



# Impact of Macroeconomic, Political, and Institutional Factors on the Structure of Government Debt in the EM Countries

Anastasia Guscina

# Motivation

- Debt crises of the 1990s brought an increasing attention to the structure of government debt
  - Tesobono crisis in Mexico, GKO crisis in Russia involved domestically issued debt
  - Structure of government debt (external and domestic) not just its level has important implications for probability and severity of debt crises
- Need for a comprehensive approach that would look at the structure of government external and domestic debt

# Related literature

- “Debt intolerance” – Reinhart, Rogoff, and Savastano (2003)
- Balance sheet factors in external crises - Krugman (1999), Aghion, Bacchetta, and Banerjee (2002), Jeanne (2002)
- Maturity structure of external debt
  - Short-term debt as commitment – Calvo (1988), Blanchard and Missale (1994), Rodrik and Velasco (1999), and Jeanne (2000)
  - Short-term debt due to high term premia on LT debt – Broner, Lorenzoni, and Schmukler (2004)
- Currency composition
  - “original sin” – Eichengreen and Hausman (1999), Eichengreen, Hausmann and Panizza (2003)
  - Claessens, Klingebiel, and Schmukler (2004) – currency composition of government bonds

# Contributions of the paper

- It takes a comprehensive view on the structure of government debt in terms of place of issuance, maturity, currency of denomination and indexation, and interest rate structure
- It integrates and expands prior empirical analysis by looking at macroeconomic, political and institutional factors that determine:
  - Place of issuance of government debt
  - Tradability of domestic and international debt
  - Maturity structure of domestic debt
  - Currency composition of domestic debt
  - Indexation of domestic debt
- It raises many important questions that can be addressed by future theoretical research and country studies.

# Important findings – a preview

- The structure of international debt is largely a result of practices of the international financial sectors.
- The structure of domestic debt is shaped by macroeconomic and political conditions, and quality of institutions. **Government has more influence on the structure of domestic government debt.**
- “Domestic original sin” is on the way out partly as a result of successful macroeconomic stabilization policies that brought inflation under control.

# Empirical model

$$Y_{it} = \varphi Y_{it-1} + \beta X_{it} + \alpha_i + u_{it}, \quad i=1, \dots, N, t=1, \dots, T$$

Can be estimated in first differences:

$$Y_{it} - Y_{it-1} = \varphi(Y_{it-1} - Y_{it-2}) + \beta(X_{it} - X_{it-1}) + (\alpha_i - \alpha_i) + (u_{it} - u_{it-1})$$

$$\Delta Y_{it} = \varphi \Delta Y_{it-1} + \beta \Delta X_{it} + u_{it}$$

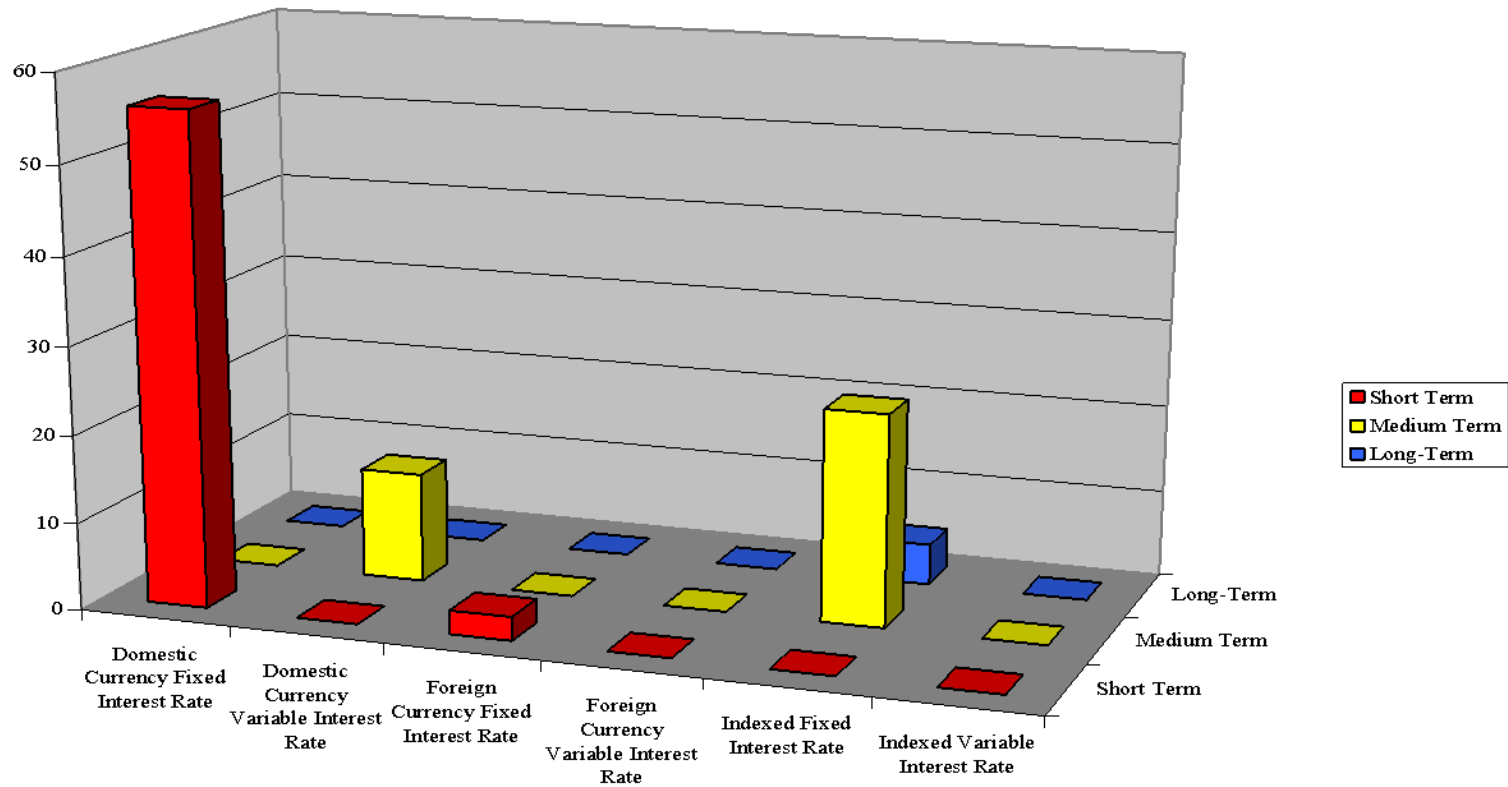
*If there is no serial correlation,  $Y_{it-2}$  and  $\Delta Y_{it-2}$  would be suitable instruments because they are correlated with  $Y_{it-1}$  and  $\Delta Y_{it-1}$ , but uncorrelated with  $u_{it}$ .*



# Data

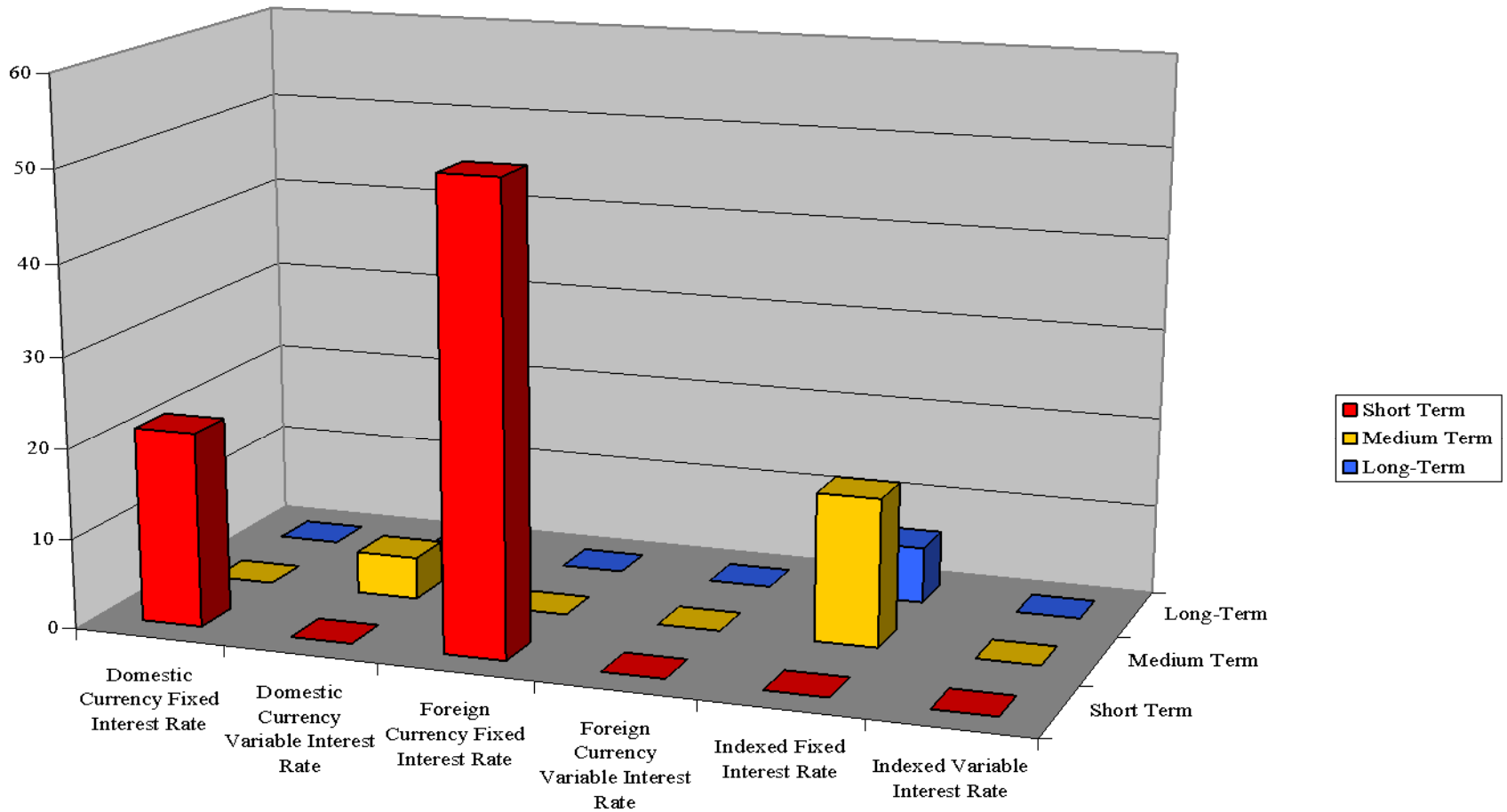
- Jeanne-Guscina EM Debt Database (2006)
- ICRG Database
- World Development Indicators (WDI)
- International Finance Statistics (IFS)

# Mexico: Structure of Domestic Government Debt - 1993





# Mexico: Structure of Domestic Government Debt - 1994



# Dependent Variables

- Share of domestic debt in total debt ( $S_D$ )
- Share of traded debt in domestic debt ( $S_{TD}$ )
- Share of DLTF debt in domestic debt ( $S_{DLTF}$ )
- Share of short-term debt in domestic debt ( $S_{ST}$ )
- Share of foreign-currency debt in domestic debt ( $S_{FX}$ )
- *Share of CPI-indexed debt in domestic debt ( $S_{CPI}$ )*
- *Share of floating rate debt in domestic debt ( $S_{FLOAT}$ )*

# Explanatory Variables

## *Financial Development and Openness Proxies:*

- M2 to GDP ratio (*M2\_GDP*)
- Stock market total value traded to GDP ratio (*StkMktVal*)
- Private credit to banks to GDP ratio (*PrCrBOF*)
- Private savings rate to GDP ratio (*PrSavRate\_GDP*)
- Trade to GDP ratio (*Trade\_GDP*)

# Explanatory Variables

*Macroeconomic Stability/Credibility Proxies:*

- Log of CPI-based inflation
- Real exchange rate volatility - (std. deviation) over the last 5 years (*reratevolatility\_5y*)
- Exchange rate stability index (*ErateStability*)

# Explanatory Variables

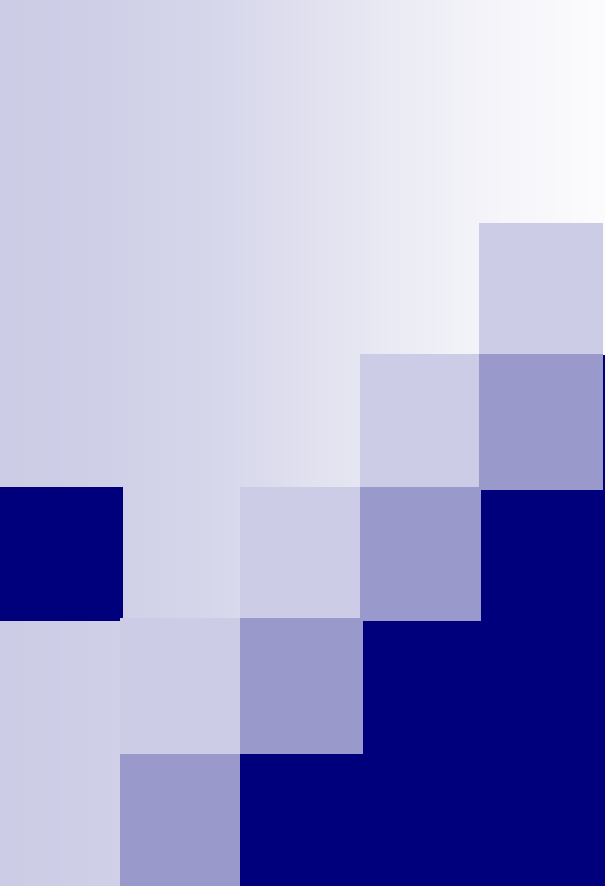
*Institutional Quality and Political Stability*

*Proxies:*

- Quality of Bureaucracy (*QBureaucracy*)
- Political Risk Rating (*PoliticalStability*)

# Priors

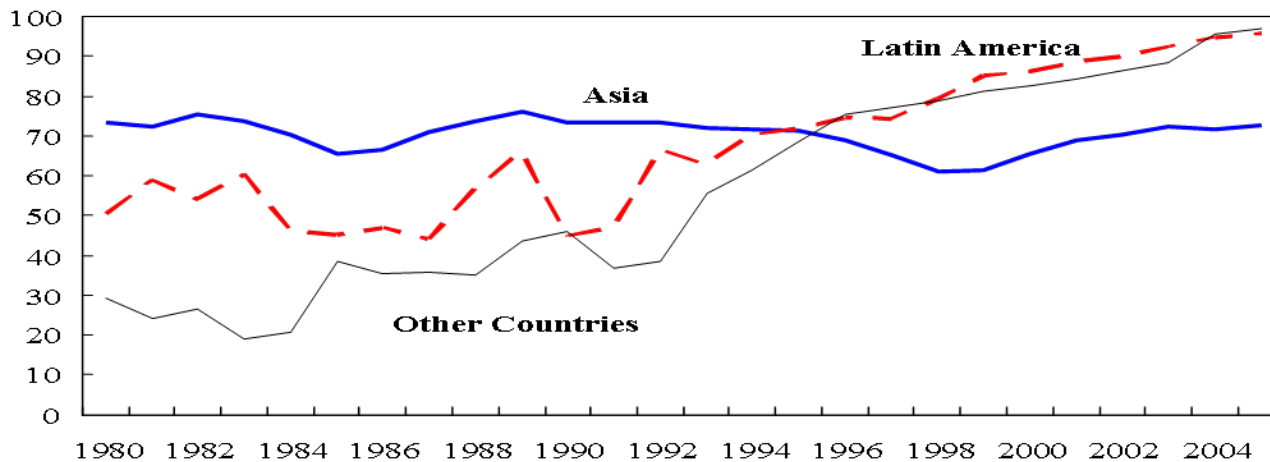
	$\pi$	$\sigma_{RER}$	M2_GDP	PrSavRate	StkMktCap	StkMktVal	PrCrBOF	trade_gdp	PoliticalStability	Qbureaucracy
S <sub>D</sub>	-	?	+	+	+	+	+	?	+	+
S <sub>TD</sub>	-	-	?	+	+	+	+	+	+	+
S <sub>TE</sub>	-	-	+	+	+	+	+	+	+	+
S <sub>DLTF</sub>	-	?	+	+	+	+	+	-	+	+
S <sub>ST</sub>	+	+	-	-	-	-	-	?	-	-
S <sub>FX</sub>	+	+	-	-	-	-	-	+	-	-



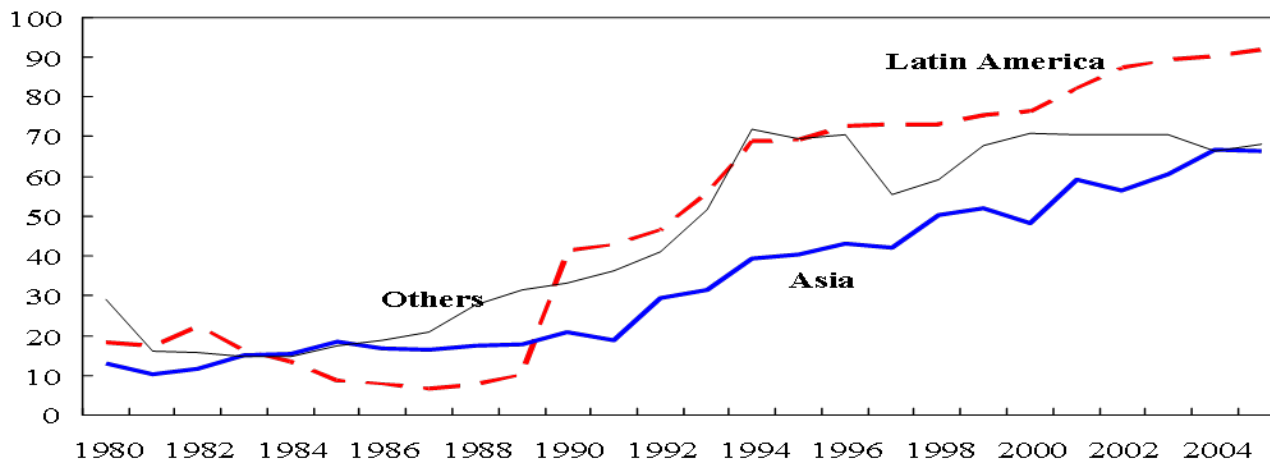
# **STYLIZED FACTS ON THE EVOLUTION OF GOVERNMENT DEBT**

# Increased Tradability of Sovereign Debt

Share of Traded Debt in Domestic Debt

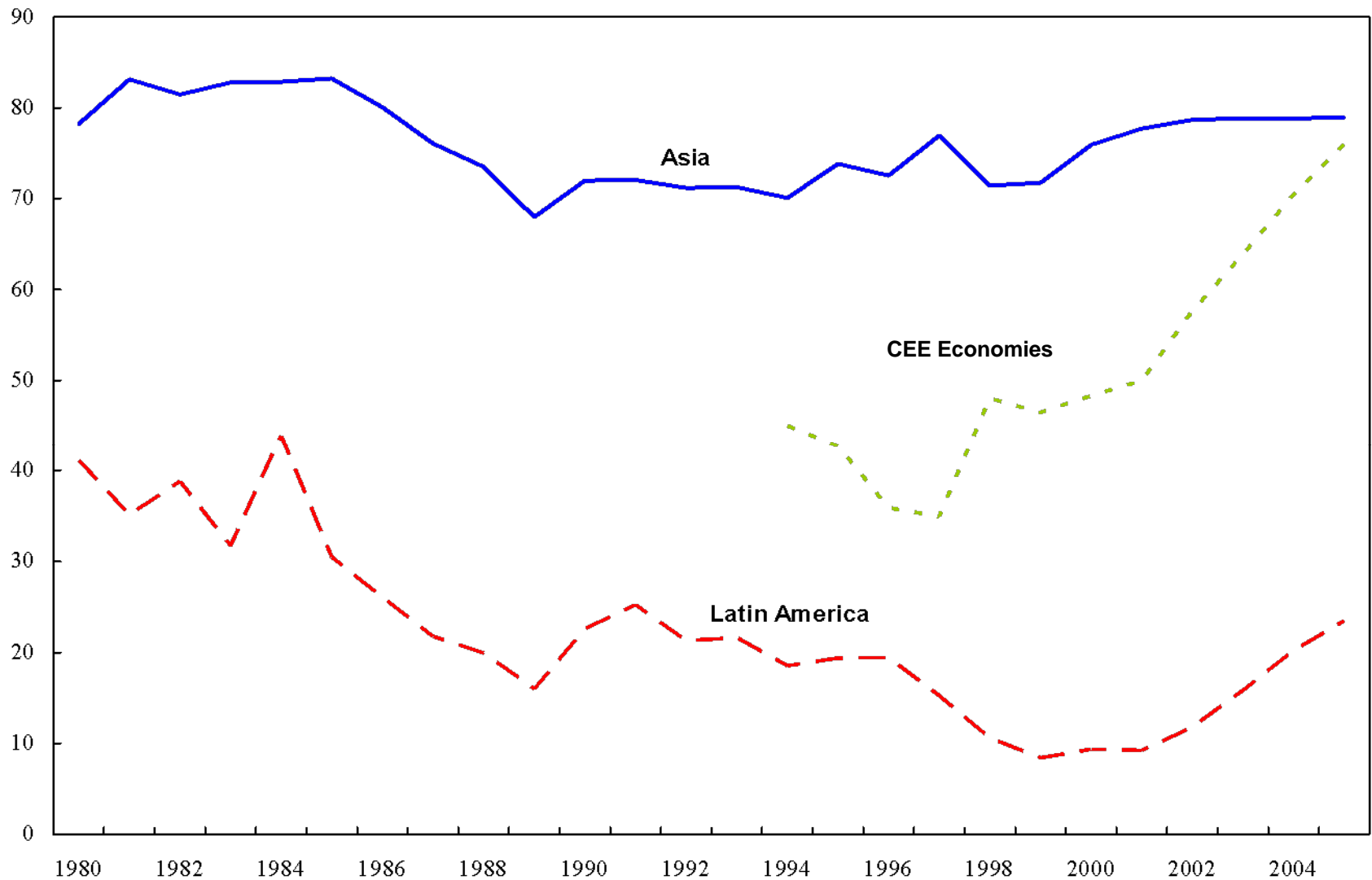


Share of Bonds in Private International Debt

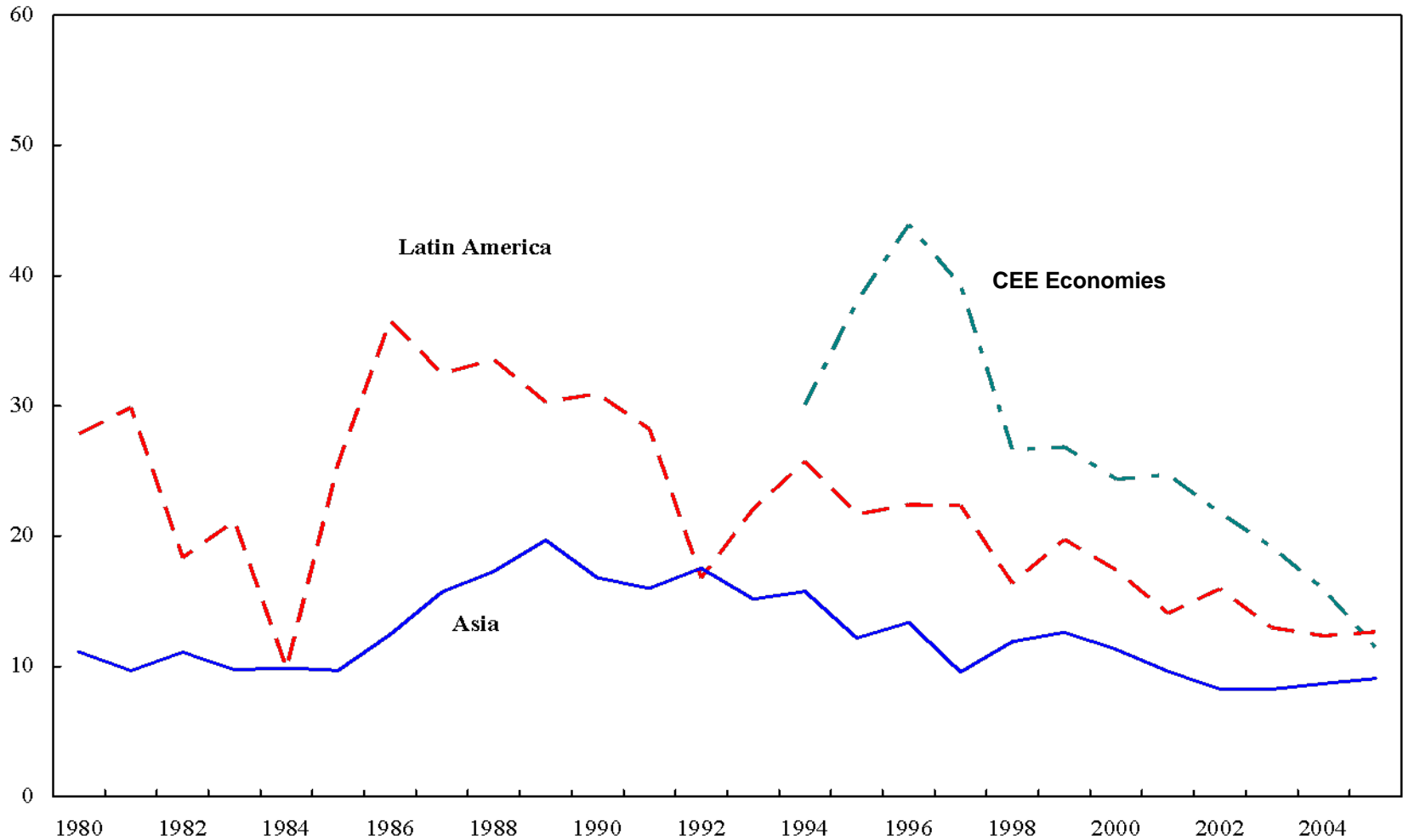




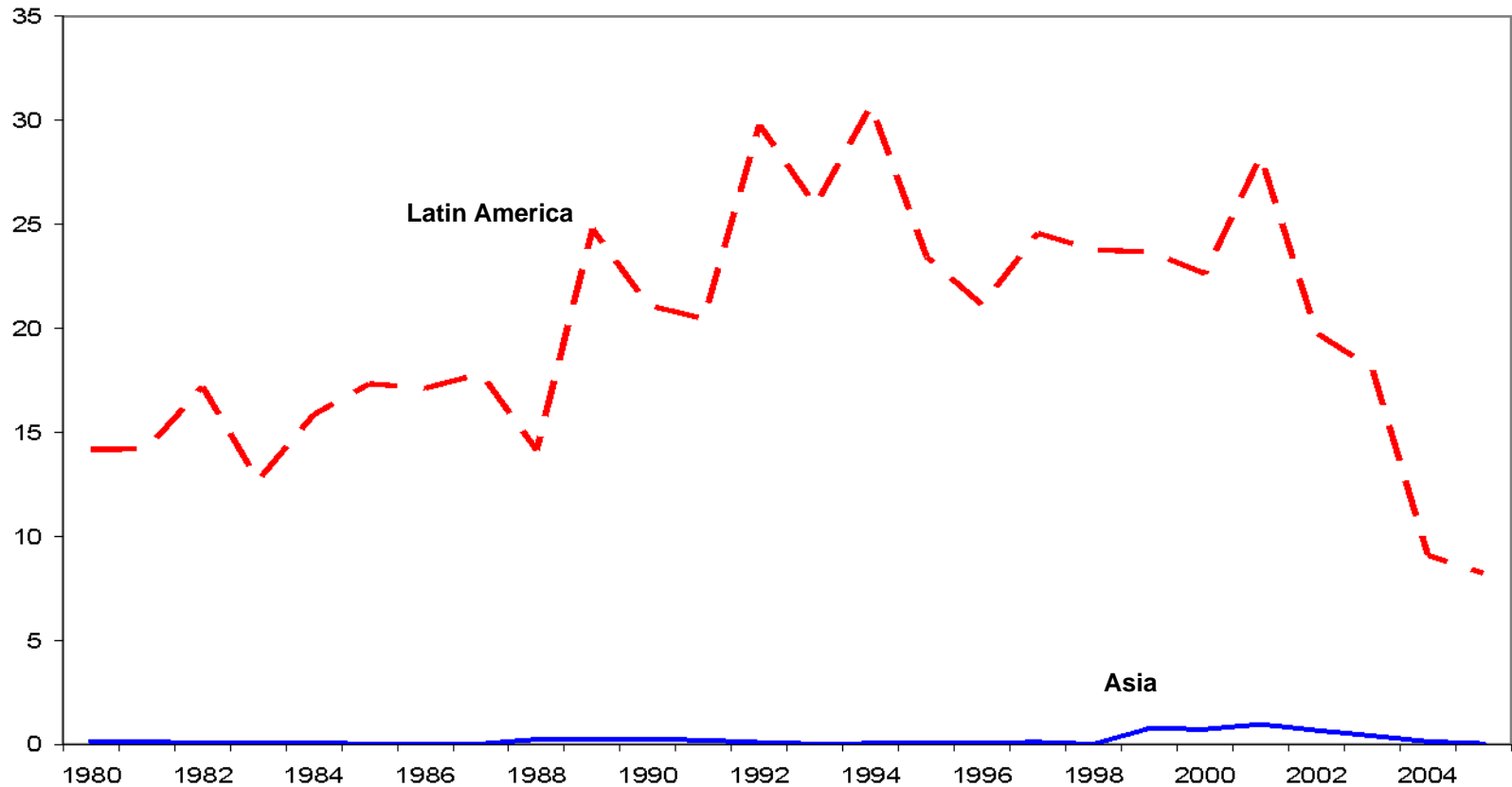
# Domestic “Original Sin” is on the way out



# Share of ST Debt Outstanding in Domestic Debt



# Dedollarization Trend in Domestic Debt





# **EMPIRICAL RESULTS**

# Determinants of domestic debt share ( $S_D$ )

	<i>OLS</i>		<i>D-D Estimation</i>		<i>Country Fixed</i>		<i>Censored Tobit</i>	
<i>M2_GDP</i>	-0.04 (0.03)	0.02 (0.03)	-0.001 (0.09)	0.13 (0.08)	0.02 (0.05)	0.08 (0.05)	-0.03 (0.03)	0.04 (0.04)
<i>I.DDebtShare</i>	<b>0.94</b> <b>(0.03)***</b>	<b>0.94</b> <b>(0.02)***</b>			<b>0.83</b> <b>(0.04)***</b>	<b>0.80</b> <b>(0.04)***</b>	<b>0.93</b> <b>(0.04)***</b>	<b>0.91</b> <b>(0.04)***</b>
<i>L2.DDebtShare</i>			0.03 (0.06)	0.03 (0.05)				
<i>PrCrBOF_GDP</i>		-0.04 <b>(0.2)*</b>		-0.23 <b>(0.07)***</b>		-0.13 <b>(0.04)***</b>		-0.04 (0.03)
<i>prSavRate</i>	0.10 (0.07)	<b>0.20</b> <b>(0.08)***</b>	0.16 (0.12)	0.07 (0.11)	<b>0.25</b> <b>(0.12)**</b>	<b>0.28</b> <b>(0.10)***</b>	0.10 (0.08)	<b>0.22</b> <b>(0.09)**</b>
<i>StkMktVal_GDP</i>	0.02 (0.01)		0.01 (0.02)		0.02 (0.02)		0.02 (0.02)	
<i>trade_gdp</i>	0.02 (0.02)	0.01 (0.02)	<b>-0.14</b> <b>(0.07)*</b>	<b>-0.13</b> <b>(0.07)*</b>	0.02 (0.04)	<b>0.04</b> <b>(0.03)*</b>	0.02 (0.02)	0.01 (0.02)
<i>log_inflation</i>	<b>-0.89</b> <b>(0.35)**</b>	<b>-0.85</b> <b>(0.35)**</b>	<b>-1.43</b> <b>(0.60)**</b>	<b>-1.04</b> <b>(0.53)*</b>	<b>-1.16</b> <b>(0.40)***</b>	<b>-0.98</b> <b>(0.37)***</b>	<b>-1.03</b> <b>(0.37)***</b>	<b>-0.94</b> <b>(0.36)***</b>
<i>reratevol5y</i>	-0.04 (0.45)	0.43 (0.44)	-1.05 (0.94)	-0.85 (0.79)	-0.14 (0.73)	-0.26 (0.65)	-0.04 (0.50)	0.19 (0.55)
<i>QBureaucr.</i>	-0.46 (0.56)		1.72 (1.48)		<b>-1.35</b> <b>(0.81)*</b>	-0.53 (0.56)	-0.46 (0.60)	
<i>PoliticStable</i>		<b>0.08</b> <b>(0.04)*</b>		<b>0.15</b> <b>(0.08)*</b>		<b>0.13</b> <b>(0.05)**</b>		<b>0.10</b> <b>(0.05)**</b>
<i>Constant</i>	5.34 (2.64)***	-2.83 (3.50)***	1.01 (1.48)**	1.10 (0.43)**	8.58 (4.35)**	0.37 (4.39)***	6.26 (3.01)***	-3.19 (3.90)
N	266	292	243	270	266	292	268	294
Overall R <sup>2</sup>	0.90	0.91	0.07	0.11	0.89	0.89		
Wald Chi <sup>2</sup>							1614.64	1457.37

# Determinants of domestic debt share ( $S_D$ ) - Summary

	$L.S_D$	$\pi$	$\sigma_{RER}$	M2_GDP	PrSavRate	PrCrBOF	trade_gdp	PolStab
Priors	+	-	?	+	+	?	?	+
FE	0.80***	-0.80**	-0.26	0.11*	0.28***	-0.13***	0.04*	0.13**
DD	0.03	-1.04*	-0.85	0.13	0.07	-0.23***	-0.13*	0.15*

## Determinants of traded domestic debt share ( $S_{DT}$ )

	L.SD <sub>T</sub>	$\pi$	$\sigma_{RER}$	M2_GDP	PrSavRate	StkMkt	trade_gdp	Qbur	L5.SE <sub>T</sub>
<b>Priors</b>	+	-	?	?	+	+	?	+	+
<b>FE</b>	0.72***	-1.27*	0.02	-0.07	0.54***	0.04*	-0.07	0.47	0.05**
<b>DD</b>	-0.12**	0.04	-0.18	-0.18	0.47**	0.01	-0.21*	1.7	0.02

# Determinants of DLTF debt share

	$L.S_{DLTF}$	$\pi$	$\sigma_{RER}$	M2_GDP	PrSavR	StkMkt	trade_gdp	Qbur	DServ
<b>Priors</b>	+	-	?	+	+	+	?	+	+
<b>FE</b>	0.42***	-1.67**	1.92	0.20***	-1.08***	-0.09***	0.16**	3.33**	-0.64**
<b>CTobit</b>	0.63***	-3.93***	2.11*	0.15**	-0.17	-0.04	0.03	3.67**	-1.01***



# Maturity Structure of Domestic Debt - $S_{ST}$

	$L.S_{ST}$	$\pi$	$\sigma_{RER}$	M2_GDP	PrSavR	StkMkt	trade_gdp	Qbur	int_gap
<b>Priors</b>	+	+	+	-	?	-	?	-	+
<b>DD</b>	0.05	1.37**	0.16	0.09	0.14	0.04	0.01	0.34	0.13***
<b>CTobit</b>	0.32***	-1.91	1.40	0.02	-0.08	-0.03	0.11**	-7.08***	0.10

# Determinants of $S_{FX}$

	$L.S_{ST}$	$\pi$	$\sigma_{RER}$	M2_GDP	DService	StkMkt	trade_gdp	Qbur	$S_{E\_FX}$
<b>Priors</b>	+	+	?	-	?	-	?	-	+
<b>FE</b>	0.15**	-0.21	-2.63***	-0.11	-0.37*	0.03	0.02	-0.17	0.09
<b>CTob</b>	0.28***	-0.50	-3.12**	-0.22**	0.02	-0.03	0.06	-0.35	0.13***

# Inflation-indexation and Interest Rate Indexation

- Inflation indexation - hedge from shocks, especially demand shocks (with a positive correlation between output and inflation)
- Inflation-indexed debt allows governments to lengthen the maturity structure of its debt, thus reducing rollover risk inherent in short-term debt
- Floating-rate debt implies higher debt repayments during bad times, whereas inflation-indexed debt is usually provides a slight hedge
- It is better to index it to slowly-moving variables like inflation than to financial variables like exchange rates and short-term interest rates that respond instantaneously to shocks

# Conclusions

- The structure of government debt has important implications for the probability of financial crises and their severity
- Unstable macroeconomic environment, poor institutional characteristics and political uncertainty prevent the development of domestic debt market, its securitization, and issuance of DLTF debt.
- While the structure of international debt is to a large extent determined by international financial markets, the structure of government domestic debt is more under control of the government.