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The "Mystery of the Printing Press" Monetary Policy and Self-fulfilling Debt Crises

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Giancarlo Corsetti[1,2,3], Luca Dedola[2,4] [i]

[1]Cambridge University; [2]Centre for Economic Policy Research; [3]Centre for Macroeconomics; and [4]European Central Bank

What are the conditions and mechanisms that enable a central bank to stem disruptive speculation in the sovereign debt market-a striking example of an effective backstop to government debt being the Outright Monetary Transactions (OMT) program launched by the European Central Bank in September 2012? In this paper, we develop a model in which sovereign default can be driven by either self-fulfilling expectations, or weak (economic and political) fundamentals, and analyze the mechanisms by which either conventional or un- conventional monetary policy can rule out the former. Both the government and the central bank are assumed to maximize social welfare acting under discretion. Fiscal authorities choose distortionary taxation and whether to default on public debt, by imposing explicit "haircuts" on debt holders (outright repudiation). Conventional monetary policy is modeled as a standard choice of money supply and inflation, and unconventional policy as outright purchases in the debt market.

We first lay out in detail how multiple equilibria emerge when fiscal policy lacks commitment. Equilibria with self-fulfilling default can occur only when the level of public debt falls in an intermediate, "vulnerability" range. In this range, if investors expect the government to default, they bid high interest rates on public debt, irrespective of macroeconomic fundamentals. The government in turn finds default a preferable option to the alternative of running highly distortionary surpluses and meet the increased cost of servicing the debt. This very mechanism also underlies belief-driven crises in economies with non-indexed debt (denominated in national currency), if the central bank only relies on conventional monetary policies. The ability to debase public debt with inflation surprises and generate seigniorage revenue cannot rule out self-fulfilling default. However, it may affect the range of debt for which the economy becomes vulnerable to it.

We then introduce unconventional policies, by which the central bank can decide to purchase government debt, while simultaneously issuing interest bearing reserves. Monetary authorities are (realistically) assumed to stand ready to honour their own liabilities — but not necessarily government debt — by redeeming them for cash (fiat money) at their face value. Thus, by purchasing government paper, the central bank effectively swaps default-risky public debt for its own liabilities with a guaranteed face value, subject only to the risk of inflation surprises. As a result, central bank interventions reduce uncertainty and the overall cost of debt service, altering the trade-offs faced by the discretionary fiscal authority.

On a sufficient scale, central bank purchases can keep the cost of servicing the debt below the level at which default would become a preferred policy option, even in the absence of fundamental fiscal stress, relative to the alternative of raising the primary surplus. We characterize the minimum threshold for debt purchases above which there is no equilibrium with self-fulfilling default. We show that (i) close to this minimum threshold, a monetary backstop does not eliminate default due to fundamental fiscal stress; (ii) a backstop cannot have strongly adverse consequences on the future inflation choices by the central bank
-since welfare losses from deviating from optimal policy would ultimately make monetary authorities unwilling to intervene.

These findings are important in light of widespread concerns that, on the one hand, the central bank may not have the ability to expand its balance sheet on a sufficient scale to effectively backstop government debt. On the other hand, even if a backstop rules out belief-driven crises, large-scale purchases of government debt may foreshadow large losses on the central bank balance sheet, forcing monetary authorities into running suboptimal inflation policies. To rule out belief-driven sovereign default, central bank purchases neither have to match the full scale of the government financing, nor have to guarantee the government in all circumstances, at the cost of high inflation.

Three crucial conditions underlie our results. Firstly, a monetary backstop is successful to the extent that the central bank is able to issue liabilities at a lower interest rate than the government. The gist of the argument is most easily understood referring to a situation in which the relevant (risk-free) nominal interest rate is at its lower bound, and the central bank is able to issue fiat money at will to buy government paper, without any impact on current prices. To the extent that markets price the risk of non-fundamental default in sovereign rates, these purchases arbitrarily reduce the cost of servicing the debt and thus eliminate any self-fulfilling equilibria (because fiat money is subject only to inflation risk). However, to avoid undesirable inflation developments, appropriate fiscal and monetary policies are required in the future to deal with the increased monetary stock. Our model of unconventional monetary policy can be viewed as an extension to the case in which central bank liabilities are issued at the equilibrium interest rate — namely, at a rate consistent with expectations of future inflation.

Secondly, monetary policy making cannot be itself a source of multiple equilibria in inflation and interest rates, thus undermining any welfare gains from a monetary backstop. Namely, conditional on a realized haircut, inflation rates should be uniquely determined, ruling out the possibility of high interest rates and taxation in the presence of sound fiscal fundamentals and no default.

Lastly, a successful monetary backstop is greatly facilitated when the fiscal and monetary authorities share the same objective function. Provided that fiscal and monetary authorities are both benevolent (i.e. they both maximize social welfare), a monetary backstop is effective under reasonably mild conditions, even when the central bank is held responsible for its own balance sheet losses, barring contingent fiscal transfers. While in this case the two authorities would act independently without

consolidating their budget constraints, the optimal discretionary plan internalizes the effects of own policy choices on overall distortions.

The main conclusions from our analysis resonate with the widespread policy view that under appropriate conditions, a central bank has indeed the power to backstop the government debt, although for different reasons that many observers invoke. Specifically, our results are at odds with views often voiced in the public debate, claiming that the central bank can act as 'a lender of last resort to the government' because it is not subject to an (intertemporal) budget constraint. These views stress, alternatively, that a central bank can always de- base its liabilities by a bout of unexpected inflation, or consolidate its liabilities and force private banks to hold them indefinitely. In light of our analysis, both views have fundamental weaknesses. The inflationary-debasement view down- plays the social costs of running high inflation, historically conducive to financial and macro instability. Since inflation rates are higher in the case of default, the paper rather emphasizes that an effective monetary backstop prevents high (let alone runaway) inflation, rather than creating price instability.

The alternative view, stressing the need for the central bank to impose financial repression over private banks by forcing them to hold reserves, de facto introduces the possibility of default on monetary liabilities, without however working out its consequences. If the central bank is expected to tamper with its liabilities, it is easy to see that the arbitrage condition relating the rate on monetary liabilities and the risk free rate would have to include terms in the anticipated central bank's haircut: the optimal monetary policy would have to account for the optimal haircut on the holders of reserves. The logic of self- fulfilling beliefs would then apply to a discretionary central bank as well as to the government, extending the results in the paper to the case of central bank interventions.

Although our analysis is carried out in closed economy, it bears lessons for a currency union. As already mentioned, a common objective function among fiscal and monetary authorities, and some fiscal support to the central bank (if only limited to financial stress situations) greatly enhance the ability of a central bank to provide a monetary backstop. In a monetary union among essentially independent states, it may be possible that national governments pursue different, inward-looking objectives and/or be adverse to extending large-scale fiscal backing to the common central bank. Our analysis, however, suggests that the conditions under which a common central bank has the ability to engineer a successful backstop to member states are fairly unrestrictive. This is especially true if, as is the case for the OMTs, governments can benefit from the backstop only provided they agree to strict conditionality, ensuring stability of public finances and possibly eliciting stricter cross-border cooperation.

[i] "The views expressed in the paper are our own, and do not reflect those of the European Central Bank or its Executive Board, or any institution to which we are affiliated."