"Dollarisation in Emerging Market Economies"

Dr. Jean-Baptiste DESQUILBET
LEO (Laboratoire d'Economie d'Orléans)
Université d'Orléans
FRANCE

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:

Antinolfi, Gaetano and Todd Keister (2001), "Dollarisation as a Monetary Arrangement for Emerging Market Economies" Review (Federal Reserve Bank of Saint Louis), Nov/Dec2001, Vol. 83 Issue 6, p29

Baliño, Tomàs, Adam Bennett and Eduardo Borensztein (1999), *Monetary Policy in Dollarized Economies*, International Monetary Fund, *Occasional Paper* No. 171, March 1999

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

Berg A., Borensztein E. (2000), "The Dollarization Debate", Finance & Development, March 2000, Volume 37, Number 1

Bogetic, Z, "Full Dollarization: Fad or Future?", *Challenge*, Mar/Apr2000, Vol. 43 Issue 2, p17, 32p, 2 graphs

Calvo, Guillermo A.(2002), "On dollarisation", Economics of Transition, Volume 10 (2) 2002, 393–403

Calvo, Guillermo A.; Rodriguez, Carlos Alfredo (1977), A Model of Exchange Rate Determination under Currency Substitution and Rational Expectations, Journal-of-Political-Economy; 85(3), June 1977, pp. 617-25.

Calvo, Guillermo A.; Vegh, Carlos A. (1993), 'Currency Substitution in High Inflation Countries', *Finance-and-Development*; 30(1), March 1993, pages 34-37.

Calvo, Guillermo A. et Carlos A. Vegh (1996), "From currency substitution to dollarisation and beyond : analytical and policy issues", in Guillermo A. Calvo (1996), *Money, Exchange rates and Output*, MIT press, Cambridge, 1996, chapter 8, pp. 153-175.

Chang, R. (200), "Dollarization: a scorecard", *Federal Reserve Bank of Atlanta Economic Review* Third Quarter 2000

Edwards, S. (2001), "Dollarization: myths and realities", *Journal of Policy Modeling*, vol. 23, pp. 249-265

Feige, Edgar, & Dean (2004), "Dollarisation and Euroization in Transition Countries: Currency Substitution, Asset Substitution, Network Externalities and Irreversibility", Presented at the Fordham University International Conference on "Euro and Dollarisation: Forms of Monetary Union in Integrating Regions" April 5 - 6, 2002, New York

Feige, Edgar & Michael Faulend & Velimir Sonje & Vedran Sosic, (2001). "Currency Substitution, Unoffical Dollarisation and Estimates of Foreign Currency Held Abroad: The Case of Croatia,"

Feige, Edgar & Vedran Šošiæ & Michael Faulend & Velimir Šonje, 2002. "Unofficial Dollarisation in Latin America: Currency Substitution, Network Externalities and Irreversibility,"

Fischer, Björn, Petra Köhler and Franz Seitz (2004), "The demand for euro area currencies: past, present and future", ECB working Paper No. 330, April 2004,Ize, Alain and Eduardo Levy-Yeyati (2003), "Financial dollarisation", *Journal of International Economics*, March 2003, Vol. 59 Issue 2, p323-347.

Fisher S. (1982), "Seigniorage and the case for a national money", *Journal of Political Economy*, vol. 90, April, p. 295-313

Gulde, Anne-Marie, David Hoelscher, Alain Ize, David Marston and Gianni De Nicolo, (2004), *Financial Stability in Dollarized Economies*, International Monetary Fund, *Occasional Paper* No. 230, June 15, 2004

Goldstein, Morris, and Philip Turner (2004), Controlling Currency Mismatches in Emerging Markets, Institute for International Economics, April 2004

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

Levy Yeyati E. and Federico Sturzenegger (2001), "Dollarization: A Primer", Introductory chapter to Dollarization, edited by Eduardo Levy-Yeyati and Federico Sturzenegger, MIT Press

Minda (2005), "Official dollarization: a last resort solution to financial instability in Latin America?", Cahiers du GRES

Morón, Eduardo and Diego Winkelried, (2005) "Monetary policy rules for financially vulnerable economies", Journal of Development Economics, Feb2005, Vol. 76 Issue 1, p23-51

Nicolo, Gianni De, Patrick Honohan, Alain Ize (2005), "Dollarisation of Bank Deposits: Causes and Consequences", Journal of Banking and Finance, July 2005, v. 29, n°7, pp. 1697-1727

Rosenberg, Christoph B., Ioannis Halikias, Brett House, Christian Keller, Jens Nystedt, Alexander Pitt and Brad Setser, (2005), *Debt-Related Vulnerabilities and Financial Crises*, International Monetary Fund, *Occasional Paper* No. 240, October 2005

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

Affected function of money	Affected economic variables	Dollarisation label
store of value	assets/liabilities	financial dollarisation (asset substitution, liability dollarisation)
medium of exchange	transactions/payments	currency substitution
unit of account	price and wage setting	real dollarisation

Two dimensions: partial or complete / informal or official

Dollarisation	***de facto*** (unofficial) Passive management of dollarisation	***de jure*** (official) Active management of dollarisation
Partial (monetary plurality)	**A1:** *Partial and non endorsed loss of sovereignty* The most prevalent regime A spontaneous process chosen by private economic agents (most of Latin American economies, Russia …)	**A2:** *Partial and endorsed loss of sovereignty* 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)
Complete (monetary exclusiveness)	**B1:** *Complete and non endorsed loss of sovereignty* A special regime: lack of political sovereignty (separatist tendency, situation of conflict, the dissolution of a political entity). Ex. : East Timor, Kosovo before 2000	**B2:** *Complete and endorsed loss of sovereignty* Indirect dollarisation: outcome of A1 or A2. Authorities "capitulate". (Ecuador) Direct dollarisation or *ex nihilo*, after B1, when a political entity is founded or affirmed. (Montenegro, Kosovo, East Timor)

Source : Minda (2004)

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"

MEASURING DOLLARISATION

Breakdown of *effective* broad money (EBM)

<table>
<tr><td>foreign cash in circulation outside banks</td><td>local cash in circulation outside banks</td><td>local currency checkable deposits</td><td>local currency time and savings deposits</td><td>foreign currency deposits</td><td>cross-border deposits</td></tr>
<tr><td rowspan="2">FCC</td><td>LCC</td><td>LCD</td><td>LTD</td><td>FCD</td><td rowspan="4">CBD</td></tr>
<tr><td colspan="2">Narrow money
NM ≡ LCC + LCD</td><td colspan="2" rowspan="2">Quasi money
QM ≡ FCD + LTD</td></tr>
<tr><td colspan="3">Effective narrow money
ENM ≡ FCC + NM</td></tr>
<tr><td></td><td colspan="4">Broad money
BM ≡ NM + QM</td></tr>
<tr><td colspan="6">*effective* broad money
EBM ≡ FCC + BM +CBD</td></tr>
</table>

See Feige & Dean (2004) – but they ignore **CBD**

explicit *currency substitution index* (CSI): CSI ≡ FCC/(FCC+LCC)

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

→ common dollarisation index: $DI_{IMF} \equiv FCD/BM$
(often associated with the IMF)

LCDs are also used to settle domestic transactions→modify the CSI:
$CSI_n \equiv FCC/(ENM)$
the fraction of effective narrow money denominated in foreign currency

asset substitution index (ASI): ASI ≡ FCD/(LCD+QM)

a broader *unofficial dollarisation index* (UDI) that represents. Thus:
(10) UDI ≡ (FCC+FCD)/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:

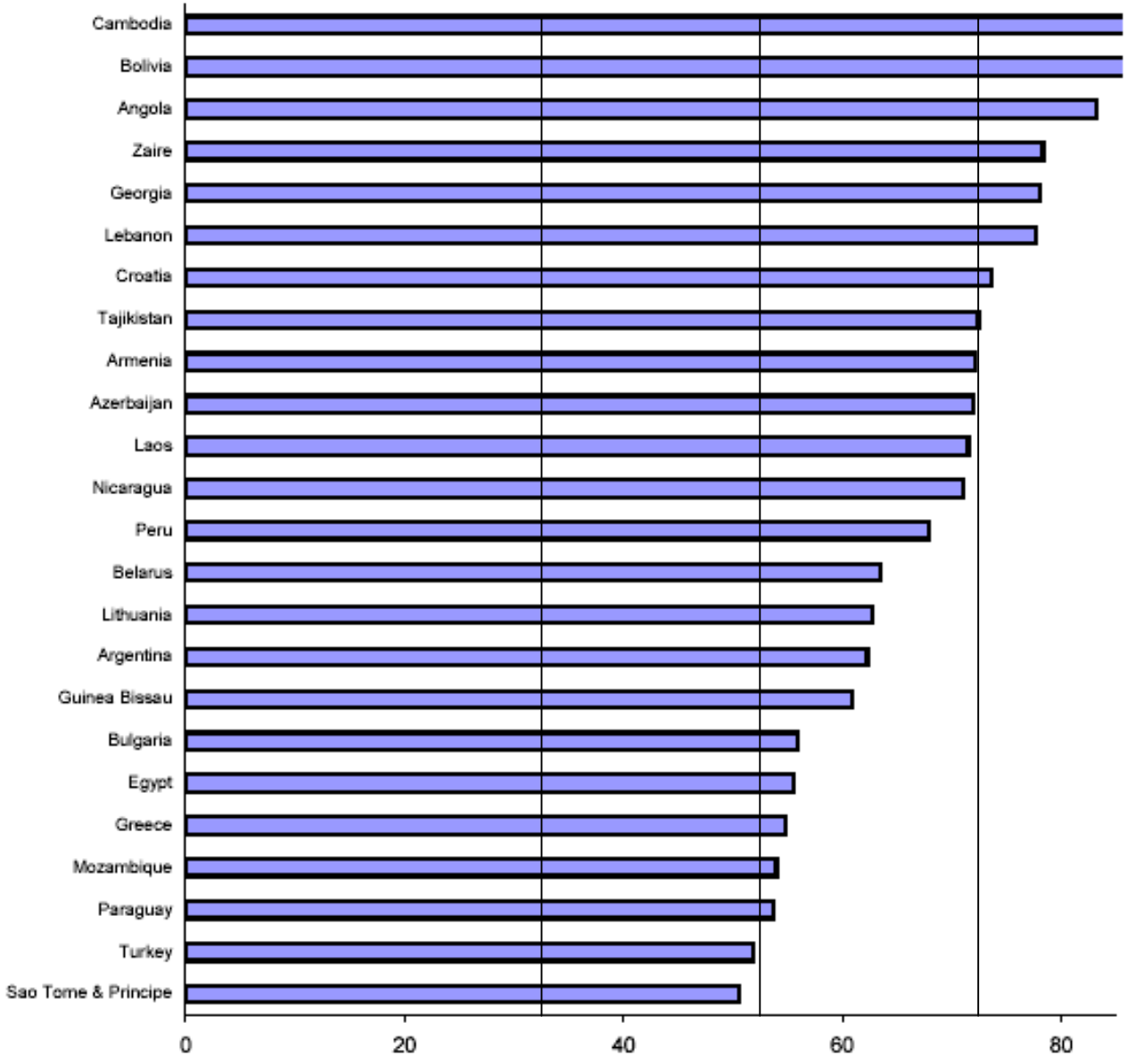
- IMF
- BIS: Committee on Payment and Settlement Systems (CPSS) on payment systems, some international banking (CBDs)
- Central banks (on banks), Ministry of Finance (on public debts)

Most widely used index of dollarisation is

FCDs/(home currency cash + HCDs + 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



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.

[estimating the use of the EUR outside the euro area]

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.

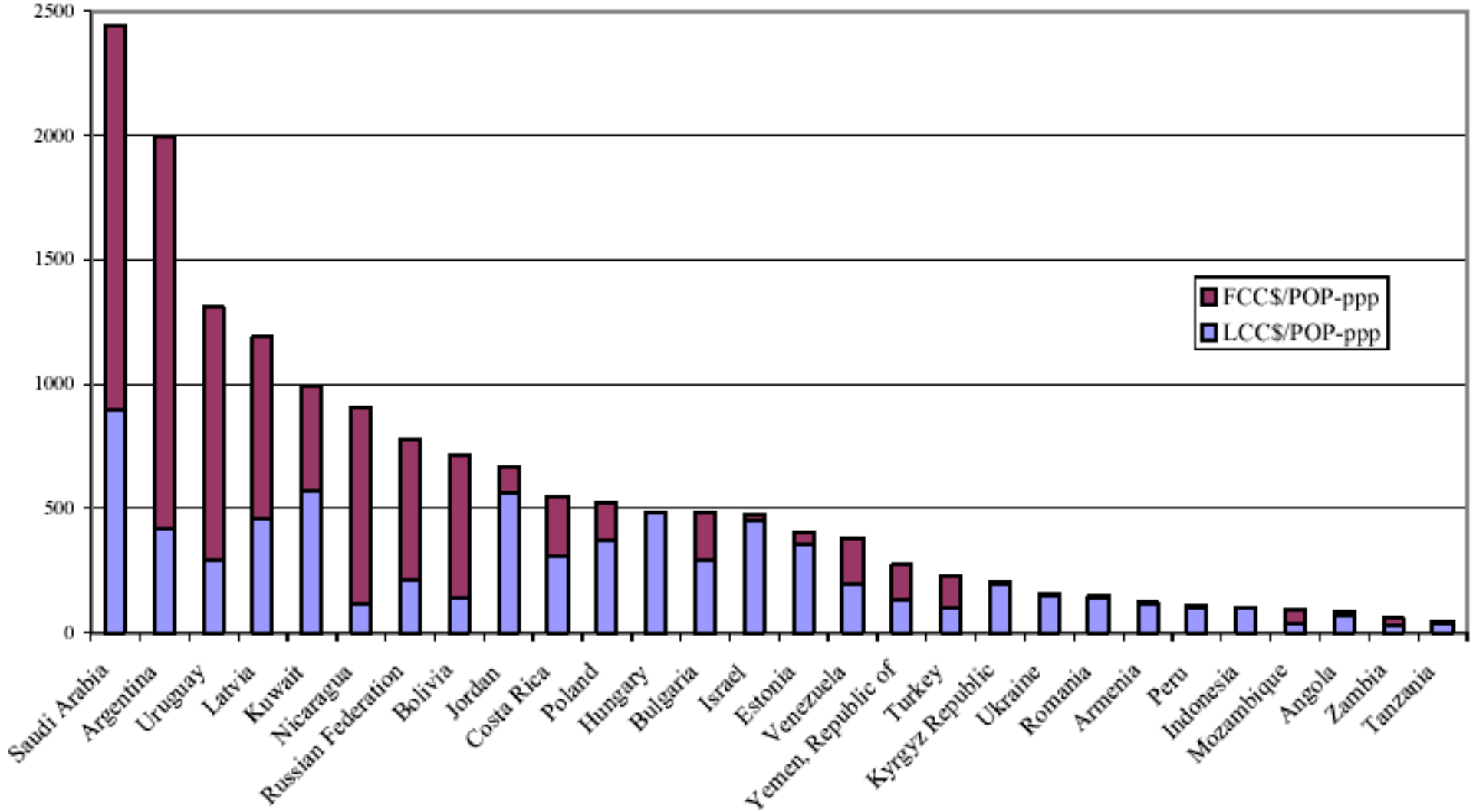
A best fit approach (Fischer et al. 2004 on international use of Euro)
find the share of currency within M1 that optimises a simple bivariate inflation equation for forecasting inflation one year ahead.

$$\pi_{t+1} = \alpha + \beta(L)\pi_t + \gamma(L)\cdot(od_t + \theta \cdot cu_t) + \chi time_t + \varepsilon_{t+1}$$

cu= nominal cash balances, *od* = overnight deposits

→ 30% of the euro area currencies are held for transaction purposes.
→ 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)



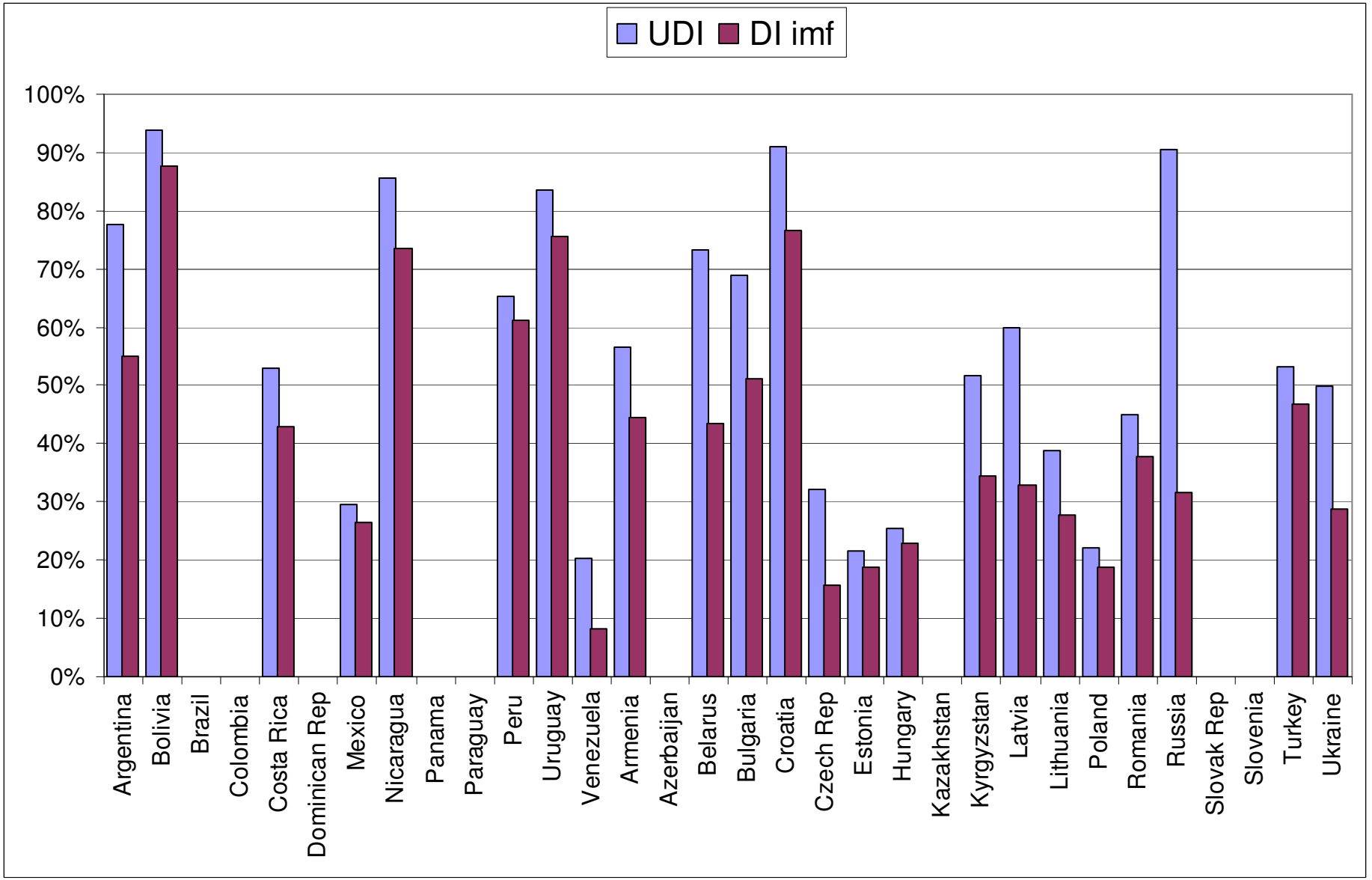
source: Feige et al. (2001)

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

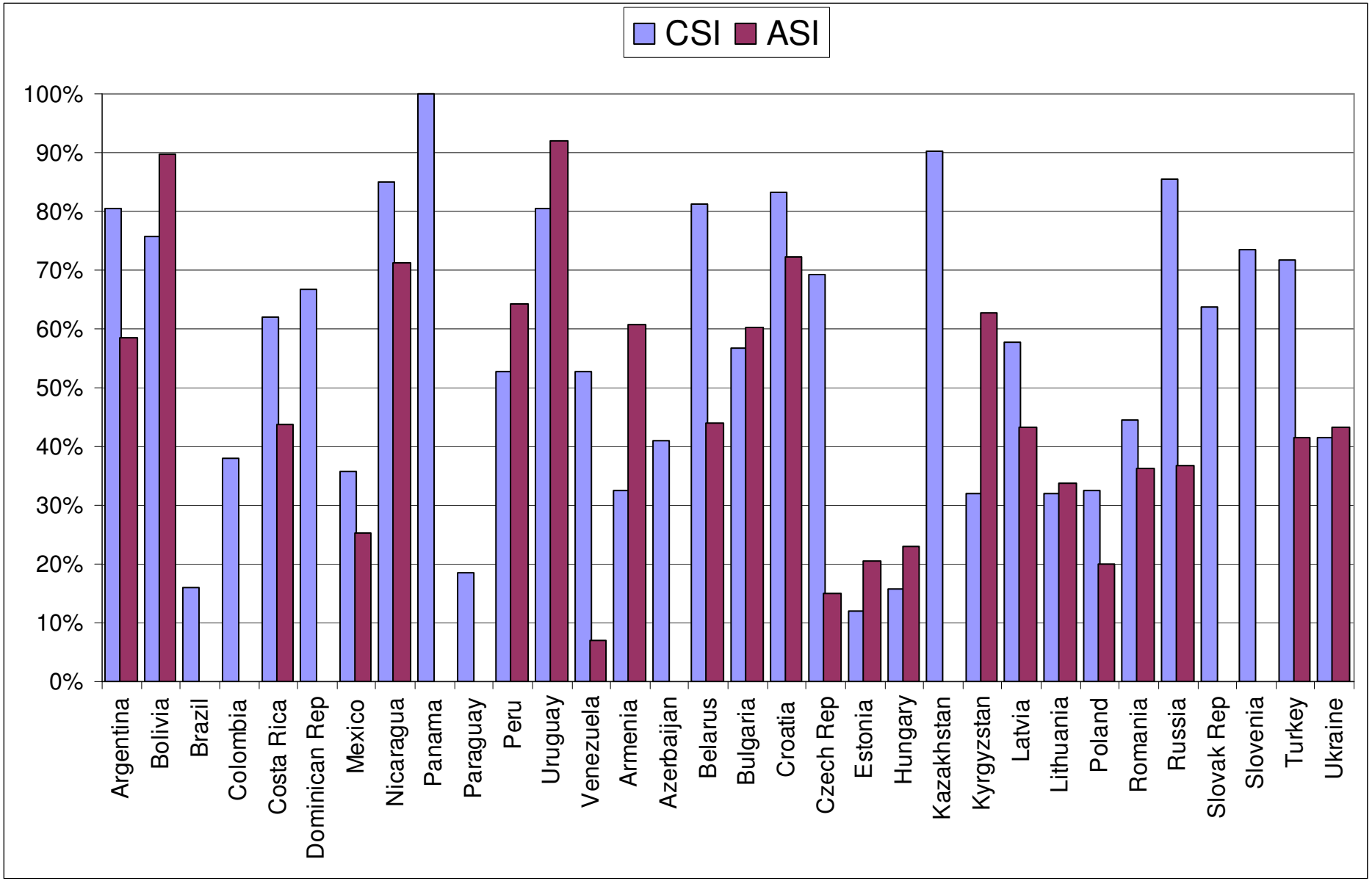
	Author's Calculations based on CMIR Estimates (1997/98) Per Capita $FCC (Dollars)	US Treasury Department, Informal Survey 2000 Per capita $FCC (Dollars)	International Financial Statistics Per capita $LCC (Dollars)
Argentina	1478	698	374
Bolivia	144		49
Brazil	15	6	108
Colombia		52	81
Costa Rica	209		130
Dominican Rep		188	98
Mexico		51	124
Nicaragua	135		25
Panama		648	0
Paraguay		18	85
Peru	67	185	50
Uruguay	762		199
Venezuela	104		93

Alternative Estimates Of Per Capita FCC Holdings In Various Transition Countries. 1997-2001. (Feige & Dean 2004)

Country	based on CMIR estimates (1999)	US Treasury Dept (2000) Informal Survey	ONB Survey	Feige (2002a) Denomination Displacement	Feige (2002a) Money Demand
	Dollars Only	Dollars Only	All Currencies	All Currencies	All Currencies
Armenia	10.6				
Azerbaijan	21.1				
Belarus	0.8	288			
Bulgaria	63.1	120			
Croatia			166	273	1386
Czech Rep			220		
Estonia	34.7				
Hungary	2.2		29		
Kazakhstan	288				
Kyrgyzstan	7.1				
Latvia	432	208			
Lithuania	24	139			
Poland	90	26			
Romania	10.3	52			
Russia	448	407			
Slovak Rep			148		
Slovenia			246		
Turkey	74.7	157			
Ukraine	23.9				

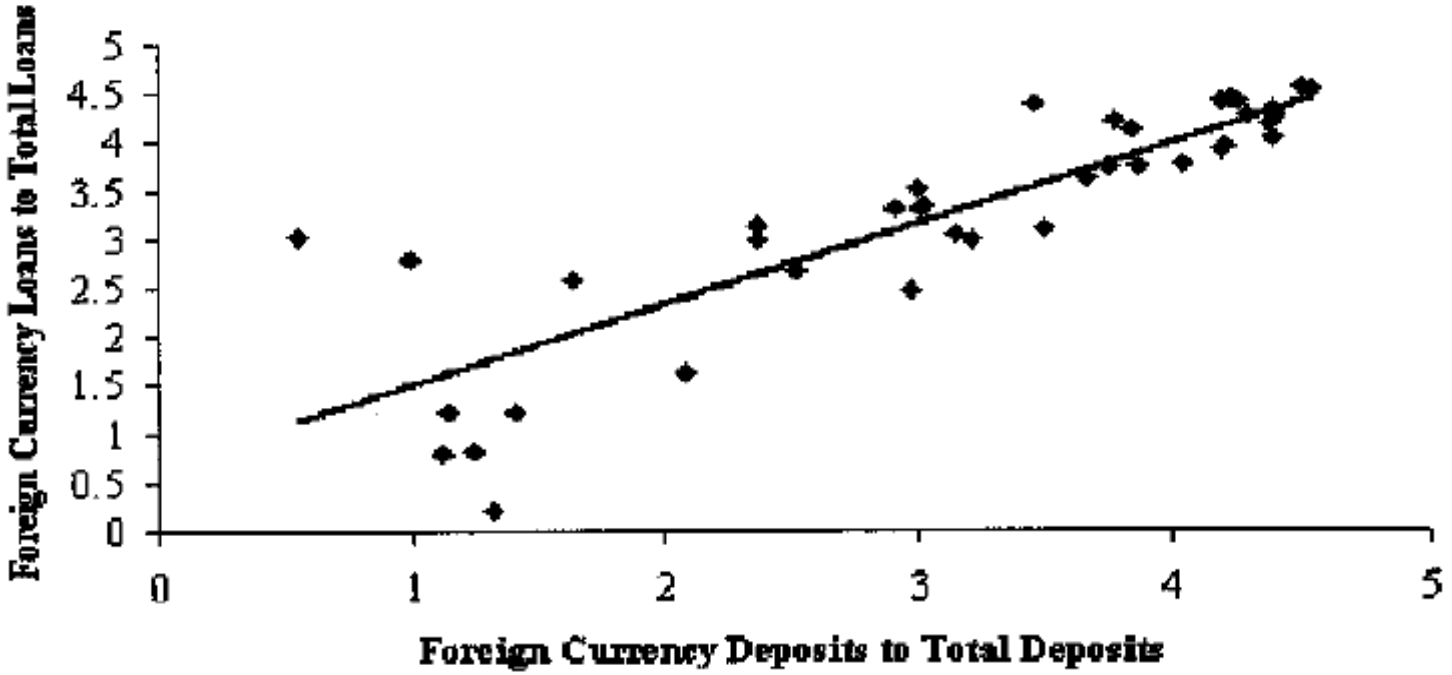


Source : Feige et al. (2002) for Latin American countries (1997?) and Feige & Dean (2004) for transition countries (1999)



Source : Feige et al. (2002) for Latin American countries (1997-1998 ?) and Feige & Dean (2004) for transition countries (1999)

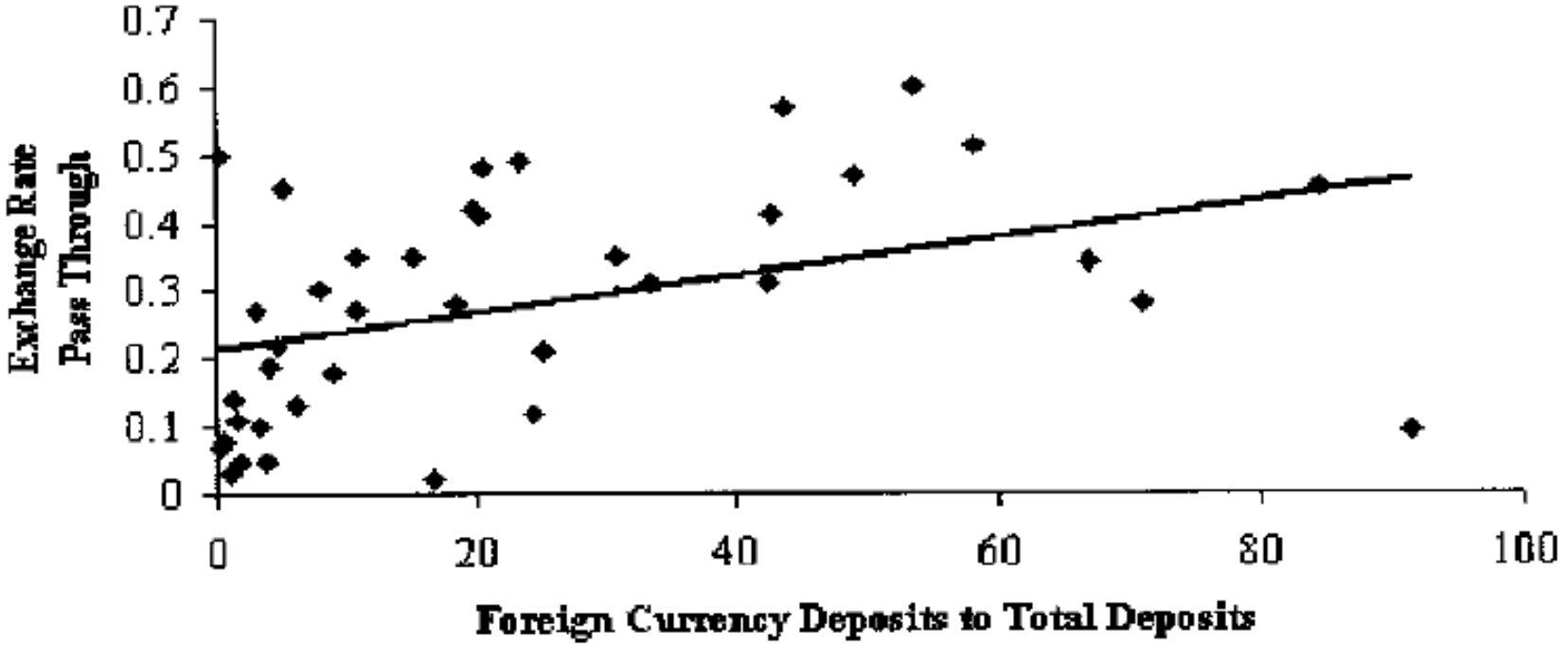
Deposit and Loan dollarisation (1990-2001)



De Nicolo, Honohan & Ize, IMF wp03/146

- 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)



De Nicolo, Honohan & Ize, IMF wp03/146

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)

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"

EXPLANATIONS

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

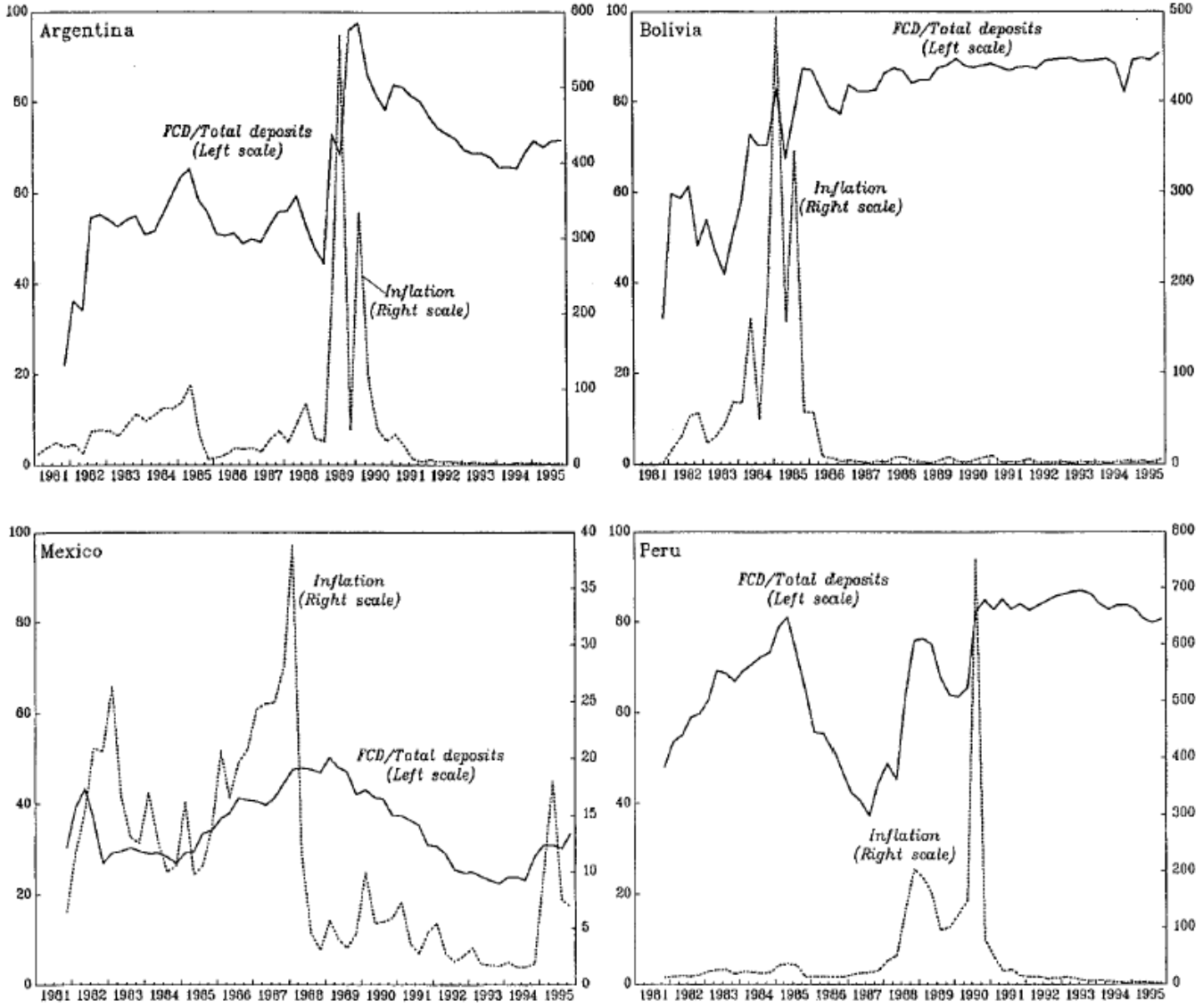
Persistence of large fiscal deficits → high inflation → dollarisation

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



Ize and Levy-Yeyati (2003)

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.
→ at moderate levels of inflation, there are two stable steady states (domestic currency only, both domestic and foreign currencies)
→ 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):

currency substitution depends on relative *nominal* rates of returns	asset substitution depends on relative *real* rates of return (and risks and risk aversion)

→ 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”

Mundell (1998): http://www.columbia.edu/~ram15/grash.html
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 portolio 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 ε)

e.g.: $1 + r_{\$} = (1+ r_{£}) [(1 – P) + P/(1+\varepsilon)]$

→ 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 expost optimal for the government.
→ borrowers anticipate this bailout (implicit debtor guarantee)

→ 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