**A GENERAL EQUILIBRIUMMODEL OF SOVEREIGN DEFAULT AND BUSINESS CYCLES**

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The three stylized facts of the business cycles and sovereign default are the following:

*FACT 1.* Default events are associated with deep recessions. On average, GDP and consumption fall about 5% below trend, and imported inputs and total intermediate goods fall nearly 20% below trend. Labor falls to a level about 15% lower than in the three years prior to the defaults. Net exports jump about 10 percentage points of GDP in the span of the two quarters before and after default events.

*FACT 2.* Interest rates on sovereign debt peak at about the same time as output hits its through and defaults occur, and they are negatively correlated with GDP.

*FACT 3.* External debt as a share of GDP is high on average, and higher when countries default. The mean debt ratio before default was 50%, and 72% at the time of default.

Foreign debt was one-third of GDP on average between 1998-2005. Poor countries had the highest average debt ratio about 100%, followed by Eastern European and Western Hemisphere countries with averages of about 50% and 40% of GDP.

The former models failed to explain the stylized facts of business cycles and souvereign debt, Mendoza and Yue proposed a dynamic general equilibrium model filling this gap. Their claim was that models of business cycles in emerging economies explain countercyclical country interest rates by modeling the interest rate as an exogenous variable (and default is exogenous). The authors made output and souvereign default endogenous via interaction of foreign lenders and domestic borrowers, firms and households.

Further assumptions of the model are:

Producers of final goods require working capital financing to pay for imports of a subset of intermediate goods.

Firms and the government are excluded from world credit markets when the country defaults.

The imperfect substitutability of domestic and foreign inputs imply an endogenous efficiency loss in production. The efficiency loss build in production and results an amplification of productivity shocks on output, when default occurs.

All in all, the model fits all the three stylized facts, but the aplification mechanism exaggregates the TFP shock on output and results approximatly by 80%, when the economy defaults. Moreover, consumptions became more volatile.A central implificantion of the amplification mechanism is that the output cost of default is an endogenous, increasing, and convex function of TFP.

Assumptions of the model:

The efficiency loss in final goods production that occurs when the country defaults, because final goods producers cannot finance the purchases of those inputs, and thus are forced to replace them with other imported and domestic inputs that are imperfect substitutes.

A central implication of the model’s financial amplification mechanism is that the output cost of default, which is a key determinant of default dynamics in the Eaton-Gersovitz class of models, is anendogenous increasing, convexfunctionof TFP. This differs sharply fromthe two approaches followed tomodel ad hoc costs of default in the literature.

Levy-Yeyati and Panizza(2011)

Tomz and Wright (2007)

Neumeyer and Perri (2005)

Uribe and Yue (2006)

models of business cycles in emerging economies explain countercyclical country interest rates by modeling the interest rate as an exogenous variable that represents the financing cost of both the government’s sovereign debt and firms’working capital loans.

In thesemodels, default is exogenous and hence facts (1) and (3) are left unexplained.

Assumptions of the model:

Producers of final goods requirew orking capital financing to pay for imports of a subset of intermediate goods.

Both firms and the government are excluded from world credit markets when the country defaults.

Third, the efficiency loss in final goods production that occurs when the country defaults, because final goods producers cannot finance the purchases of those inputs, and thus are forced toreplace them withother importedanddomesticinputs that are imperfect substitutes.

A central implication of the model’s financial amplification mechanism is that the output cost of default, which is a key determinant of default dynamics in the Eaton-Gersovitz class of models, is anendogenous increasing, convexfunctionof TFP. This differs sharply fromthe two approaches followed tomodel ad hoc costs of default in the literature.

Agents:

domestic households

domestic firms

domestic government

foreign lenders

- consumption at time t

- labour supply at time t

- strictly increasing, continously differentiable function

β- subjective discount factor ϵ(0,1)

u() – felicity function [continuous, strictly increasing, strictly concave, and satisfies the Inada conditions]

– wage rate at time t

- profit in final good sector

profit in intermediary good sector

- government transfer at time t

s.t.

Frisch elasticity

CRRA

Final good producers

- intermediary goods produced at time t

- labour demand of final good production at time t

– TFP shock at time t

domestic intermediary goods at time t

imported intermediary goods at time t

- - within elasticity across all variaties

Armington elasticity between and

price of the imported goods: time invariant and exogenous

imported input variaties

- risk free world real interest rate

Pay-in advance condition

where

FOC of the first stage

Second stage yields

, for j

, for j

, for j

for j j

Intermediary good producers

Equilibrium in factor markets

is the value of no default

is the value of default

Eq.

s.t.