A note on debt and economic activity

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Abstract

This note explores how debt flows may have an effect on economic activity. Crucially, banks are not viewed as mere financial intermediaries but as agents who create and lend money to borrowers without reducing anyone's holdings of money in the process.

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1. Introduction

In the years since the Global Financial Crisis of 2008, interest in the relationship between debt and economic activity has markedly increased. A growing body of empirical research suggests that measures of private debt, relating both to its level and to its rate of change, are powerful predictors not only of the occurrence, but also the duration and severity of financial crises.[2] What's more, large debt build-ups seem to result in economic recessions via a negative effect on aggregate demand, in what can fairly be described as a Keynesian mechanism (Mian and Sufi 2010, 2014).

While the notion that high levels of private indebtedness may lead to macroeconomic trouble is certainly not new (Fisher 1933, Minsky 1977, 1986), it has never been at the forefront of the discipline. As has been noted elsewhere, financial factors have far more often than not been absent from macroeconomic models over the post-war period (Borio 2014). Albeit the last few years have seen a renewed interest in models where debt plays a prominent role (Eggertsson and Krugman 2012, Guerrieri and Lorenzoni 2011, Midrigan and Philippon 2011), it is important to ask ourselves why debt has not been more prominent in macroeconomic analyses until now.

The reason, I submit, has much to do with the usual conception of debt as involving a transfer of money (or, in a number of theoretical models, a transfer of real resources) between a creditor and a debtor, with banks playing the role of simple financial intermediaries. If we build our understanding on this foundation, debt flows will tend to have no effect at the macroeconomic level since every dollar paid by a debtor will be received by a creditor. Setting aside debt owed to foreigners as a first approximation, this would normally leave aggregate demand unaffected. In the words of Eggertsson and Krugman (2012, p. 1471), "debt is money we owe to ourselves" - meaning, money we owe to other people who are part of the same economy.

The central point I wish to make is that a better understanding of how debt and economic activity interact at the macroeconomic level necessitates a different, and I would argue superior, conception of debt. The idea that something is amiss with the way in which debt contracts are conceived in standard economic models may be received with scepticism; after all, their basic structure is simple and corresponds well with our personal experience of borrowing or lending money among family and friends. As with so many other economic concepts, however, what seems natural in the analysis of private affairs may lead to falsehood if applied indiscriminately at the level of a whole country (pace Smith). Most debt in any modern economy is owed to banks, and bank debt is not to be viewed as the result of mere transfers between creditors and debtors - just as banks are not to be viewed as mere intermediaries in the process.

A long tradition in economics has emphasized the role of banks as creators, not intermediators, of money; pointing out that banks are not transferring funds from bank depositors to bank borrowers but handing borrowers newly-created money in the form of bank deposits.[3] If, over the last few decades, economists have to a large extent abandoned this framework, it has not been

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[2] The most convincing studies using nations as the unit of analysis are Schularick and Taylor (2012) and Jorda et al. (2013). See also Glick and Lansing (2010) and IMF (2012).

[3] See, for instance, Smith (1776, pp. 316-317), Keynes (1930, pp. 20-21) or Schumpeter (1934, pp. 98-99). These two opposing views on the nature of bank debt are related to the two views on the nature of money, as discussed (among many others) by Goodheart (1998).

guided by the observation of reality. It would be indefensible to claim that the money we receive on our bank account when being granted a loan has actually been taken out of somebody else's bank account - in other words, transferred from a bank depositor. Banks simply create a deposit on our name for the amount of the loan - as no other deposits are affected the money supply is increased. The equality between assets and liabilities is maintained as banks simultaneously create a new asset, our loan, to match the increase in their liabilities. It is of minor relevance that banks will indeed need to attract outside deposits to "fund" this new loan once the loan is spent (i.e. once the deposit just created is run down). At the aggregate level, it is precisely the newly created deposits which will fund new loans, as deposits may travel from bank to bank but will not leave the banking system.

This simple change in our conception of bank debt - as resulting from the creation, and not transfer, of money - has profound implications on its macroeconomic consequences. Debt flows are no longer simple relocations of purchasing power within the economy producing no aggregate demand effect on a first approximation. Instead, the granting of a new loan expands the overall amount of purchasing power - leading to consequences that will depend on how the rest of the economy reacts to monetary injections. Equally important, debt repayments entail the disappearance of money from the system - as the bank account of a debtor is being debited without anybody else's account being credited. This last point is crucial: the repayment of a bank loan does not transfer money to anybody in the economy - not to bank depositors and certainly not to the bank. Banks simply eliminate an asset (the loan) and a liability (the borrower's deposit) of the same amount. Since the borrower's deposit is money, money is being destroyed.

While far from new, the above insights have rarely been explored in the recent wave of theoretical contributions on the subject of debt and economic activity. It may well be that, given their unfamiliar feel, they are perceived as not amenable to formal analysis. I see no reason for that to be the case, and make the point by incorporating this view of debt contracts into standard economic modelling in what follows.

2. A model

Consider a continuum of households of measure one deriving utility from the consumption of goods and from their holdings of real money balances. Households produce a certain amount of goods, which we denote Y_1, and inherit from a previous generation a certain amount of money, M_0, and a certain stock of debt in the form of bank loans, L_0. Both money and debt are measured in nominal terms, while production and consumption are measured in units of the consumption good, whose price is P_1. Money is entirely in the form of bank deposits, and these deposits are the only item on the liabilities side of banks' balance sheet. Conversely, loans are the only asset that banks hold, so that $M_0=L_0$.

As my aim is to focus on the direct effects of debt flows on aggregate demand, I choose to abstract from the numerous ways in which debt may influence the evolution of the economy over the medium to long term. In particular, the model features no capital, so that loans cannot be used to increase productive capacity. I also abstract from assets whose purchase may be financed by

loans, such as houses or firm equity, therefore avoiding the possible existence of credit-fuelled asset bubbles. Instead, I only consider loans given to households for the purpose of consumption.

Banks are treated as a single profit-seeking enterprise. They may grant new loans to households by creating new bank deposits, as mentioned in the previous section. As a first approximation, I assume that banks face no constraints on their money-creation abilities.[4] Bank loans last forever and a nominal interest rate of r must be paid each period on the stock of outstanding loans. This interest rate must be paid starting from the period in which the loan is granted. I assume that banks pay no interest on deposits, so interest income equals total profits for the banks. Bank owners, who are treated separately from all households, will use these profits for consumption only.

Households decide on their optimal amount of consumption, real money holdings and new loans in order to maximize utility. Households live for one period and pass their debt and money holdings to the next generation of households. Alternatively, households could be assumed to live forever but be completely myopic, discounting all future utility flows with an infinitely large discount rate. Their optimization problem can then be written as follows:

$$\max_{C_1 M_1} \ C_1^\alpha \left(\frac{M_1}{P_1}\right)^{1-\alpha} \qquad (1)$$

subject to:

$$Y_1 + \frac{M_0}{P_1} + \frac{\Delta L_1}{P_1} = C_1 + \frac{M_1}{P_1} + r\frac{L_1}{P_1} \qquad (2)$$

Equation (1) is a standard Cobb-Douglas utility function with real money balances where M_1 is the amount of money in the hands of the public at the end of the period. Equation (2), the budget constraint, has on its left hand side all available funds in real terms and on its right hand side all uses of funds in real terms. Notice that, even though we face a representative household, neither changes in the stock of debt (ΔL_1) nor interest payments (rL_1) are equal to zero. New debt is acquired from banks through money creation, while interest payments belong to the banks.

Since households only care for the present period, borrowing an additional unit of money will always increase utility provided that r < 1. Assuming this condition is met, banks may decide on the amount of new loans that maximizes their profits, as households will be happy to borrow as much as they can.

The solution to the above optimization problem is straightforward and results, after noting that $\Delta L_1 = \Delta M_1$ and $L_1 = M_1$, in the following two conditions:

$$C_1 = \frac{\alpha}{1-\alpha}\frac{M_1}{P_1} \qquad (3)$$

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[4] Of course, banks face some constraints to their money-creation abilities in the form of financial regulations such as reserves or capital requirements. As the build-up towards the Global Financial Crisis amply demonstrates, such constraints are of limited importance in practice.

$$C_1 = Y_1 - r\frac{M_1}{P_1} \qquad (4)$$

Notice that, in equation (4), $r\frac{M_1}{P_1}$ corresponds to interest payments on outstanding loans and therefore equals the profits of the banking sector. As these profits are spent entirely on consumption, the equation implies that the goods market is in equilibrium.

If we assume flexible prices and an exogenously given level of output, the model may be easily solved for the level of real balances and household consumption. I do not develop this solution here as it eliminates by assumption any relationship between debt and economic activity.

Of more interest is the solution under the assumption of a fixed price level and an endogenously determined level of output - in other words, under Keynesian assumptions. We may substitute (3) into (4) and solve for Y_1, resulting in:

$$Y_1 = \frac{\alpha}{1-\alpha}\frac{M_1}{P_1} + r\frac{M_1}{P_1} \qquad (5)$$

The right-hand side of equation (5) is aggregate demand: the sum of household consumption and bank owners' consumption. Both of these elements are proportional to real balances, and real balances are proportional to the money supply if prices are fixed. As new loans expand the money supply, bank lending will have a positive effect on economic activity. Noting the fixed price level as $\bar{P}$ and $M_1 = M_0 + \Delta L_1$, the solution of the model is:

$$Y_1 = \frac{\alpha + (1-\alpha)r}{1-\alpha}\frac{M_0 + \Delta L_1}{\bar{P}} \qquad (6)$$

$$C_1 = \frac{\alpha}{1-\alpha}\frac{M_0 + \Delta L_1}{\bar{P}} \qquad (7)$$

This solution shows that changes in the amount of outstanding bank debt have a direct and positive effect on economic activity and consumption. It follows that episodes of debt deleveraging, when $\Delta L_1 < 0$, will produce economic recessions. It is worth emphasizing that this does not happen because of any difference in preferences between bank debtors and bank creditors, as for instance in Eggertsson and Krugman (2012). Debt deleveraging has a direct effect on aggregate demand as it forces debtors to consume less than their income without for that reason increasing anyone else's consumption capacity in the process.

Of course, the above analysis cannot explain the occurrence of debt deleveraging in the first place. We may, as much of the recent literature, simply assume an exogenous financial shock reducing the maximum level of leverage that banks are willing to allow (Eggertsson and Krugman 2012, Guerrieri and Lorenzoni 2011). While future research ought to shed more light on how such a shock could come about, the aim of the present paper is simply to show that debt deleveraging unleashes powerful recessionary forces by taking money out of circulation - an event which would not fail to affect even the most confident economy.

3. Concluding remarks

We have much to gain by considering banking as the business of lending newly created money - not as the business of transferring money between depositors and borrowers. Following the Global Financial Crisis of 2008, Economics has come under pressure to deliver a better understanding of how the financial and real sides of the economy interact. This note highlights a promising avenue for future research, and makes some initial inroads in this direction.

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