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Endogenous debt crises[☆]

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ABSTRACT

We distinguish two types of debt crises: those that are the outcome of exogenous shocks (to productivity growth for instance) and those that are endogenously created, either by self-fulfilling panic in financial markets or by the reckless behavior of "Panglossian" borrowers. After Krugman, we characterize as "Panglossian" those borrowers who only focus on their best growth prospects, anticipating to default on their debt if hit by an adverse shock, rationally ignoring the risk of default.
We apply these categories empirically to the data. We show that, taken together, endogenous crises are powerful explanations of debt crises, more important for instance than the sheer effect of growth on a country's solvency.

1. Introduction

International debt crises are (very) costly. Why do we observe that so many countries fall into their trap? Should we not expect more prudent behavior from such countries? The theoretical answer in fact is: it depends. Take the simplest form of financial crisis driven by an exogenous shock. Spreads on sovereign bonds are high because the country is expected to be vulnerable to an earthquake or to a long-lasting commodity shock that is beyond its control. The country should then indeed behave with increased prudence: the greater the debt the country might have to repay, the heavier the cost of the

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earthquake relative to a favorable state of the nature. Yet, on the other hand, if the expected earthquake is so large that the country knows that it will actually default on its debt, then a "Panglossian attitude" (as Krugman, 1998, has coined it) may become rational: the debt will lose all value after the earthquake, and it would then be absurd not to have borrowed more beforehand. The country then behaves as if the risk of unfavorable shocks can be ignored. Following Dr. Pangloss, the character of Voltaire's book *Candide*, the country acts as if only "the best of all possible worlds" will occur. In this case, debt endogenously leads to debt; we call this the *self-enforcing* case.

Let us now consider the case when crises are driven by the lack of confidence of financial markets towards a given country, making the country financially fragile through self-fulfilling behavior. Self-fulfilling debt crises have been analyzed in different forms. In the model of Cole and Kehoe (1996, 2000), self-fulfilling crises are a variant of liquidity crises, by which a lack of coordination among creditors leads a solvent country to default. As argued by Chamon (2007), however, such crises can readily be avoided when lenders manage to offer contingent loans of the kind organized by venture capitalists: if any individual creditor offers a line of credit, conditionally on other creditors following suit, then liquidity crises can be easily avoided.

Self-fulfilling crises have also been analyzed as the perverse outcome of a snowball effect through which the buildup of debt becomes unmanageable, out of the endogenous fear that it can indeed become unmanageable (Calvo, 1988). Relying on an intuition developed in a simpler model in Cohen and Portes (2006), we show that snowball spirals can only occur in cases where a debt crisis has the potential of damaging the fundamentals of the indebted country. If a crisis reduces the GDP of a country by say 10%, then it is clear that the lack of confidence toward a country can degenerate into a self-fulfilling crisis. If instead the fundamentals are not altered by the crisis, we show that self-fulfilling crises of the Calvo type are (theoretically) impossible.

At the end of this argument, we chose to focus on a simple characterization of a self-fulfilling debt crisis as one that is the outcome of an endogenous weakening of the country's fundamentals. In the self-fulfilling case so defined, it is the crisis that reduces the GDP, originating from the various disruptions that a weakening of the confidence in a country may bring about (capital flight, exchange rate crisis …). In the "earthquake case," the sequence of causation is inverted: the fundamentals are first destroyed, then the crisis occurs.

From the theoretical model that we present, a simple typology of cases is obtained. Below a critical level of debt, a country tends to act prudently, aiming for instance to reduce its debt in response to a permanent adverse shock. Past a critical level of the debt-to-GDP ratio, which can be the outcome of a sequence of repeated unfavorable exogenous shocks, the country will begin to behave in the Panglossian mode, rationally ignoring the bad news, increasing the level of debt to its upper limit in a self-enforcing process. A crisis may then occur either because of the occurrence of another adverse exogenous shock, or because of a self-fulfilling shock, one that endogenously weakens the ability of the country to service its debt.

The data is analyzed with this type of typology in mind. We use a slightly modified version of the database that has been compiled by Kraay and Nehru (2006), which we updated to cover all debt crises that have occurred until 2004. Following and adapting the work of these authors, we first show that the likelihood of a debt crisis is well explained by three factors: the debt-to-GDP ratio, the level of real income per capita, and a measure of overvaluation of the domestic currency.

In order to estimate the risk of a self-fulfilling debt crisis, we then distinguish the law of motion of the debt-to-GDP ratio in normal times from the motion triggered by the onset of the crisis. We define a self-fulfilling crisis as one that would not have happened, had debt-to-GDP simply been driven along the pre-crisis path. We find that self-fulfilling crises, so defined, correspond to a small minority of cases. On average, between 6% and 12% of crises (depending on the methodology) appear to be self-fulfilling. This proportion is clearly not negligible, however, and deserves to be taken seriously.

We also calibrate the strength of the Panglossian effect. We show that countries do appear to have behaved as if the distribution of the risk was truncated, leading the country to ignore risk. The influence of this mechanism on the debt buildup is tested through Monte-Carlo simulation. We show that it is substantial and representing about 12% of the cases (see Arellano, 2008, for similar insights applied to the case of Argentina).