

Partial Default

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In emerging market economies, sovereigns frequently miss payments on their debt, but almost always by only a fraction of the amount due. During these partial defaults, sovereigns continue to pay some of the debt, continue to borrow at higher-than-normal rates, and accumulate the defaulted debt as arrears until resolution. Some of these partial defaults take the form of protracted episodes associated with rising default and debt, and deeper recessions. The standard theory assumes that default is total, rather than partial, and that it is followed by a period of exclusion without any borrowing, further default, or accumulation of arrears taking place. Default in that paradigm is resolved with a reduction of debt. In this paper, we propose a theory of partial default more in accord with the evidence.

A central idea in our theory is that partial default is an alternative way to effectively borrow and inter-temporally transfer resources. As with standard borrowing through markets, partially defaulting raises current resources and increases future liabilities as most of the defaulted debt accumulates. Unlike standard borrowing, however, partial default does not have the acquiescence of the lenders and is associated with future resource costs. A main implication of our theory is that partial default is an amplifying force for debt crises. A country that misses payments will be in worse shape going forward because it will experience rising debt as the defaulted payments accumulate and any new borrowing occurs at high interest rates. This theory is capable of rationalizing the large heterogeneity in partial default, its comovements with economic outcomes, and rising debt during default episodes. In our theory, as in the data, large defaults are associated with higher interest rate spreads, higher debt levels, deeper recessions, and longer default episodes.

We define partial default as the fraction in arrears of current debt payments due by sovereigns. We document the properties of partial default using data for 38 emerging markets since 1970. We find that sovereigns default often, with varying intensity and duration, missing their debt payments about one third of the time. During these events, often only a small fraction of the payment is missed; in about half of these events, less than 30% of the promised payments are missed. Default episodes vary in duration, with many lasting less than 2 years but some on occasion lasting much longer, over 30 years. Debt-to-output ratios feature a hump-shaped pattern during default episodes, and these episodes are typically not associated with a net reduction in debt. As a default episode

starts, debt-to-output rises from 35% to 40%, in the middle of the episode debt reaches an even larger ratio of 47%, and debt falls to 36% towards the end of the default episode. We also find that partial default is systematically correlated with other outcomes of the debt crisis. During small defaults (those belonging in the bottom quartile of the distribution) sovereign governments miss on average 3% of payments, interest rate spreads are about 7%, debt-to-output ratios are about 37%, and output is at trend. During large defaults (those in the top quartile) in contrast, governments miss about 82% of their payments, face interest rate spreads of about 15%, debt-to-output ratios are 63%, and output is about 6% below trend. Large defaults are also associated with longer default episodes.

Our framework consists of a sovereign government in a small open economy that borrows via long-term bonds, can choose to partially default on its debt payments, and faces a stochastic stream of income. The government can choose when to start the default episode, the intensity of partial default every period, and when to end the default episode. The defaulted debt is accumulated at a rate that depends on a recovery factor parameter. This accumulated defaulted debt comes due in the future. Default is also costly because it induces future resource costs that depend on the intensity of the default. The government can also raise resources by borrowing through markets. Borrowing is always possible, even during default episodes. Expected default losses, however, are more elevated during default episodes, which increases interest rates and can deter borrowing altogether. This framework implies varying debt haircuts and maturity extensions that depend on the endogenous default episode length and intensity of the default.

We estimate the model by targeting moments that summarize the empirical distribution of partial default and the behavior of interest rate spreads, debt, and output in emerging markets. The estimated parameters include the ones characterizing the default cost function as well as the debt recovery factor. We show that our over-identified model matches the target moments well and delivers the empirical distribution of debt and partial default, including the presence of many small defaults.

The parameterized model contains additional implications, consistent with the data, for the correlations of partial default with other variables, as well as for the length of default episodes, and debt haircuts and maturity extensions resulting from default episodes. In the model and the data, small defaults tend to be shorter and are associated with lower interest rate spreads, lower levels of debt, and smaller recessions, while large partial defaults are longer and associated with higher interest rate spreads, higher levels of debt, and deeper recessions. Our model matches the data in that it delivers a hump-shaped pattern for debt to output during episodes. During default episodes, debt continues to rise in the model, and default episodes do not result in a net reduction of the debt burden. Default episodes in our model also result in sizable debt haircuts and maturity extensions with magnitudes similar to those in the data.

We perform two counterfactual experiments that relate to policy discussions around resolution mechanisms for sovereign defaults. In the first counterfactual, we eliminate the possibility of borrowing during default episodes and argue that, in our model, this policy is similar to adding more stringent *pari passu* clauses to the bond contracts. This application is motivated by the fact that in the baseline model borrowing during default episodes implies differential haircuts to lenders because bonds issued later in the episode experience fewer periods with partial default compared to bonds issued earlier. Such differential treatment violates *pari passu* clauses. In the second counterfactual, we decrease the debt recovery factor on defaulted debt. This counterfactual

implements higher debt relief policies within our model, as in the Highly Indebted Poor Countries initiative proposed by the International Monetary Fund and the World Bank. Our analysis of these counterfactuals suggests that *pari passu* clauses lead to lower default frequency, shorter default episodes, and smaller debt haircuts from defaults. Debt relief initiatives that increase haircuts, reduce the incidence of large defaults, reduce debt levels, but also decrease debt sustainability.

This paper modifies the standard paradigm present in most of sovereign default models. In standard theory, default is the culmination of the crisis and is followed by an impasse period with no debt repayment or borrowing, after which the economy reemerges making a fresh start with reduced debt. The focus of that theory has been on the dynamics prior to the default and has not been designed to study life during default episodes. Emerging economies, however, spend more than a third of the time in default episodes, and hence abstracting from these periods misses a large part of the dynamics. In our theory, we integrate the dynamics prior to default with the dynamics occurring during default episodes.