonds of 41 countries, report nearly zero participation in local-currency bond markets in emerging economies and find a particular aversion to the most volatile markets. But, as highlighted in Section 2, there have been dramatic changes to local currency bond markets in the years since 2001. Emerging economies have greatly reduced their reliance on foreign currency debt and focused efforts on developing local currency bond markets. In addition, the returns characteristics reported in the previous section suggest opportunities for diversification along with particularly attractive returns for emerging market bonds (following poor returns in the late 1990s). We turn to evidence from the 2006 benchmark survey of U.S. investment abroad to analyze how U.S. investors have responded to these developments.

Table 4 displays December 2006 survey results for U.S. investment in local currency bonds, as well as results from the December 2001 survey. Participation figures are calculated as a percentage of local currency bonds outstanding. The 2006 survey reveals increased participation in emerging local currency bond markets. Participation is still very limited in Emerging Asia, at 0.21 percent (on average), but is up from near zero

in 2001 and is reasonably large in some countries such as Indonesia and Malaysia. U.S. participation in local-currency Latin American bonds has increased dramatically to a level of 2.03 percent by end-2006, double the share U.S. investors held of developed markets. In fact, for developed markets as a whole U.S. investors *decreased* their holdings as percentage of outstanding bonds. The survey therefore reveals a shift in U.S. investor portfolio weights away from developed countries toward emerging economies.

We next analyze the country-level factors that are associated with greater U.S. investment in local currency bond markets. CRISIL (2008) provides a good starting point. Somewhat similar to the country-level investability measures for equities devised in Edison and Warnock (2003), CRISIL has created investability scores for 20 local currency bond markets. In the CRISIL data, there are six components to investability: capital controls, market liquidity and efficiency, regulatory quality and creditor rights, market infrastructure, taxation on bonds, and the size of the local institutional investor base. Capital controls data are from the AREAER (2007) and score countries on three indicators that are particularly relevant from the perspective of investment in local currency bond market: access to securities market, access to domestic money market, and access to the derivatives market. The market liquidity and efficiency measure is formed by combining four variables: secondary market turnover ratio, bid-ask spread, existence of a yield curve, and existence of centralized bond price data. Regulatory quality and creditor rights are taken from the World Bank's Regulatory Quality Index (Worldwide Governance Indicators) and Creditor Rights Index (Doing Business). Market infrastructure indicators cover efficiency of clearing and settlement systems, safety and soundness of safekeeping arrangements, and efficiency of asset servicing. Effective tax

rates are from the perspective of a Luxembourg-based institutional investor. Finally, investor base is the size of institutional investor base (pension and mutual funds) as a share of GDP. For complete details, see CRISIL (2008).

The CRISIL investability data are available for the 20 Gemloc countries.[3] In addition, we added roughly 20 developed countries by creating similar indices. We started with the assumption that developed countries obtain the maximum score for each component and then altered those scores as we gathered information. For readily available data, such as capital controls and the components of regulatory quality and creditor rights, this task is straightforward. For an item such as market infrastructure we were not able to gather data, but here assuming the maximum score for developed markets seems particularly plausible.

Table 5 presents a series of Tobit regression results testing the ability of each of the investability indicators to explain U.S. cross-border participation in local currency bond markets. The dependent variable in each regression is the percentage of local currency bonds held by U.S. investors, as of end-2006.[4] The results indicate that countries with higher scores on the aggregate investability index are able to attract significantly more U.S. investment into local currency bond markets. In addition, all of the individual sub-indices of investability have a statistically significant impact on U.S. investor participation. Interpreted in light of the global asset shortage, these results establish a concrete set of policy settings and institutional factors which should foster further financial development and attract cross-border participation.

[3] The Gemloc Program -- or Global Emerging Markets Local Currency Bond Program -- supports the development of local currency bond markets in developing countries. We thank the Gemloc group for providing us with the underlying investability data.

[4] Colombia is excluded from this analysis (and hereafter) because, as displayed in Table 6, it represents an outlier in terms of the very large percentage of Colombian peso-denominated bonds held by U.S. investors.

The investability indicators were generated as a way of evaluating the eligibility of developing local currency bond markets for the Gemloc program. It is therefore of particular interest to see whether the indicators are able to explain U.S. investor participation among the twenty markets included in the launch of the GEMX index. Figure 2 displays that the relationship between CRISIL's investability index and U.S. investor positions as of end-2006 is positive and statistically significant.[5]

Having established that U.S. investors' cross-border bond positions were influenced by the institutional factors and policies embodied in the investability index, we next evaluate whether country specific returns characteristics can further explain investor behavior. The favorable returns for emerging economies discussed in Section 3 clearly contributed to the broad increase in participation by U.S. investors displayed in Table 4. But in our empirical tests we find no statistically significant relationship between the mean and/or variance of historical returns and US holdings.[6] The data are summarized in Figure 3 and indicate that U.S. investors did not discriminate *among* local currency bond markets based on the performance of past returns. Returns in local currency bond markets were generally favorable, prompting more U.S. investment (especially in emerging markets), but past returns characteristics did not appear to influence allocations among local bond markets.

[5] While all of the underlying subcomponents are positively related to U.S. investment in the Gemloc subsample, only a few—namely taxation and liquidity and efficiency—are significant. The lack of statistical significance for some indicators could, of course, be due to the limited number of observations in the GEMX subsample.

[6] Long time series of local currency bond returns are not available for a wide range of countries. However, because much of the movement in local currency bond returns owes to currency movements, as a proxy we formed variables measuring the mean, volatility, and skewness of monthly exchange rate changes measured over 5-, 10-, or 15-year periods ending December 2006. In a battery of unreported tests, we found no evidence that U.S. investors' 2006 international bond allocations were influenced by past returns characteristics.

6. Conclusion

The recovery of emerging economies from the string of crises in the late 1990s was remarkable in many ways, not least of which has been the development of local currency bond markets. After suffering the consequences of currency mismatches, many emerging economies have established the necessary institutional framework and pursued creditor-friendly policies in an effort to develop local bond markets. These efforts have borne fruit. In the period between 2001 and 2006 we document a substantial increase in local currency bond market development and a reduced reliance on foreign currency bonds. In fact, the most vulnerable area in 2001, Latin America, has made the most dramatic progress.

This study has focused on the response by cross-border investors to these developments in local currency bond markets. Unfortunately we lack a reliable international source for cross-border investment in local currency bonds. The most frequently cited source, the IMF's CPIS database, lacks information on the currency denomination of bond holdings. We therefore focus our attention on U.S. investors, for which a 2006 benchmark survey is available.

Our empirical results indicate that cross-border participation in local currency bonds is highest in countries where investor-friendly institutions and policies have been established. For emerging economies seeking to broaden their investor base by appealing to international investors, our results are potentially good news. Many of the factors that appeal to cross-border investors are within the control of the host country. It is not surprising that capital controls and taxation impede cross-border investment, but potential

host countries should also take note of the importance of regulatory quality and creditor rights.

There is cause for both optimism and caution when assessing the potential role of emerging local currency bond markets in mitigating the global asset shortage. On a promising note the 2001-2006 period witnessed a surge in local currency issuance by emerging economies *and* increased participation by cross-border investors. Our empirical results identify the importance of specific factors that international investors consider before taking a position in local currency bonds. These investability factors could form a blueprint for further development of local bond markets in emerging economies.

We must also be cautious in our assessment of emerging local bond markets. First, it is not our intention to suggest that larger bond markets (and more borrowing) by emerging economies should necessarily be encouraged. Rather, we seek to emphasize that local currency borrowing in emerging economies is possible and that under certain conditions has been demonstrated to be attractive to cross-border investors. Second, we must emphasize that the 2001-2006 period was a remarkably stable one in emerging economies and this period of tranquility has clearly come to an end. The current global financial crisis is generating significant stress in emerging economies and local currency bond markets have not been spared. Many emerging economies have suffered significant currency depreciations and there is anecdotal evidence of flight from local currency assets. The good news is that an increased share of local currency borrowing has reduced the instances of exploding foreign currency debt burdens during the current crisis.

However, it is far too early to evaluate the performance of local currency bond markets during the ongoing crisis.

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Table 1. Bond Market Development.
The table depicts data for 2006. Data on international bonds are from security-level data underlying BIS Quarterly Review Table 14B (International Bonds and Notes by Country of Residence). Local-currency-denominated debt is the sum of the long-term debt component of BIS Quarterly Review Table 16A (Domestic Debt Securities) and the local currency portion of Table 14B. Domestic debt for Egypt, Morocco, and Nigeria are from the World Bank. Israel's domestic debt is from Bank of Israel's 2006 Annual Report.

	Total	Local Currency Denominated		
	(USD billions)	(USD billions)	(% of GDP)	(% of total)
USA	**22,000**	**21,200**	**161**	**96**
Other industrial	**13,318**	**10,847**	**105**	**81**
Australia	610	321	42	53
Canada	1,079	835	65	77
Denmark	575	488	176	85
Iceland	110	66	403	60
Japan	6,964	6,898	158	99
New Zealand	33	19	18	57
Norway	216	112	33	52
Sweden	440	285	74	65
Switzerland	235	223	59	95
United Kingdom	3,057	1,601	67	52
Euro Area	**16,339**	**14,892**	**141**	**91**
Austria	520	428	133	82
Belgium	536	523	133	98
Finland	175	157	75	89
France	2,806	2,584	115	92
Germany	3,815	3,453	118	91
Greece	402	393	127	98
Ireland	705	522	237	74
Italy	3,142	3,050	164	97
Netherlands	2,027	1,635	244	81
Portugal	221	217	111	98
Spain	1,990	1,931	157	97

Table 1 (continued)

	Total (USD billions)	Local Currency Denominated (USD billions)	(% of GDP)	(% of total)
Emerging Markets	**4,498**	**3,734**	**33**	**83**
Egypt	15	13	12	85
Israel	106	92	75	87
Morocco	26	25	44	98
Nigeria	8	8	7	100
South Africa	112	102	40	90
EM Europe	**604**	**435**	**21**	**72**
Croatia	13	6	15	49
Czech Republic	48	42	29	87
Hungary	77	50	44	65
Poland	150	114	34	76
Russia	83	34	3	41
Slovakia	17	14	24	79
Turkey	215	174	45	81
Latin America	**791**	**529**	**20**	**67**
Argentina	128	64	30	50
Brazil	234	161	15	69
Chile	50	36	25	71
Colombia	23	8	6	36
Mexico	309	244	29	79
Peru	20	11	11	54
Venezuela	28	5	3	19
Asia	**2,647**	**2,436**	**43**	**92**
China	751	737	28	98
India	299	283	35	95
Indonesia	61	53	15	87
Malaysia	142	117	75	82
Pakistan	19	17	11	89
Philippines	63	31	27	50
South Korea	1,010	925	104	92
Taiwan, China	187	168	46	90
Thailand	115	105	51	92
Financial Centers				
Hong Kong SAR	71	38	20	53
Singapore	93	56	43	61

Table 2. The Evolution of Bond Market Development.
The table depicts data on local currency bond market development for 2001 and 2006. See Table 1 for details.

	Local Currency Denominated Bonds			
	% of GDP, 2001	**% of GDP, 2006**	**% of total, 2001**	**% of total, 2006**
United States	**136**	**161**	**98**	**97**
Other industrial	**85**	**105**	**87**	**81**
Australia	32	42	56	53
Canada	70	65	72	77
Denmark	152	176	89	85
Iceland	94	403	66	60
Japan	108	158	99	99
New Zealand	23	18	64	57
Norway	28	33	54	52
Sweden	60	74	62	65
Switzerland	62	59	97	95
United Kingdom	47	67	62	52
Euro Area	**99**	**141**	**90**	**91**
Austria	92	133	74	82
Belgium	132	133	97	98
Finland	51	75	76	89
France	87	115	91	92
Germany	97	118	92	91
Greece	88	127	90	98
Ireland	47	237	65	74
Italy	122	164	96	97
Netherlands	171	244	74	81
Portugal	69	111	90	98
Spain	63	157	93	97

Table 2 (continued)

	Local Currency Denominated Bonds			
	% of GDP, 2001	**% of GDP, 2006**	**% of total, 2001**	**% of total, 2006**
Emerging Markets	**28**	**33**	**75**	**83**
South Africa	34	40	87	90
EM Europe	**20**	**21**	**64**	**72**
Croatia		15	33	49
Czech Republic	15	29	85	87
Hungary	31	44	61	65
Poland	21	34	86	76
Russia	2	3	13	41
Slovakia		24	67	79
Turkey	48	45	78	81
Latin America	**18**	**20**	**51**	**67**
Argentina	14	30	29	50
Brazil	22	15	59	69
Chile	46	25	77	71
Colombia	6	6	30	36
Mexico	17	29	59	79
Peru	13	11	60	54
Venezuela	4	3	25	19
Asia	**37**	**43**	**90**	**92**
China	21	28	95	98
India	26	35	97	95
Indonesia	30	15	96	87
Malaysia	82	75	82	82
Pakistan	26	11	96	89
Philippines	22	27	48	50
South Korea	102	104	91	92
Taiwan, China	29	46	92	90
Thailand	30	51	81	92
Financial Centers				
Hong Kong SAR	15	20	55	53
Singapore	37	43	69	61

Table 3. Monthly US$ Returns of Local Currency Bonds, 2002 -- 2006

The table shows returns characteristics of local currency bonds. Returns are monthly, reported in U.S. dollars, and for the period January 2002 – November 2006. Industrial Countries refers to the JP Morgan GBI Global excluding U.S. Bond Index, which consists of the following 12 countries: Japan, Germany, France, Italy, UK, Spain, Belgium, Canada, Netherlands, Denmark, Sweden, Australia. Emerging Markets refers to the JP Morgan GBI-EM Broad Index, which consists of the following 16 countries: Brazil, Chile, Colombia, Czech Republic, Hungary, Indonesia, Malaysia, Mexico, Poland, Slovakia, South Africa, Thailand, Turkey, Russia, India, China. For the 1998-2001 period, local currency emerging market bond returns indices did not exist, so we calculated returns based on EMBI/JACI plus currency returns and averaged across 20 EMEs.

	Mean Return (%)	Variance	Skewness	Correlation with U.S. returns
U.S. Bonds	0.43	2.26	-0.59	1.00
Unhedged Foreign Bonds				
Industrial Countries	0.81	6.97	0.15	0.56
Emerging Markets	1.17	3.96	-0.25	0.27
Hedged Foreign Bonds				
Industrial Countries	0.39	0.61	-0.38	0.82
Emerging Markets	0.54	0.66	-0.23	0.47
Memo: Unhedged Foreign Bonds, 1998-2001				
U.S.	0.52	1.89	-0.21	1.00
Industrial Countries	0.11	6.10	0.08	0.49
Emerging Markets	-0.03	58.7	-0.94	0.12

Table 4. U.S. Participation in Local Currency Bond Markets

The table shows the percent of each country's local currency bonds held by U.S. investors as of end-2001 and end-2006. Data are from author's calculations using data on U.S. investment from Treasury Department et al. (2002, 2007) and the size of local currency bond markets (mostly from BIS; see Table 1 for details).

	2001	2006
Emerging Markets	**0.14**	**0.69**
South Africa	1.17	1.03
EM Europe	**0.51**	**1.09**
Croatia	0.00	0.00
Czech Republic	0.11	0.02
Hungary	1.07	1.24
Poland	1.46	3.35
Russia	0.08	0.05
Slovakia	0.00	1.78
Turkey	0.00	0.01
Latin America	**0.15**	**2.03**
Argentina	0.20	3.73
Brazil	0.07	2.93
Chile	0.04	0.00
Colombia	0.00	17.63
Mexico	0.26	0.85
Peru	0.00	0.54
Venezuela	0.26	0.90
Asia	**0.04**	**0.21**
China	0.00	0.00
India	0.00	0.00
Indonesia	0.01	2.04
Malaysia	0.02	0.90
Pakistan	0.00	0.00
Philippines	0.05	0.14
South Korea	0.06	0.25
Taiwan, China	0.14	0.00
Thailand	0.08	0.55
Financial Centers	**0.20**	**2.90**
Hong Kong SAR	0.29	0.65
Singapore	0.13	4.42

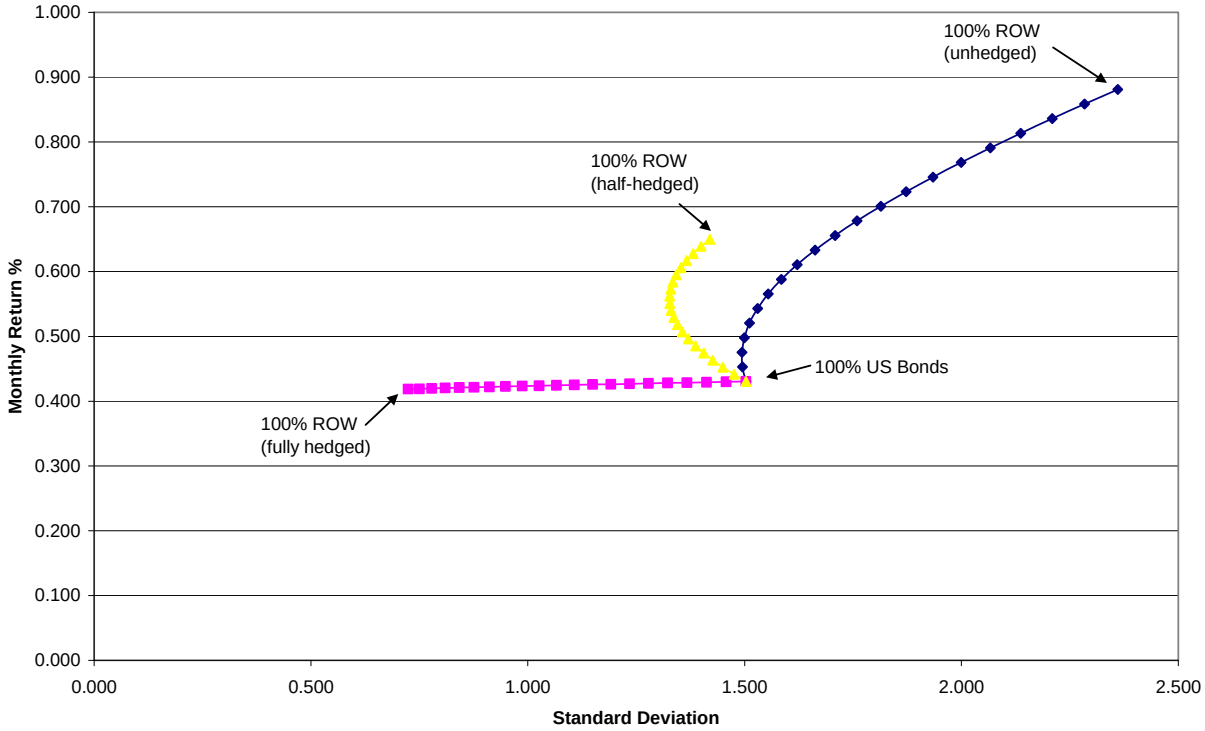
	2001	2006
Industrial Countries	**1.20**	**0.94**
Other industrial	**1.06**	**1.25**
Australia	2.84	1.93
Canada	4.38	4.79
Denmark	0.93	1.71
Iceland	0.00	0.51
Japan	0.48	0.57
New Zealand	11.20	9.37
Norway	0.89	1.84
Sweden	2.93	2.25
Switzerland	0.07	0.11
United Kingdom	2.01	1.90
Euro Area	**1.35**	**0.71**
Austria	0.43	0.28
Belgium	0.91	0.64
Finland	0.92	0.59
France	1.29	1.16
Germany	2.12	1.12
Greece	1.33	0.29
Ireland	1.01	1.13
Italy	0.72	0.20
Netherlands	1.19	0.87
Portugal	0.22	0.14
Spain	1.56	0.19

Table 5. Regressions of U.S. Holdings of Local Currency Bonds

The table shows Tobit regressions of the share (from 0 to 1) of local currency bonds held by U.S. investors on various investability indicators. Investability ranges from 0 to 1, with a value of 1 indicating the market is completely open to foreign investment. Regressions include all countries listed in Table 6 except those for which we do not have investability data (Argentina, Croatia, Czech Republic, Iceland, Israel, Korea, Pakistan, Taiwan, and Venezuela) and Colombia (an extreme outlier). Dropping another outlier (New Zealand) would increase the statistical significance of each variable. T-statistics based on robust standard errors are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

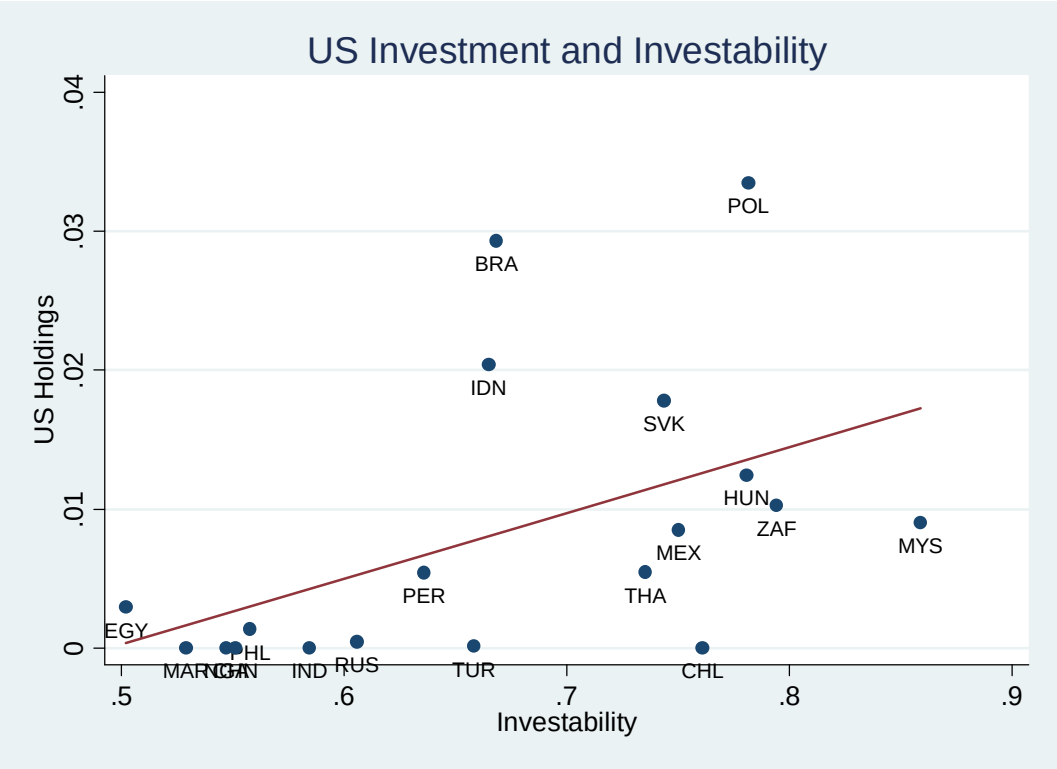
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Investability	0.046**						
	(2.55)						
Capital Account Openness		0.126**					
		(2.34)					
Liquidity_Efficiency			0.158**				
			(2.40)				
RegQuality_CRights				0.315**			
				(2.49)			
Market Structure					0.189**		
					(2.05)		
Taxation						0.241**	
						(2.43)	
Domestic Investor Base							0.242**
							(2.15)
Observations	39	39	39	41	39	39	39

Figure 2: US - ROW Bond Portfolios
2002 - 2006



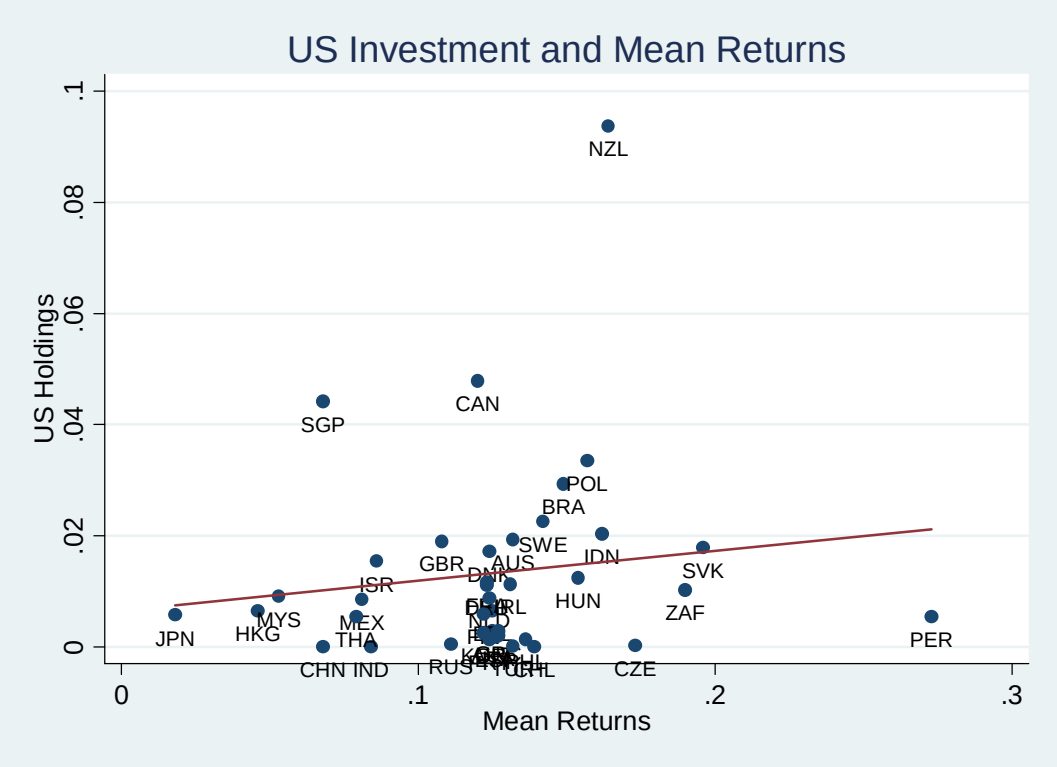
Note. Each frontier includes a range of portfolios varying from 100% U.S. bonds to 100% foreign bonds (labeled 'ROW'). The figure includes three definitions for the rest-of-world (ROW) portfolio: (1) an *unhedged* portfolio of 80% industrial and 20% emerging market bonds, (2) a *hedged* portfolio of 80% industrial and 20% emerging market bonds, and (3) a 50-50 combination of (1) and (2). Returns data are from January 2002 to November 2006.

Figure 2. U.S. Investment and Investability Index, GEMX Countries



Note. U.S. Holdings is the portion of the country's outstanding bonds that is held by U.S. investors; bond holdings data are as of end-2006 from Treasury Department et al. (2007). Investability for GEMX countries is from CRISIL (2008) and is comprised of the following six components: capital controls, market liquidity and efficiency, regulatory quality and creditor rights, market infrastructure, taxation on bonds, and the size of the local institutional investor base. The R^2 of the regression line is 0.24.

Figure 3. U.S. Investment and Past Returns



Note. U.S. Holdings is the portion of the country's outstanding bonds that is held by U.S. investors; bond holdings data are as of end-2006 from Treasury Department et al. (2007). Mean annual USD returns (in decimal form) are on unhedged local currency bonds (mostly from JPMorgan's GBI indices) from January 2002 to December 2006. The R^2 of the regression line is 0.02.