

Dollarization : The Link between Devaluation and Default Risk

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Devaluation and Default Risk :

Plan of Presentation

- **Motivation**
 - costs and benefits of dollarization
 - the debate in Argentine
- **The Theory**
 - Balance Sheet Effects in Argentina
- **Estimating the Benefits of Dollarization**
 - Regression analysis
 - Event Studies
 - A “Simulation”
- **Evidence from Latin America and Europe**
- **Conclusions**

Motivation:

Costs vs. Benefits

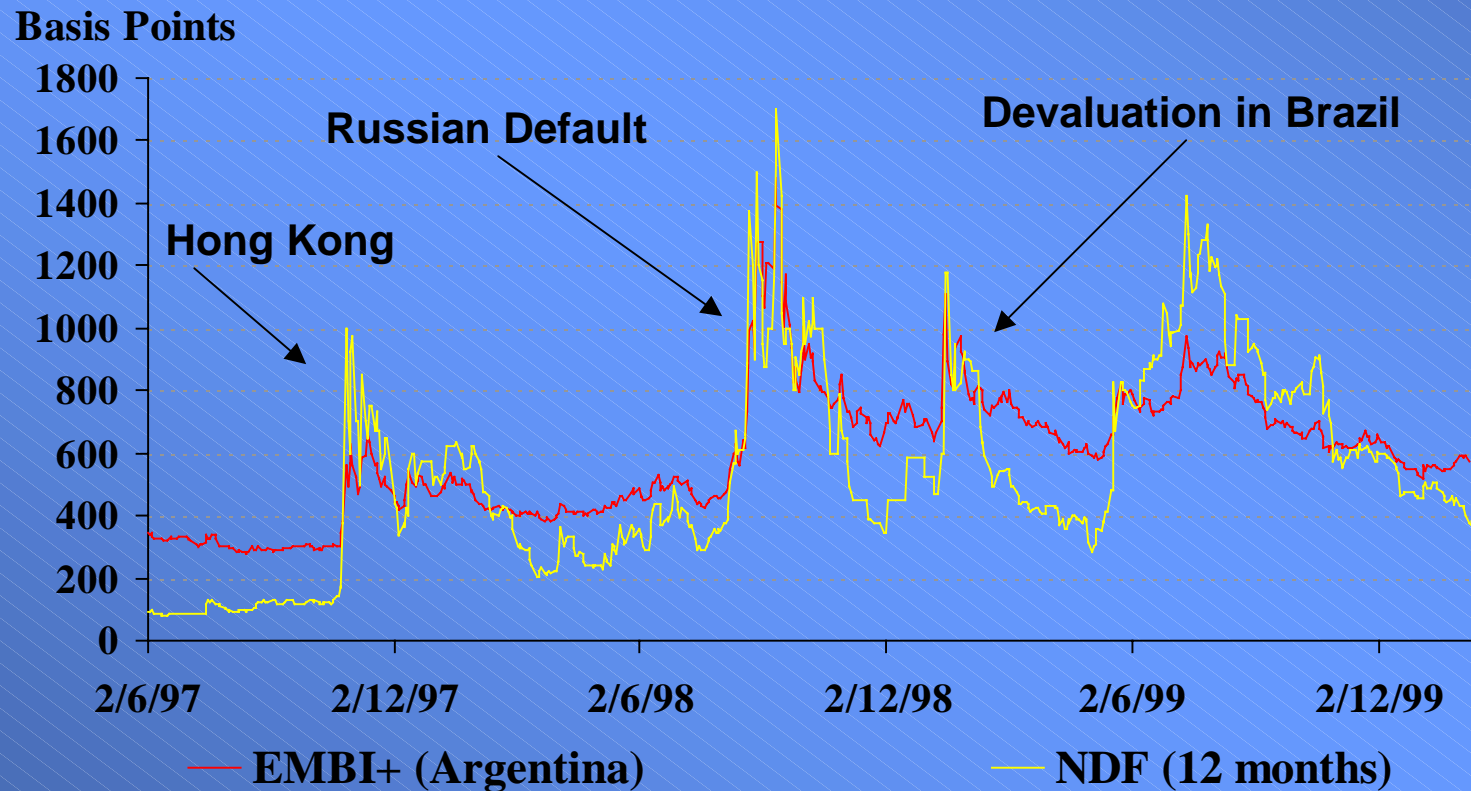
- **Seigniorage**
 - unilateral vs bilateral
- **Lender of Last Resort**
 - unilateral vs bilateral
- **Monetary Policy/
Option Value to Wait**
- **Sovereignty**
- **Lower Interest Rates**
 - in pesos and in US\$
- **Lower Volatility**
- **“Better Policies”**
- **Integration**
 - trade, finance & investment

Lower Interest Rates is the most tangible benefit but depends crucially on the relation between devaluation and default risk

Motivation : stages of the debate in Argentina

- **1989/90 - Currency Board vs. Dollarization**
- **1995 - Post Tequila**
- **1997/8 - The Asian Crisis and Russian Default**
- **1999 - The Post-Brazil Debate**

The Asian, Russian and Brazilian Crises: Devaluation Risk and Default risk



Correlation Coefficient: 0.9

**But, a Correlation
does not imply Causality!**

The Theory

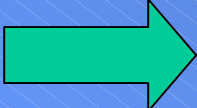
why might devaluation risk
cause default risk ?

- **“Contagion” Arguments**
- **Fundamental Analysis**

Contagion

- **At least one NY Analyst suggested**
 - **China would devalue**
 - **HK would devalue**
 - **Argentina would devalue**
- **Dollarization should eliminate such “contagion”**

Fundamental Analysis :

Devaluation Risk  Default Risk

There are at least two potential channels:

- **Greater devaluation risk may imply higher domestic interest rates leading to greater default risk**
- **a devaluation may have huge “balance sheet effects” due to currency mismatches increasing the likelihood of default**

Argentine Balance Sheet Effects

US\$ Mismatches (in bn. November 1999)

	Assets	Liabilities	Position
Public Sector	2,7	111,0	-108,3
Central Bank,1	25,8	8,9	16,9
Non-Financial Private Sector,2	191,9	144,2	47,7
Financial Sector	119,1	98,9	20,2
Total	339,5	363,0	-23,5

(1) Assets include international reserves + Argentine us\$ Government Bonds

(2) Assets include external assets + dollar denominated deposits in the financial system + AFJP assets + holdings of us\$ cash. Liabilities include external liabilities + dollar denominated loans of the financial system

This analysis is very partial as:

- 1. Argentina is fairly closed and the private sector runs a current account deficit.**
- 2. Within the Non-Financial Private Sector many may have a negative “stock mismatch”. i.e.: dollar wealth may be concentrated.**
- 3. Collateral values are largely in pesos, so balance sheet effects may be multiplied through a “credit channel”**
- 4. The above may cause severe problems in the Financial Sector**

Estimating the benefits of Eliminating devaluation risk

- **Regression Analysis (VAR)**
- **“Event Studies”**
- **A “Simulation” exercise**

Regression Analysis

eg: **Vector AutoRegression (VAR)**

Default Risk: EMBI+/Synthetic Bond Spread

Devaluation Risk: NDF/Bocon \$US/A. Peso Spread

VAR is a technique to attempt to sort out the interactions between potentially endogenous variables.

Regress X on Y and Y on X simultaneously

Vector Auto-Regression (VAR)

	Default Risk	Deval. Risk
Default Risk (t-1)	0.709 (0.024)	0.014 (0.029)
Deval. Risk (t-1)	0.048 (0.017)	0.884 (0.020)
Reserves/Mon.Base (t)	0.017 (0.006)	0.005 (0.007)
EMBIWARG (t)	0.224 (0.017)	0.037 (0.021)
US30YRS (t)	0.224 (0.052)	0.020 (0.062)
Constant	0.001	0.007

Standard errors in parentheses

Regression Analysis (VAR)

Results :

Shows dual “Granger type” causality.
Benefits significant, of order 120bpts.

Problems :

Results are not robust to alternative specifications.

Efficient Market Theory predicts immediate reaction to “news”. Results reflect differences in market efficiency or liquidity ?

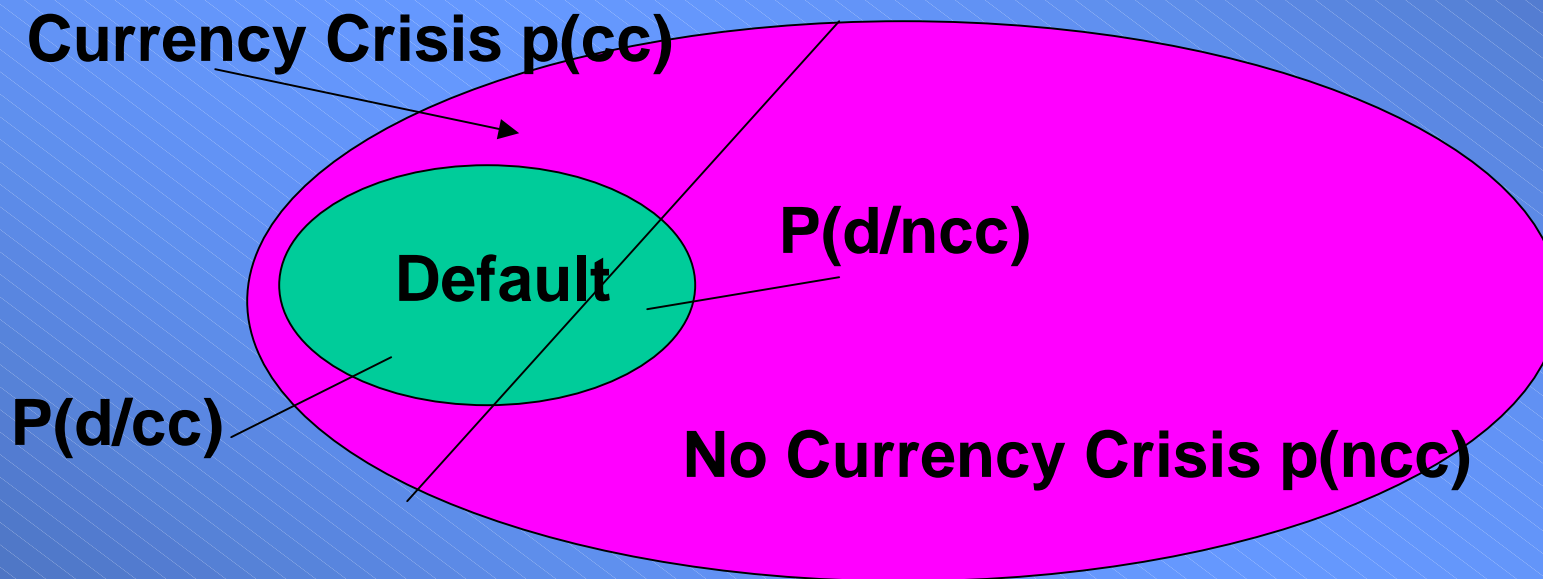
Event Studies:

Event	Δ Devaluation Risk	Δ Default Risk
Tequila (20/12/94)		
10 days before	107	110
10 days after	-52	221
Hong Kong (27/10/97)		
10 days before	872	287
10 days after	-500	-50
Brazil (14/01/99)		
10 days before	650	526
10 days after	-350	-129
Cavallo's FT Interview		
10 days before	465	176
10 days after	-60	111

Results: 1% devaluation risk \Rightarrow default risk 60bpts
 Eliminating devaluation risk \Rightarrow default risk 300bpts

Problem: Are we really picking up news on increasing devaluation risk separately from default risk news?

Theoretical Simulation Exercise a la Berg and Borensztein (1999)



$$d = p(d/cc) * p(cc) + p(d/ncc) * p(ncc)$$

Estimating the benefits of Dollarization

$$p(d/ncc) = \frac{d - p(d/cc) * p(cc)}{1 - p(cc)}$$

d : Default Risk (EMBI Spread)

p(cc) : Probability of Currency Crisis (NDF)

Assumptions regarding:

1. **p(d/cc)** : Probability of default given currency crisis

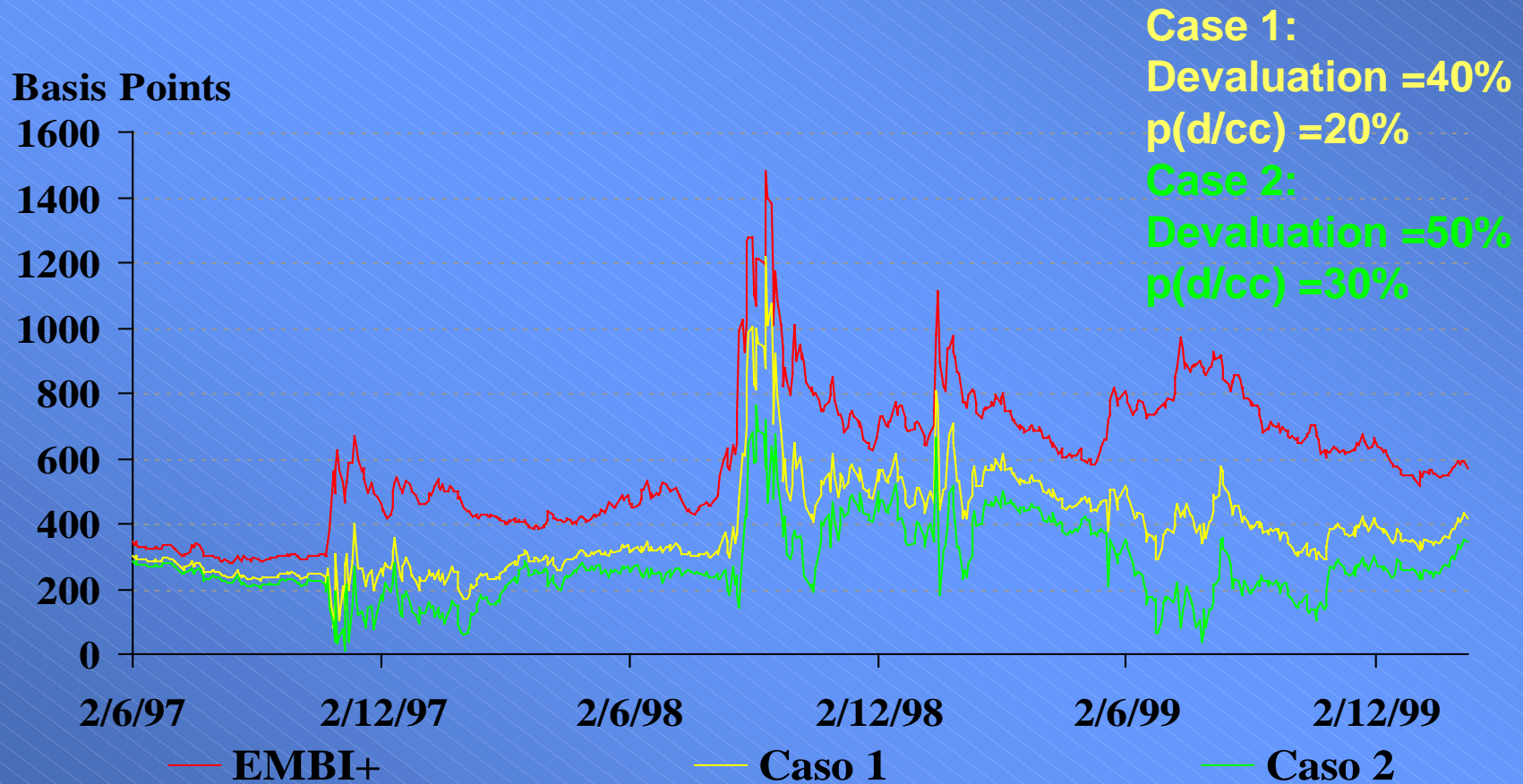
2. **Devaluation in event of currency crisis (to obtain p(cc) from NDF)**

Results using average data (Jun-97/Feb-99)

Reduction in Dollar Spread on Eliminating Currency Risk

EMBI+		Devaluation in event of Currency Crisis		
		30%	40%	50%
Probability of default in the event of a currency crisis	10%	65,1	50,2	41,8
	20%	286,8	221,9	185,6
	30%	499,7	388,4	325,6
	35%	594,4	461,7	387,4
	42%		594,4	498,2
	50%			594,4

But, the averages hide an interesting dynamic:



But, the averages hide an interesting dynamic :

	Average		Hong Kong		Brazil	
	Case1	Case 2	Case1	Case 2	Case1	Case 2
EMBI+ Spread	594,40	594,40	627,00	627,00	1111,00	1111,00
Reduction	212,78	323,03	393,00	595,40	351,33	652,12
Spread with no devaluation risk	381,61	271,85	233,98	31,60	759,67	458,88

Evidence from Europe

$$d = p(d/cc) * p(cc) + p(d/ncc) * p(cc)$$

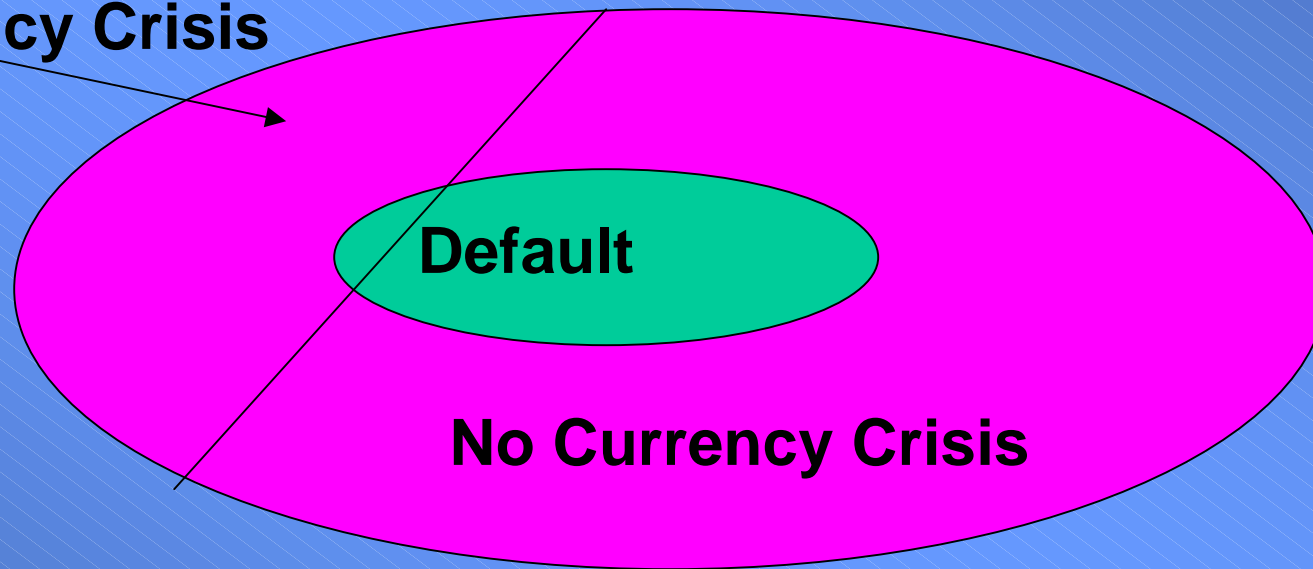
- **Argentina: $p(d/cc) > p(d/ncc)$ due to negative “balance sheet effects”**

Default Risk and Devaluation Risk are positively correlated

- **Europe: “Balance sheet effects” may be positive so $p(d/cc) < p(d/ncc)$**

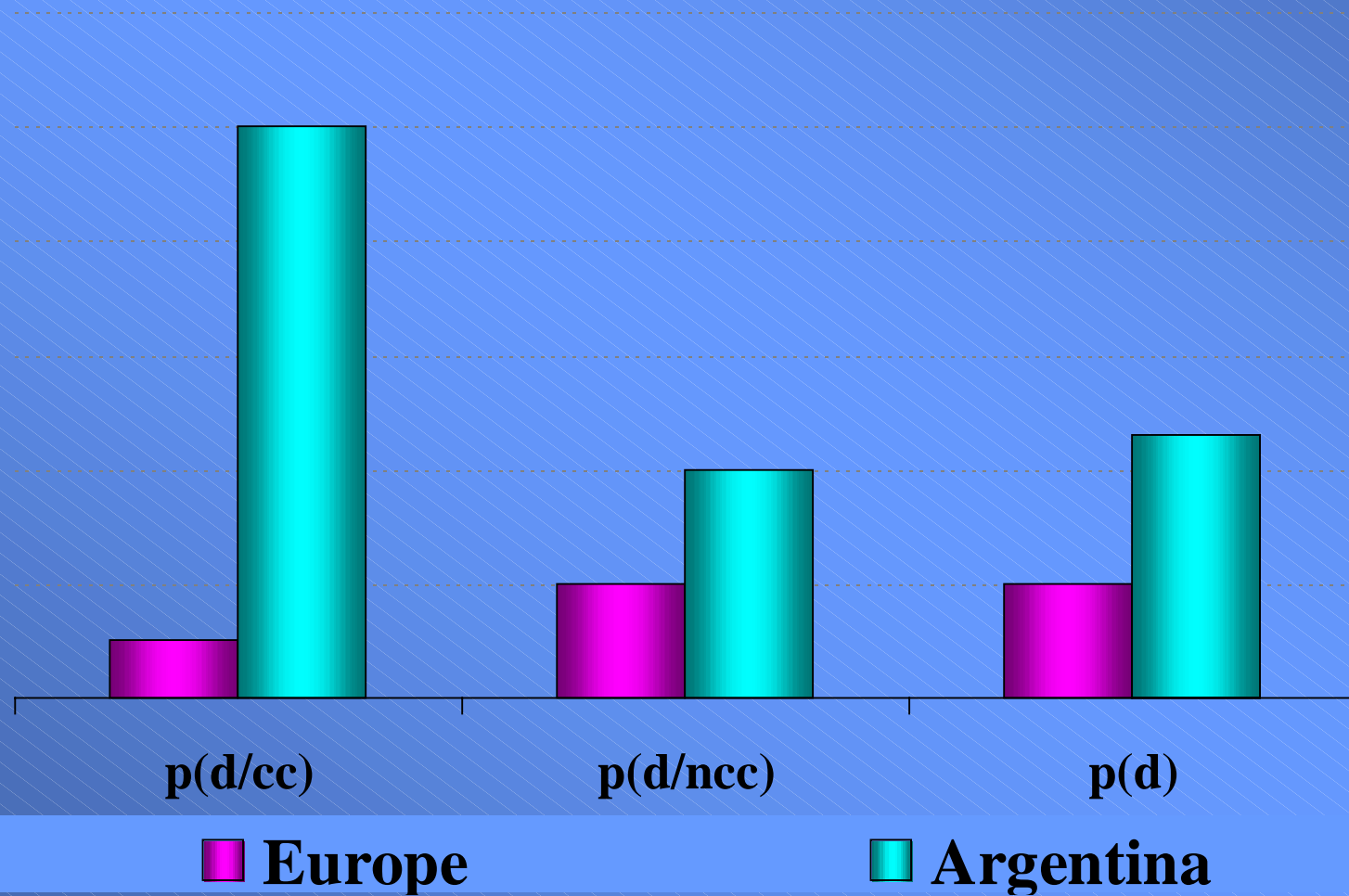
Europe

Currency Crisis



Correlation between default and devaluation risk ?

Europe vs. Argentina



Latin America vs Europe

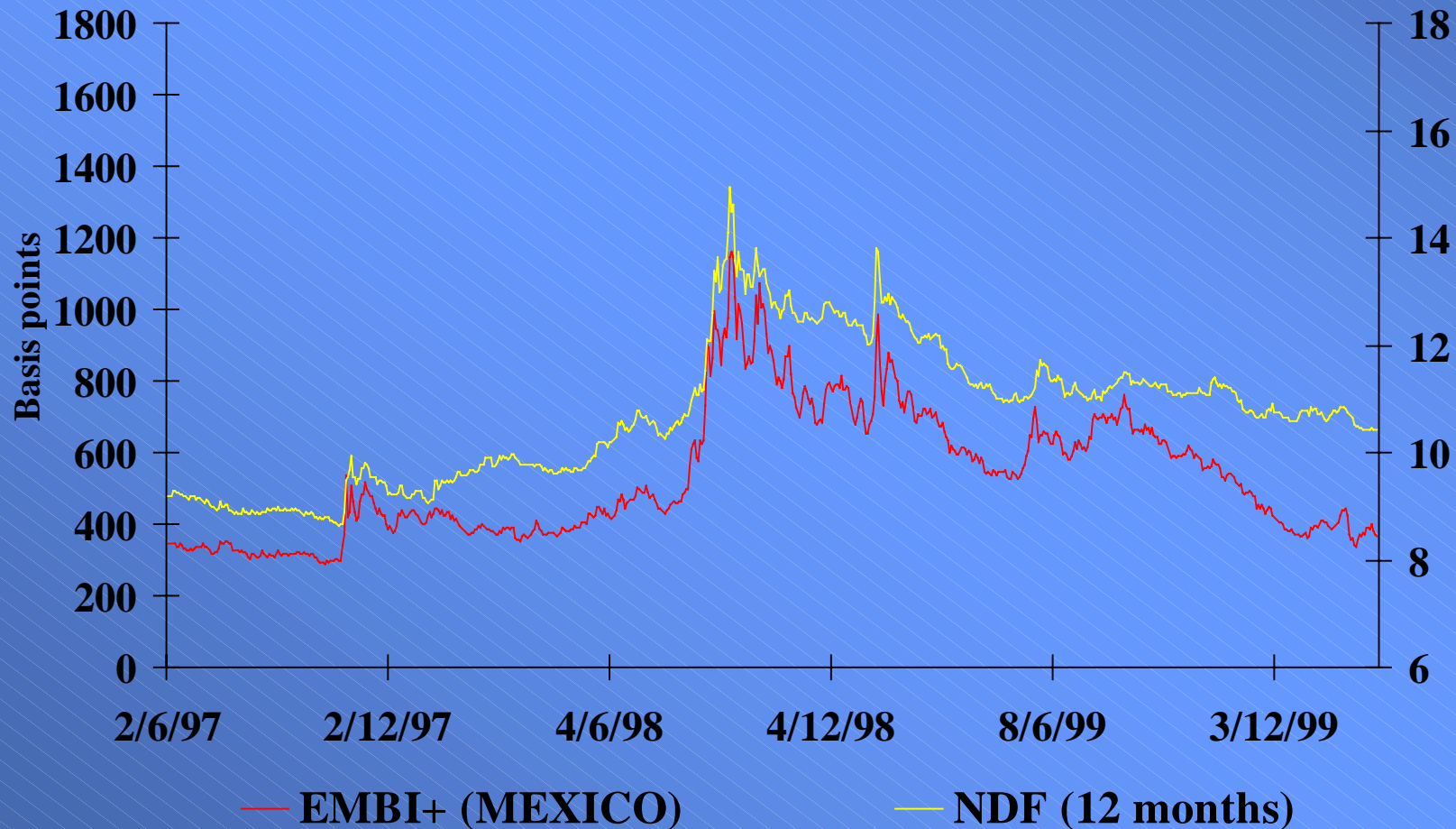
Correlation Coefficients

“Devaluation” vs Default Risk

Brazil	0.64	Italy	-0.22
Mexico	0.94	Sweeden	-0.36
Venezuela	0.80	UK	-0,71

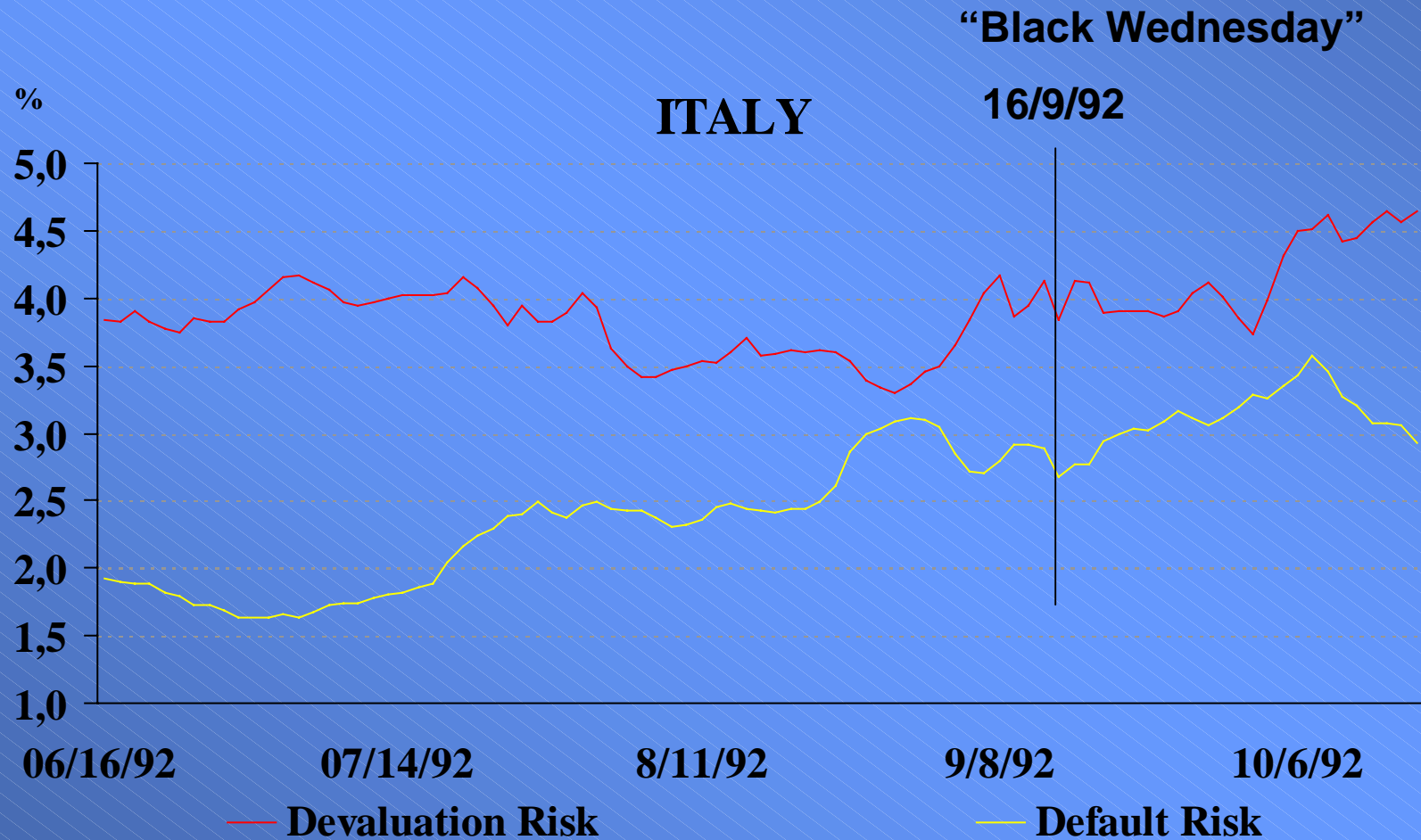
Data. Latin America: default risk is EMBI bond index spread vs. US Treasury, devaluation risk is NDF spreads over period Jun 1997 to February 2000. Europe: default risk is local DM bond vs. German DM bond, devaluation risk is local currency issue vs. Local DM issue except UK where devaluation risk measured with respect to ECU over period March 1991 - June 1993.

Mexican Expected Depreciation and Default Risk



Correlation Coefficient: 0.94

But, look at Italy during the 1992 ERM Crisis



Proposed Definition of “Original Sin” :

**A Positive Correlation between
Default and Devaluation Risk**

Conclusions: (1)

- **There is a strong link between devaluation and default risk in Argentina**
- **There are good theoretical reasons to believe in this link**
- **European experience appears to validate the “balance sheet” theory**

Conclusions: (2)

**reduction in default risk on
eliminating devaluation risk**

- **Regression Analysis (VAR)** up to 1.2%
- **“Event Studies”** up to 3.0%
- **“Simulation” exercise** 2.2%-3.3%

Estimated Benefits of a Reduction in Country Risk

Reduction in Country Risk (b. pts)	GDP Growth (%)	Employment (%)	Employment '000	Tax Receipts \$bn.	Interest	
					Payments (\$bn) 1 Year	St.State
200	2.2%	1.2%	150	1.0	0.24	2.1
300	3.2%	1.9%	220	1.7	0.36	3.1
400	4.3%	2.5%	300	2.0	0.48	5.0

Growth effects estimated directly, employment and tax effects estimated indirectly through effect on growth and interest payment effects are calculated using government debt amortizing in 1 year and total government debt (steady state).