Default Risk, the Exchange Rate and Income Fluctuations in Emerging Economies

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Discussed by Urban Jermann

• Contribution: Study predictions of small open economy model with defaultable bonds (Eaton and Gersovitz 1981) and two goods

• Theoretical results: Conditions under which default incentives are stronger with low output of tradables and nontradables

• Quantitative findings Model vs Argentina:

$\oplus$ Negative correlation interest rates and output

$\oplus$ High volatility of real exchange rates

$\oplus$ Negative correlation interest rates and real exchange rates

$\ominus$ Interest rates not volatile enough

$\ominus$ Current account not countercyclical

Model

Economy receives endowments $y \equiv \left(y^T, y^N\right)$, following Markov process. Agents maximize

$$E_0 \sum_{t=0}^{\infty} \beta^t u\left(c_t^T, c_t^N\right).$$

Benevolent government trades one-period bonds taking pricing function as given

$$q\left(B', y\right).$$

With risk neutral lenders, have in equilibrium that

$$q\left(B', y\right) = \frac{1 - \text{default-probability}\left(B', y\right)}{1 + r}.$$

Default is punished by temporary exclusion and direct output loss.

IID tradable endowments and autarchy punishment

Default incentives are stronger with low current output

With IID endowments, $q\left(B', y\right) = q\left(B'\right)$

Default only if have to make a payment on the debt, $\left[B - q\left(B'\right) B'\right] < 0$:

$$c^T = y^T + \left[B - q\left(B'\right) B'\right]$$

Default iff for all payments $\varepsilon \equiv -\left[B - q\left(B'\right) B'\right] > 0$, we have

$$u\left(y^T\right) - u\left(y^T - \varepsilon\right) > \beta E\left(v^o\left(B'\right)\right) - \beta E v^{autarchy}$$

Because of concavity: If somebody with y^{T*} defaults, then somebody with $y^T < y^{T*}$ and same B, defaults too

Related result:

IID NONtradable endowments and autarchy punishment: Default incentives are stronger with low current output if

$$\frac{\partial u\left(.\right)}{\partial c^{T}\partial c^{N}}<0$$

$\therefore$No such results for persistent endowments

Why are interest rates not volatile enough, and risk premia so small?

- Default is a rare event

Strongest motivation for default is high debt. But lender knows that, demands a high premium. With high premium do not want to accumulate high debt.

- Output shocks do not have strong impact on relative incentives to default and to honor debt.

What determines corr(y_t, r_t^c)?	–0.8626 (Argentina 1993-2003)

Current output relative to default risk!

- IID shocks, only tradable output, $B = 0$:

with low $y^T \rightarrow$ decrease B, increases default probability and increases r^c

- Persistent y^T

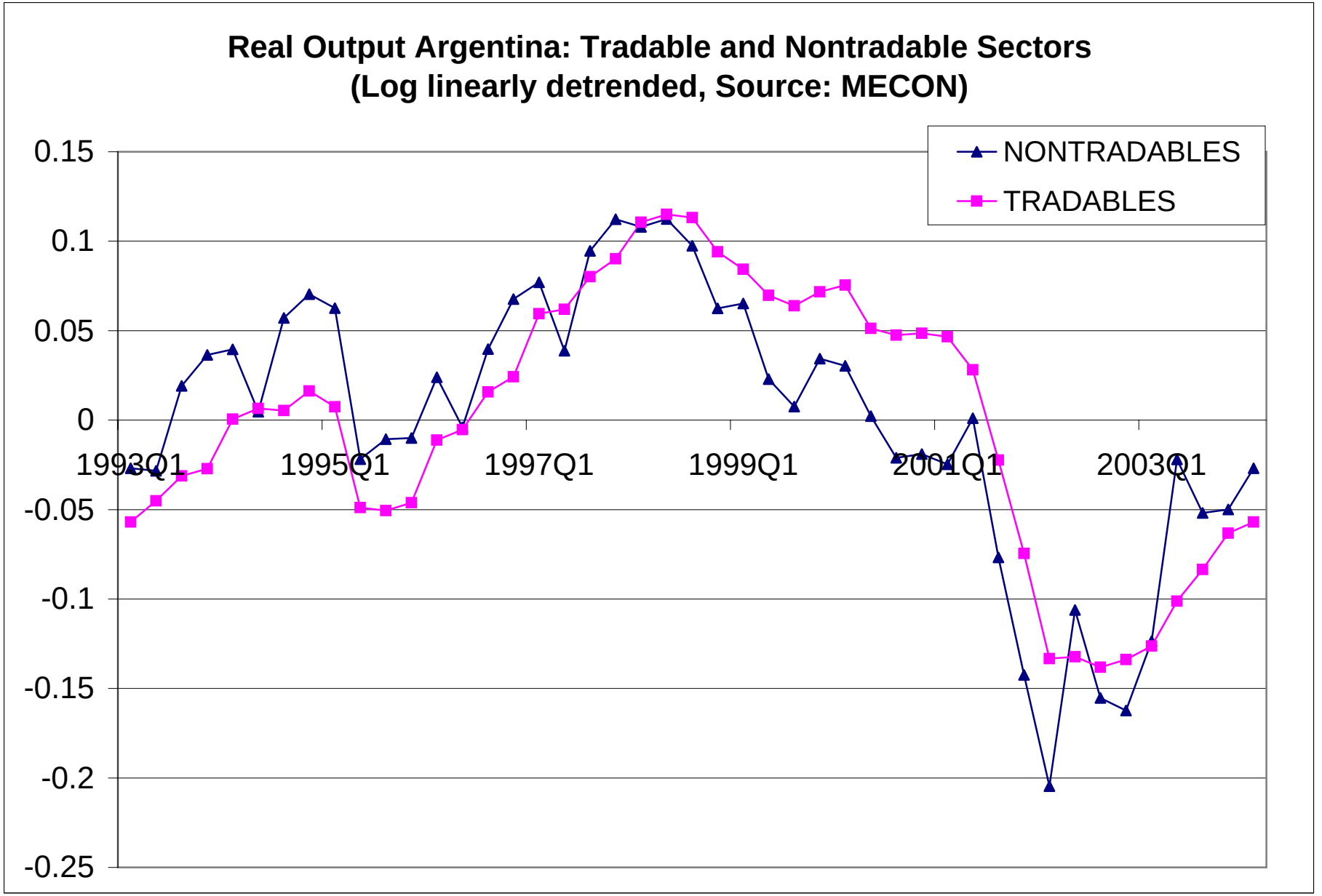
Model:

$$\begin{array}{rrcll} & \rho(y) & = & 0.4: & corr(y_t, r_t^c) = -0.3562 \\ [& \rho(y) & = & 0.8: & corr(y_t, r_t^c) = 0.1487 \quad] \end{array}$$

Calibration of endowment process

- $\rho(y) = 0.4$: *"which is the autocorrelation coefficient in the aggregate output series for Argentina"*

- *"Shocks to tradable and nontradable output are assumed to be independent"*


Real Output Argentina: Tradable and Nontradable Sectors
(Log linearly detrended, Source: MECON)
NONTRADABLES
TRADABLES
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
1993Q1
1995Q1
1997Q1
1999Q1
2001Q1
2003Q1

Calibration of endowment process

- $\rho(y) = 0.4$: *"which is the autocorrelation coefficient in the aggregate output series for Argentina"*

- *"Shocks to tradable and nontradable output are assumed to be independent"*

- Argentina 1993-2004Q1:

$$y_t^i = \rho^i y_{t-1}^i + \varepsilon_t^i,$$

$$\begin{aligned} \rho^N &= 0.86 \\ \rho^T &= 0.96 \\ \text{corr}(\varepsilon_t^N, \varepsilon_t^T) &= 0.71 \end{aligned}$$

Volatility of real exchange rates

- Real exchange rate equals consumer price index

$$p^c = w^T + w^N p^N, \qquad p^N = \left(\frac{1-\omega}{\omega}\right)\left(\frac{c_T}{c_N}\right)^{1+\mu}$$

$$std\left(\ln p^c\right) \approx$$

$$w^N\left(1+\mu\right)\sqrt{var\left(\ln c^T\right) + var\left(\ln c^N\right) - 2cov\left(\ln c^T, \ln c^N\right)}$$

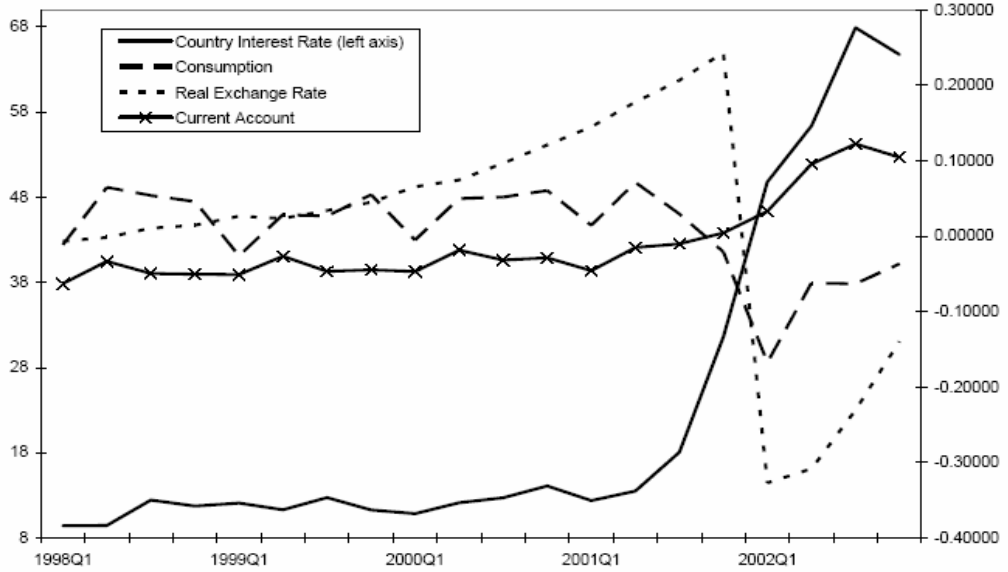
$$w^N\left(1+\mu\right)\sqrt{2var\left(\ln c^i\right)\left(1-\rho\left(\ln c^T, \ln c^N\right)\right)}$$

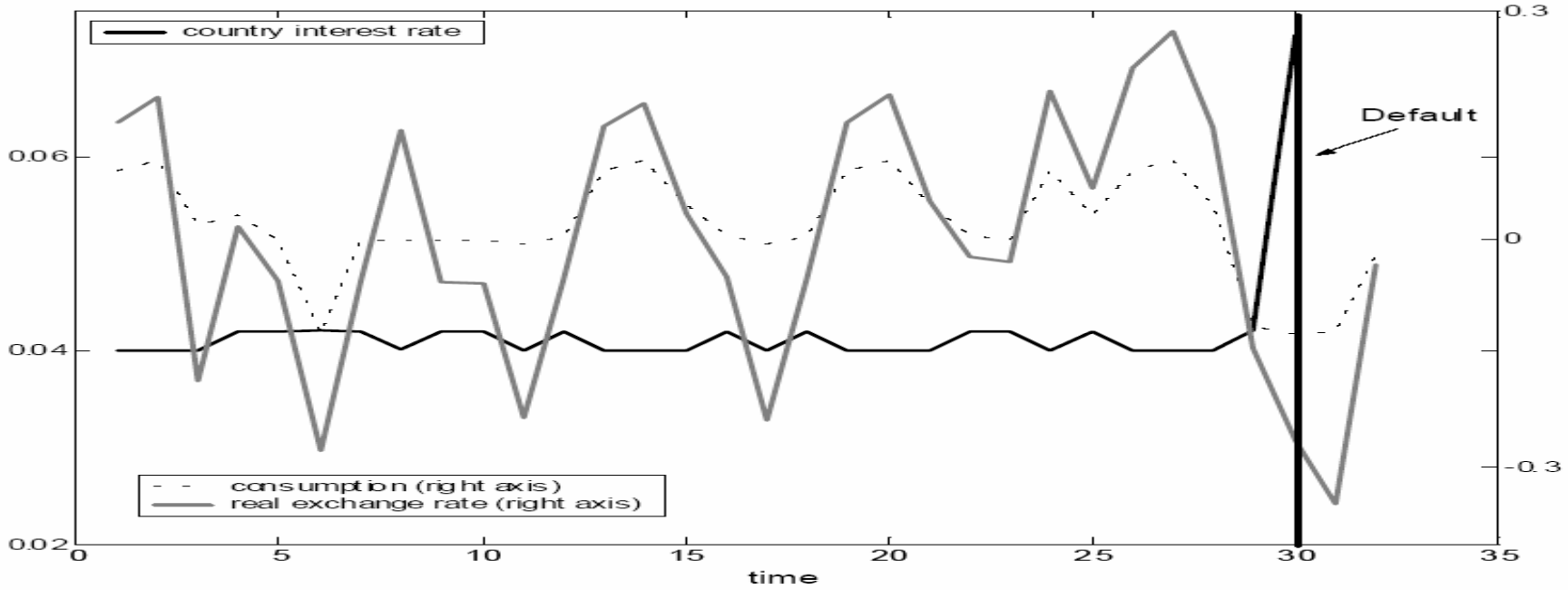
$$\begin{aligned}\sqrt{1-0.5} &= 0.7\\ \sqrt{1-0.7} &= 0.55\end{aligned}$$

Suggestions

- Focus on variances/covariances not most informative to study default: Event studies, and higher-order moments

Argentina 1998 - 2001





More recent work along similar lines

- Mark Aguiar and Gita Gopinath (2004):

Permanent output shocks: positively serially correlated growth rates

- Vivian Yue (2004):

Bargaining over debt reduction at default: endogenous recovery rates