"Dollarisation in Emerging Market Economies"

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Dollarisation, the fact that a significant share of residents’ assets and liabilities are denominated in foreign-currency, is a common feature of developing countries and transition economies.

Outline:
1- Trends and explanations
2- Implications for monetary policy and financial stability
3- Arguments about official dollarisation
Bibliography includes:


Barajas, Adolfo and Armando Méndez Morales (2003). Dollarisation of Liabilities: Beyond the Usual Suspects, IMF wp No. 03/11


Bogetic, Z., “Full Dollarization: Fad or Future?”, Challenge, Mar/Apr 2000, Vol. 43 Issue 2, p17, 32p, 2 graphs


Levy-Yeyati (2006), « Fiancial dollarisation : evaluating the consequences », Economic policy


Part 1: TRENDS AND EXPLANATIONS

DEFINITIONS

MEASURING DOLLARISATION

Measuring FCC
- Direct measurement of FCC
- Indirect measurement of FCC

Deposit and Loan dollarisation
Deposit and real dollarisation

EXPLANATIONS

Weak institutions
Dollarisation hysteresis
Dollarisation and “Gresham’s Law”
Determinants of financial dollarisation
- The portfolio view
- The market failure view
- The institutional view
- The “original sin” view”
DEFINITIONS:

Home currency is being replaced by another in its basic functions

<table>
<thead>
<tr>
<th>Affected function of money</th>
<th>Affected economic variables</th>
<th>Dollarisation label</th>
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</thead>
<tbody>
<tr>
<td>store of value</td>
<td>assets/liabilities</td>
<td>financial dollarisation (asset substitution, liability dollarisation)</td>
</tr>
<tr>
<td>medium of exchange</td>
<td>transactions/payments</td>
<td>currency substitution</td>
</tr>
<tr>
<td>unit of account</td>
<td>price and wage setting</td>
<td>real dollarisation</td>
</tr>
</tbody>
</table>
Two dimensions: partial or complete / informal or official

<table>
<thead>
<tr>
<th>Dollarisation</th>
<th>de facto (unofficial)</th>
<th>de jure (official)</th>
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<tbody>
<tr>
<td>Partial (monetary plurality)</td>
<td>Passive management of dollarisation</td>
<td>Active management of dollarisation</td>
</tr>
<tr>
<td><strong>A1:</strong> Partial and non endorsed loss of sovereignty</td>
<td>The most prevalent regime</td>
<td><strong>A2:</strong> Partial and endorsed loss of sovereignty</td>
</tr>
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<td></td>
<td>A spontaneous process chosen by private economic agents</td>
<td>intermediary regime betw. A1 and B2. Official bi-monetary regime with some institutional resistance: authorities maintain the national unit of account with the obligation to pay taxes with this unit of account (Guatemala, Liberia)</td>
</tr>
<tr>
<td></td>
<td>(most of Latin American economies, Russia …)</td>
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<tr>
<td>Complete (monetary exclusiveness)</td>
<td><strong>B1:</strong> Complete and non endorsed loss of sovereignty</td>
<td><strong>B2:</strong> Complete and endorsed loss of sovereignty</td>
</tr>
<tr>
<td></td>
<td>A special regime: lack of political sovereignty (separatist tendency, situation of conflict, the dissolution of a political entity). Ex: East Timor, Kosovo before 2000</td>
<td>Indirect dollarisation: outcome of A1 or A2. Authorities &quot;capitulate&quot;. (Ecuador)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direct dollarisation or ex nihilo, after B1, when a political entity is founded or affirmed. (Montenegro, Kosovo, East Timor)</td>
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**MEASURING DOLLARISATION**

Breakdown of *effective* broad money (EBM)

<table>
<thead>
<tr>
<th></th>
<th>foreign cash in circulation outside banks</th>
<th>local cash in circulation outside banks</th>
<th>local currency checkable deposits</th>
<th>local currency time and savings deposits</th>
<th>foreign currency deposits</th>
<th>cross-border deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FCC</strong></td>
<td>LCC</td>
<td>LCD</td>
<td>LTD</td>
<td>FCD</td>
<td></td>
<td>CBD</td>
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<tr>
<td>Narrow money</td>
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<td></td>
<td></td>
<td>Quasi money</td>
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<tr>
<td>$\text{NM} \equiv \text{LCC} + \text{LCD}$</td>
<td></td>
<td></td>
<td></td>
<td>$\text{QM} \equiv \text{FCD} + \text{LTD}$</td>
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<tr>
<td><strong>Effective narrow money</strong></td>
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<tr>
<td>$\text{ENM} \equiv \text{FCC} + \text{NM}$</td>
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<tr>
<td>Broad money</td>
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<tr>
<td>$\text{BM} \equiv \text{NM} + \text{QM}$</td>
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<tr>
<td><em>effective</em> broad money</td>
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<tr>
<td>$\text{EBM} \equiv \text{FCC} + \text{BM} + \text{CBD}$</td>
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</table>

See Feige & Dean (2004) – *but they ignore CBD*
explicit currency substitution index (CSI): $\text{CSI} \equiv \frac{\text{FCC}}{\text{FCC} + \text{LCC}}$

lack of data on foreign currency in circulation (FCC) $\rightarrow$ accept the observable amount of foreign currency deposits (FCD) as a proxy for dollarisation.

$\rightarrow$ common dollarisation index: $\text{DI}_{\text{IMF}} \equiv \frac{\text{FCD}}{\text{BM}}$ (often associated with the IMF)

LCDs are also used to settle domestic transactions $\rightarrow$ modify the CSI:

$\text{CSI}_n \equiv \frac{\text{FCC}}{\text{ENM}}$

the fraction of effective narrow money denominated in foreign currency

asset substitution index (ASI): $\text{ASI} \equiv \frac{\text{FCD}}{\text{LCD} + \text{QM}}$

a broader unofficial dollarisation index (UDI) that represents. Thus:

(10) $\text{UDI} \equiv \frac{\text{FCC} + \text{FCD}}{\text{EBM}}$.

the fraction of a nation’s broad effective money supply composed of foreign monetary assets
MEASURING DOLLARISATION

Currency substitution, real dollarisation:
Relevant data may not be available on a regular basis
- data on transactions, invoicing practices
- foreign currency banknotes in circulation
- value and currency denomination of private sector assets and liabilities

Asset dollarisation:
Data available on bank balance sheets and public debt
- Dollarisation of bank deposits (overnight, term…/households, firms…):
  share of foreign currency deposits in total deposits
- Dollarisation of bank credits
- Dollarisation of bank vault cash (can give some rough idea on the
  relative use of foreign currencies in cash payments)
- Dollarisation of public debt

No regular data on cross-border deposits of private sector
sources of data:

- IMF
- BIS: Committee on Payment and Settlement Systems (CPSS) on payment systems, some international banking (CBDs)
- Central banks (on banks), Ministry of Finance (on public debts)

Most widely used index of dollarisation is

\[ \text{FCDs}/(\text{home currency cash} + \text{HCDs} + \text{FCDs}) \]

A “floor” level of non financial resident asset dollarisation (does not include CBDs and non-bank assets)
FCDs/Total bank deposits – countries with highest deposit dollarisation, highest year 1990-2000

Cambodia
Bolivia
Angola
Zaire
Georgia
Lebanon
Croatia
Tajikistan
Armenia
Azerbaijan
Laos
Nicaragua
Peru
Belarus
Lithuania
Argentina
Guinea Bissau
Bulgaria
Egypt
Greece
Mozambique
Paraguay
Turkey
Sao Tome & Principe

Honohan & Shi WB wps 2748
Measuring FCC

NB: Federal Reserve Survey of Currency Usage reveals that US households admit to holding less than 10% of US total currency in circulation (outside banks)!

In the late 1990s and in 2000, 55-60% of US currencies circulate abroad. (The Use and Counterfeiting of United States Currency Abroad, March 2003)
8-15% of Euro currencies circulate abroad. (Review of the international role of the euro, January 2005)

US (and Euro) cash has many desirable properties.
- a reputation as a stable currency (reliable store of value: protects foreign users against bank failures, devaluation and inflation.
- available in many countries, is widely accepted as a medium of exchange (esp. for illicit commercial activities, smuggling)
- cash usage preserves anonymity

→ difficult to determine the exact amount and location of notes circulating abroad.
Direct measurement of FCC (USD, EUR)

1- Systematic records: the United States Customs Service: collects information on physical cross border flows of US currency (in amounts exceeding $10,000). → Currency or Monetary Instruments Reports (CMIR)

FED, Eurosystem: net shipment of banknotes to destinations abroad (miss tourism, worker remittances, grey economy)

2- Surveys:
• conducted by Federal Reserve and Treasury officials.
• conducted by the Oesterreichische Nationalbank in Croatia, Hungary, the Czech Republic, Slovenia and Slovakia since 1997
Indirect measurement of FCC

1- Denomination Displacement Method (Feige et al. (2001) on Croatia)

In dollarized countries using FCC as a means of exchange, most transactions are effected with the largest denomination bills available.
→ countries that are heavily dollarized, with large denomination foreign bills, will have domestic currency (LCC) denomination structures that are unusually skewed away from the higher denomination domestic bills.
Denomination displacement occurs as higher denomination FCC bills substitute for high denomination LCC bills.

→ a lower bound estimate (lower denominations may also be employed for various transactions).
2- **Money Demand Method** (Feige et al. (2001) on Croatia) investigate the demand for money in a highly dollarized country for which data were available on the actual amount of currency substitution that had taken place (Argentina) → estimate an empirical demand function for FCC in Argentina that depended upon independent variables that are readily measured in Croatia. The parameters derived from the estimated FCC demand function for Argentina were then used to simulate the unobserved demand for FCC in Croatia.
Seasonal methods (Fischer et al. 2004 on international use of Euro)
The part of currency that is not related to transaction demand does not exhibit a strong seasonal pattern and therefore dampens the seasonal variability of currency.

A best fit approach (Fischer et al. 2004 on international use of Euro)
find the share of currency within M1 that optimises a simple bivariate inflation equation for forecasting inflation one year ahead.

\[ \pi_{t+1} = \alpha + \beta(L)\pi_t + \gamma(L) \cdot (od_t + \theta \cdot cu_t) + \chi \text{time}_t + \varepsilon_{t+1} \]

\( cu = \) nominal cash balances, \( od = \) overnight deposits

\( \rightarrow \) 30% of the euro area currencies are held for transaction purposes.
\( \rightarrow \) 70% are used for other purposes (foreign demand, hoarding, underground economic activities not included in official transactions).
FCC and LCC per capita (in USD, PPP adjusted, 1997)

source: Feige et al. (2001)
Estimates of Per Capita Holdings of US Currency and Domestic Currency in Latin America (Feige et al. 2002)

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<thead>
<tr>
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<tr>
<td>Argentina</td>
<td>1478</td>
<td>698</td>
<td>374</td>
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<tr>
<td>Bolivia</td>
<td>144</td>
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<td>Brazil</td>
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<td>6</td>
<td>108</td>
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<td>Colombia</td>
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<td>81</td>
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<td>Costa Rica</td>
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<td>Dominican Rep</td>
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<td>Mexico</td>
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<td>Nicaragua</td>
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<td>25</td>
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<td>Panama</td>
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<tr>
<td>Paraguay</td>
<td>18</td>
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<tr>
<td>Peru</td>
<td>67</td>
<td>185</td>
<td>50</td>
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<tr>
<td>Uruguay</td>
<td>762</td>
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<td>199</td>
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<tr>
<td>Venezuela</td>
<td>104</td>
<td></td>
<td>93</td>
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<tr>
<td></td>
<td>Dollars Only</td>
<td>Dollars Only</td>
<td>All Currencies</td>
<td>All Currencies</td>
<td>All Currencies</td>
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<td>Armenia</td>
<td>10.6</td>
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<td>Azerbaijan</td>
<td>21.1</td>
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<td>Belarus</td>
<td>0.8</td>
<td>288</td>
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<tr>
<td>Bulgaria</td>
<td>63.1</td>
<td>120</td>
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<td>Croatia</td>
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<td></td>
<td>166</td>
<td>273</td>
<td>1386</td>
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<tr>
<td>Czech Rep</td>
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<td>220</td>
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<tr>
<td>Estonia</td>
<td>34.7</td>
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<tr>
<td>Hungary</td>
<td>2.2</td>
<td>29</td>
<td></td>
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<tr>
<td>Kazakhstan</td>
<td>288</td>
<td></td>
<td></td>
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<tr>
<td>Kyrgyzstan</td>
<td>7.1</td>
<td></td>
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<tr>
<td>Latvia</td>
<td>432</td>
<td>208</td>
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<tr>
<td>Lithuania</td>
<td>24</td>
<td>139</td>
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<tr>
<td>Poland</td>
<td>90</td>
<td>26</td>
<td></td>
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<tr>
<td>Romania</td>
<td>10.3</td>
<td>52</td>
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<td>Russia</td>
<td>448</td>
<td>407</td>
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<td>Slovak Rep</td>
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<td>148</td>
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<td>Slovenia</td>
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<td>246</td>
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<tr>
<td>Turkey</td>
<td>74.7</td>
<td>157</td>
<td></td>
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<td></td>
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<tr>
<td>Ukraine</td>
<td>23.9</td>
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</table>
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Part 1: TRENDS AND EXPLANATIONS

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Deposit and Loan dollarisation (1990-2001)

- similar patterns
- loan dollarisation < deposit dollarisation (banks maintain a sizeable fraction of FCDs in liquid correspondent accounts or sovereign assets abroad)
- a 10% increase in deposit dollarisation results on average in a 7.3% increase in loan dollarisation
Deposit and real dollarisation (1990-2001)

Real dollarisation appears to remain generally limited and loosely correlated with financial dollarisation

Real dollarisation is measured indirectly by the pass-through of exchange rate changes into prices: some measure of the elasticity of the consumer price index with respect to the foreign currency price (exchange rate)
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Currency and asset substitution are typically induced by weak institutions:
- past inflations, devaluations, currency or deposit confiscations
- lack of confidence in banks (hold FCC instead of FCD)
- the growth of underground economies, illegal trade, conflicts

Persistence of large fiscal deficits $\rightarrow$ high inflation $\rightarrow$ dollarisation

Dollarisation expands from store of value to medium of exchange and unit of account (invoicing in dollars: transactions involving real estate, automobiles, electric appliances, private school fees)

facilitated since the 1970s by the increased freedom granted to financial and currency markets (elimination of foreign exchange controls, license granted to residents to hold foreign exchange)
Dollarisation hysteresis

Dollarisation remains high after inflation stabilisation

Financial innovation and liberalisation permanently reduce the cost of holding assets denominated in foreign currency

**Financial adaptation:** high inflation forces the gradual development of new financial instruments and institutions (e.g. foreign-currency deposits) that decrease the demand for domestic money for a given level of domestic *nominal* interest rates. Creating new financial products is costly and requires a learning process. Once this "investment" has been done, the public will continue to use these new financial instruments even if inflation falls.

-Dornbusch and Reynoso (1989) and Dornbusch, Sturzenegger, and Wolf (1990)

**Learning costs, switching costs:** the switch from domestic to foreign currency that results from high inflation is costly and occurs only slowly over time. As a result, there is a "band" for the inflation differential within which there is no incentive to switch between currencies

- above the band, dollarisation increases
- below the band, dollarisation decreases
- if inflation falls, but the inflation differential remains within the band, dollarisation does not change

-(Guidotti & Rodriguez 1982)
network externalities: the benefit/cost ratio attached to foreign currency rises rapidly with the number of users relative to users of the domestic currency

- cash users
- interbank settlements

the economy's accumulated experience in using a foreign currency as a means of payment acts as an externality that reduces the private marginal cost of buying goods with the foreign currency.

\[ \rightarrow \] at moderate levels of inflation, there are two stable steady states (domestic currency only, both domestic and foreign currencies)

\[ \rightarrow \] a temporary increase in expected inflation during which individuals accumulate experience in using the foreign currency can drive the economy from the dedollarized to the dollarized steady state, causing a permanent increase in domestic money velocity.

(Uribe 1997)

Lack of credibility in the sustainability of the stabilization plan

External shocks that more than offset the de-dollarisation that one would have expected after stabilization.
Portfolio decisions

→ a distinction between currency substitution and asset substitution

from portfolio theory (Thomas 1985):

<table>
<thead>
<tr>
<th>currency substitution</th>
<th>asset substitution</th>
</tr>
</thead>
<tbody>
<tr>
<td>depends on</td>
<td>depends on</td>
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<tr>
<td>relative nominal rates of returns</td>
<td>relative real rates of return</td>
</tr>
<tr>
<td>(and risks and risk aversion)</td>
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</tbody>
</table>

→ hysteresis is no puzzle since (asset) dollarisation depends on real returns, not inflation

→ over time, the asset dollarisation has become more important than currency substitution (because many countries, esp. in Latin America, moved from financial repression to financial integration)

→ in Poland, Estonia, Lithuania and Mongolia, de-dollarisation in the early 1990s coincided with an increase in real returns on HCDs (as well as disinflation).
Dollarisation and “Gresham’s Law”

The usual expression, "bad money drives out good" is a mistake…
The correct expression of Gresham's Law is:
"cheap money drives out dear, if they exchange for the same price."

Persistent use of the local currency for payments (De Nicolo et al. IMF wp03/146)
The public disposes of the “bad” (local) currency it receives by using it for payments and keeps the “good” currency (USD, EUR) under the mattress.

Gresham’s Law in reverse? (Guidotti & Rodriguez, IMF Staff papers 1992)
“More and more transactions are transferred to the dollar system. What is observed does not appear to be exclusively the result of a portfolio composition decision, but rather a wider process through which markets are gradually changing the currency in which transactions are denominated and settled. Contrary to Gresham’s law, which applies to currencies with intrinsic value (such as coins minted in precious metals), for paper currencies it is the good money that displaces the bad money”
Determinants of financial dollarisation

(Levy-Yeyati 2006, De Nicolo, Honohan, Ize 2005)

1- The portfolio view:

FD explained as the optimal portfolio choice for a given distribution of real returns in each currency.

Dollarisation arises as a protection against a variety of risks
- Currency instability
- High and unstable inflation
- Real exchange rate depreciation

currency choice is determined by hedging decisions on both sides of a bank’s balance sheet (depositors and borrowers)
→ deposit and loan dollarisation interact through the loanable funds market.

(Ize & Levy-Yeyati 2003)
2- The market failure view:
FD explained as the suboptimal response to a market imperfection

Example 1: (Broda and Levy-Yeyati)
combine two ingredients:
• imperfect information on the currency composition of the borrower.
  → interest rates cannot be made contingent on the currency composition of
    the borrower’s liabilities
  → the scrap value of a failed debtor is distributed among creditors on a pro
    rata basis
• positive correlation between the probability of default and the real exchange rate
  → dollar lenders fare better in default states

→ Peso lenders demand an additional return to compensate for the lower return
on peso assets in the event of a devaluation cum default.
→ the borrower finds dollar funding relatively cheaper, and dollarises.

In case of a uniform creditor guarantee or full deposit insurance:
↑ recovery value of a failed investment → ↑ benefits of the dollar in default states
→ ↑peso premium in non-default states.
Example 2: (Jeanne)

a peso problem
→ a large peso interest rate premium due to devaluation expectations
    (small probability \( P \) of a large devaluation \( \varepsilon \))

e.g.: \[ 1 + r_\$ = (1 + r_£) \left[(1 - P) + \frac{P}{1+\varepsilon}\right] \]

→ a potentially large peso-dollar spread
→ the default risk of a peso borrower indebted at a high interest rate exceeds the risk of a dollar borrower that faces a sure death only in the unlikely devaluation scenario.
→ In this context, the borrower would prefer to take his chances with the foreign currency.
**Example 3:** (Burnside et al., 2001) externalities that generate the perception of implicit debtor guarantees.

The social cost of massive bankruptcies following a sharp devaluation makes a debtor bailout ex post optimal for the government.  
\[ \rightarrow \] borrowers anticipate this bailout (implicit debtor guarantee)  
\[ \rightarrow \] as in the case of deposit insurance, a debtor guarantee is more valuable for dollar debtors (because it pays when dollar debts are more costly) and introduces a dollar advantage.

The implicit debtor guarantee argument highlights the time inconsistency of the government’s promise to limit its involvement in the resolution of a financial crisis with widespread negative externalities.
3- The institutional view
institutional failures can foster FD, either by introducing new distortions or by reinforcing the channels discussed before

time-inconsistency of no bail-out policy:
weak institutions find it hard not to bail out dollar debtors in the event of a sudden devaluation (“too-many-to-fail”) → they may compound the mispricing associated with implicit government guarantees.

deliberate currency-blind policies:
- public debt dollarisation: a deliberate decision by the issuer to avert the inflation bias (temptation of a peso-indebted government to inflate away the real burden of the debt)
- the dollar-friendly regulation: a commitment mechanism (as the government borrows credibility by making the costs of a devaluation prohibitively high)

dollarisation could be viewed seen as the collateral cost of low institutional credibility
4- The “original sin” view

**Origins of currency mismatch**: primarily in past and present weaknesses in domestic economic policies and institutions themselves rather than imperfections in international capital markets?

Eichengreen, Hausmann and Panizza: in international capital markets

“Original sin” = inability to borrow abroad in domestic currency, or, in general, inability to borrow long term in domestic currency

→ an innate weakness not due to past behaviour but that limits what emerging markets can achieve on their own merits

→ incompleteness in international financial markets that needs an "international solution"
Goldstein and Turner (2004): in domestic economic policies

1. inadequate incentives to hedge against currency risk, linked to fixed exchange rate regimes and poorly designed official safety nets
2. shortcomings in national macroeconomic policies, the legacy of poor inflation performance, which impedes the development of a local currency denominated bond market
3. inadequate public information on the external and sectoral composition of currency mismatches, which has undermined market discipline
4. poor credit-risk assessment by banks in the extension of FCL to corporate customers with little foreign-currency revenues
5. problems with the design and/or enforcement of bank regulations, esp. as regards effective limits on banks' true exposure to exchange rate changes
6. excessive recourse to foreign currency-indexed when inflation-indexed debt would be a better transitional vehicle towards fixed-rate debt
7. according too low a priority on developing domestic bond markets, encouraging the availability of hedging instruments and reducing barriers to entry of foreign-owned banks