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Macroeconomics and Credit Markets

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Credit markets play a surprisingly limited role in traditional macroeconomic theory. Dominant thinking about financial markets focuses almost exclusively on the supply and demand for money, the level of interest rates, and the determination of prices and expected prices. While these variables are important, other relatively neglected aspects of financial markets play a key role in macroeconomic theory and policy-making.

In this article we note that households and firms make intertemporal commitments in credit markets, and we argue that these commitments significantly affect macroeconomic performance. The first section presents the basic behavioral issues behind our thesis. We emphasize the importance of bankruptcy and the threat of insolvency. In the second section, we analyze the macroeconomic significance of recent changes in financial market contracts and debt commitment levels. In the conclusion, we discuss the policy consequences that follow from recognizing the importance of institutional arrangements in financial markets.

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Macroeconomic Adjustments and Intertemporal Commitments

According to the conventional wisdom of macroeconomics, given enough time, recessions should be self-correcting. As illustrated in the aggregate supply and demand framework, economic slack puts pressure on wages and prices to fall. As they fall, short-run aggregate supply increases. Aggregate demand also rises as the real money supply increases. The faster wages and prices fall, the smaller will be the real output loss that follows contractionary shocks. If wages or prices are sticky, real output can decline in the short run. But as nominal variables adjust to their long-run equilibrium, the system returns to its "natural" full employment state.

This conventional wisdom can change significantly when we recognize the widespread existence of intertemporal payment obligations in financial markets. These commitments take many forms. In this section, we explain how financial obligations affect macroeconomic performance by considering the effects of one type of commitment—debts with contractual payments fixed in nominal terms. The next section describes how different forms of these commitments affect the macroeconomic properties of the economy.

The basic theoretical issue is that falling prices will not necessarily stimulate an increase in aggregate demand when firms and households have extensive nominal payment commitments.[1] A decline in the price level causes a proportionate decline in nominal cash flow. Nominal cash commitments, however, remain unchanged initially because they are contractually fixed. This means that the "margin of safety" for debt payments declines because cash commitments consume a larger proportion of cash flows.

When prices vary, changes in the real value of nominal debt obligations affect the real wealth of both debtors and creditors. Because the variation in debtors' real wealth exactly offsets the variation in creditors' wealth, many economists have argued that this phenomenon has no effect on aggregate demand.[2] But a closer look at financial market relationships indicates that there are solid economic grounds for believing that a decrease in the margin of safety for payment obligations can reduce aggregate demand.

It is widely agreed that debtors have an incentive to avoid bankruptcy because they would face substantial costs from limitations on future credit and from distress sales of their illiquid assets. Moreover, since incomes and expenditures have uncertain components, debtors seek to maintain a cash flow margin of safety to protect them from the cost of insolvency. Although debtors have little control over price de-

clines that squeeze their margins of safety and increase the probability of default, they can improve their situation by reducing discretionary expenditures. This "cash flow effect" reduces debtors' expenditures when prices fall.[3]

The debtors' expenditure reduction during financial distress will not necessarily be offset by a symmetric increase in creditor expenditure. In fact, falling prices can also lead to creditor behavior that reduces aggregate demand. First, creditors may find that many of their loans are to firms or households incapable of meeting payment commitments. Furthermore, slack business conditions reduce the value and liquidity of collateral. Faced with such a situation, creditors, particularly credit intermediaries with nominal liabilities, react by channeling more funds into relatively safe liquid assets, such as government bonds, rather than financing investment projects or purchases of consumer durables.[4] This "flight to quality" changes the relative price of assets. The higher price (lower interest rate) for safe assets will not stimulate much additional expenditure, especially since the safe assets are primarily government obligations that are inelastic in supply. The lower price (higher interest rate) for risky assets used to finance investment and consumer durables will reduce expenditure, because demand for such financing is much more sensitive to interest rates.

There is a second channel through which creditor behavior can reduce aggregate demand. Credit intermediaries provide a real service to the economy by matching savers with borrowers. If credit intermediaries cannot perfectly distinguish the higher risk borrowers from the lower risk ones, then they will find that channeling funds to a pool of borrowers becomes riskier and thus more costly when debtor financial margins of safety fall. Credit intermediaries may be unable to pass on this increased cost because higher interest rates may deter only the lower risk borrowers. This adverse selection problem may cause credit intermediaries to respond to falling financial margins of safety by rationing the quantity of their services. Consequently, aggregate demand is reduced as credit becomes more limited.[5]

It is, of course, possible that if prices fall well below what creditors and debtors had expected, creditors would renegotiate new long-term loans to debtors with payment terms that recognize the lower price level. Creditors are unlikely to take this step, however, without first demanding that debtors slash their discretionary expenditures and attempt to meet the agreed payment commitments. After this occurs, and if debtors are still unable to meet their commitments, then creditors may be forced into rescheduling rather than face a wave of bankruptcies. But experience indicates that the new repayment terms will require continued austerity measures on the part of the debtors, given creditors' reluctance to extend their exposure to such risky debtors.

Note that our results have the novel characteristic, quite at odds with the conventional wisdom, that rapid deflation (or "disinflation") following a negative demand disturbance may be *bad* for the economy. This is because the reduction in prices cuts nominal cash flows while nominal payment commitments remain contractually fixed. The consequences for macroeconomic theory can be quite significant if the cash flow effect swamps the more familiar Keynes and Pigou effects so that a declining price level, on net, *reduces* aggregate demand.[6]

Credit Relations and Macroeconomic Performance

The analysis to this point shows that the "cash flow effect" linking aggregate spending to financial conditions can significantly alter the behavior of firms and households. The particular structure of credit relations in the economy determines how this result affects the performance of the economy as a whole. It is this issue that we consider now.

We begin by analyzing the effects of changing indebtedness levels in the U.S. economy. The cash flow effect will be more important the greater the payment commitments relative to the cash flow available to service them. Thus, rising indebtedness makes the economy more sensitive to changes in aggregate demand and financial conditions. There is substantial evidence of a recent build-up of debt in the U.S. economy. The ratio of debt to net worth for nonfinancial corporations has risen dramatically. The recent wave of leveraged buy-outs will certainly reinforce this trend. There is also concern about the high level of consumer installment credit and increasing second mortgage activity.[7] These trends indicate that the economy will be more sensitive to changes in cash flow and other shocks to the financial system.

Macroeconomic performance is not only affected by changes in the volume of debt, but also by changes in its maturity. Long-term debt has both advantages and disadvantages with regard to the stability of the system. Long-term debt contracts cause problems because they lock borrowers into nominal payment commitments for an extended period. Suppose that a long-term contract is based on high inflation expectations. Subsequently, an unanticipated change in demand reduces inflation to a level well below agents' previous expectations. This will reduce the nominal cash flows, and, as discussed above, will reduce aggregate demand and output.

If long-term debt is prevalent, this effect will persist. The incorrect

expectations embodied in the cash payment commitments will affect behavior for the duration of the contract. In an economy in which debt is predominantly short-term, however, debts and payment commitments can be re-contracted quickly, so the debt structure can more readily adjust to the lower price level.

Long-term debt contracts also have an advantage: they amortize principal payments over a long period. Therefore, the cash payment commitments per period for long-term debt will be smaller than those for short-term loans of the same size and at the same interest rate. When nominal margins of safety are squeezed, long-term liabilities give debtors more flexibility to reduce expenditures moderately, over a long period. But when debts are short-term, a reduction in nominal cash flow makes the threat of insolvency more immediate, forcing sharper initial expenditure cuts. Thus, the initial decline in aggregate demand will be more severe, other things equal, if liabilities have relatively short maturities. The conclusion is that in an economy with long-term debt, the real effects of a deflationary demand shock will have greater *persistence*. However, when debts are financed with predominantly short-term liabilities, demand-induced contractions are likely to be more *severe*.

How is this analysis relevant to recent developments in the U.S. economy? A salient feature of business debt over recent years has been a trend toward shorter term financing. The ratio of short-term to total debt for nonfinancial U.S. corporations rose from a stable range of about 30 percent between 1955 and 1964 to just under 50 percent by the end of 1982.[8] According to our analysis, this means that deflationary disturbances will lead to sharper initial declines in spending and output than in the past. We also expect to see quicker recoveries because the debt structure can adjust more quickly to lower price levels and to lower nominal cash flows.

The conclusion that an economy with shorter term debt can recover more quickly must be qualified, however, because it rests on the implicit assumption that endogenous adjustment processes in the system are stable regardless of the maturity of outstanding debt. This may not be the case. If the initial deflationary disturbance is large enough, and if the debt structure is short-term, a severe liquidity squeeze has a greater potential for causing a financial collapse entailing widespread bankruptcies, bank failures, and general financial disintermediation. The system may not be able to recover endogenously. Under these circumstances, government intervention may be necessary to prevent the deflationary shock from exploding into a financial crisis.

The recent debt problems in the agricultural and oil producing sectors provide examples of this kind of phenomenon. Changes in world markets caused cash flow problems in these industries that severely impaired the ability of farmers and oil producers to service their debt. This spread through the banking system until Continental Illinois bank teetered on the brink of collapse. As a result of a masssive FDIC and Federal Reserve bail-out, the systemic effects of Continental's failure were contained. But if market forces had been allowed to operate freely, a crisis in the world financial system would have been a serious possibility.[9]

In our analysis so far, we have ignored interest rate movements by implicitly assuming that outstanding debt carries fixed interest obligations. In this case, nominal cash flows necessary to service existing debt are not affected by changing interest rates. However, this is not realistic for debt contracts that carry variable interest rates. It is also unrealistic for long-term projects financed with short-term debt that must be rolled over. What are the implications of variable rate financing for macroeconomic performance?

Standard textbook macro theory recognizes that a deflationary shock such as a monetary contraction will raise interest rates and choke off expenditure by increasing the price of *new* financing. When existing contracts carry variable rates, a decline in the money or credit supply will also reduce expenditure through our cash flow effect as rising interest rates increase *existing* payment commitments and reduce margins of safety. Thus, in an economy with nominal payment commitments, variable rate financing will make the initial drop in output more severe after a shock that raises interest rates. This means that the trend over the last decade toward variable rate financing increases the short-run sensitivity of real output to changing financial conditions, and makes the macro system less stable.

The worst case of system instability involves long-term projects financed with short-term debt. Because these projects have long gestation periods before they generate cash flow, their financing has the same systematic implications as long-term liabilities. Any unanticipated price level changes will affect the cash flow available for servicing the debt more quickly than the cash commitments based on old price expectations can adjust. The effect on margins of safety and expenditure will persist for the economic maturity of the project even though the liabilities used to finance it are short-term.

Because these obligations must be rolled over, however, they also entail the volatility of short-term debt. Their interest rates will change as new liabilities are contracted at going market rates. Moreover, if the

debtors become liquidity constrained, they will not have the same flexibility to adjust to new circumstances that they would have with long-term financing. They must pay off the principal of their old loans quickly, and they must qualify for new credit at what may be a very unfavorable time. These circumstances increase the importance of the cash flow effect in the aggregate and make the system more fragile.

In the relatively turbulent financing environment of the last decade, short-term financing of long-term projects has become much more common. Lenders are unwilling to make long-term commitments without receiving large risk premiums. Borrowers have responded by financing with short-term liabilities, and the robustness of the financial system has suffered. A good example of this is the market for home mortgages. Variable rate financing and "balloon" payments became more common as traditional lenders, who had suffered large losses from old fixed-rate obligations, charged high risk premiums for the old style mortgages. The result, however, has been delinquency and default rates at historic highs even well into a robust cyclical recovery. Again, financial evolution is proceeding in a direction that threatens the stability of the system.

Conclusion

This article has identified some links between the structure of credit relations and the performance of the aggregate economy. Undoubtedly, many more examples can be found. The general neglect of these linkages in mainstream macroeconomic theory may be the result of the relatively tranquil state of financial markets during the early post-war period when the basic tenets of the neoclassical synthesis emerged. But as is common in economics, changing events have preceded theory. The rapid and continuing evolution of credit relations has important implications for our macro system's performance. Theory that ignores this aspect of the monetary economy can lead to flawed predictions and poor policy analysis.

In fact, monetary policy analysis is one area significantly affected by the issues raised here. The typical IS-LM or monetarist reduced-form models treat increases and decreases in the money stock symmetrically, and neither approach focuses much attention on the particular state of credit markets at the time a policy change occurs. However, our analysis identifies an important asymmetry in the effects of monetary policies. Contractions can lead to serious cash flow difficulties, and can increase the threat of insolvency and bankruptcy. These factors increase the output loss following a contraction, and can lead to widespread financial crises. These effects are not relevant for monetary expansions. Thus, the monetary authority is much more constrained with its restrictive policies than with its expansionary moves.

Furthermore, the economic effects of a particular policy at any given time will depend on the prevailing structure of credit relations in the economy. What may be an effective policy in some circumstances can lead to disastrous results in others. The legacy of high inflation and volatile financial markets in the seventies and the deep contraction of the early eighties, is an especially fragile financial structure by post-war standards. Widespread use of short-term and variable rate financing makes the system much more sensitive to monetary contractions, and makes the need for liberal lender-of-last-resort policies more acute.

Another implication of our analysis concerns the trend toward deregulating financial markets. Many of the constraints put on the financial system in the aftermath of the Great Depression undoubtedly have their costs in microeconomic efficiency. But with the financial system still in rather precarious circumstances it would seem best that deregulation proceed with the utmost caution. Furthermore, careful analysis of the effects and the desirability of greater reliance on free financial markets must be based on more than micro efficiency criteria under the implicit assumption that price flexibility will ultimately take care of any macro problems. The macroeconomic impacts of changing financial structures must also be considered, lest we forget the circumstances that led to our current system of financial regulation.

In conclusion, let us emphasize our major point. The particular structure of intertemporal debt commitments affects macroeconomic performance. Theoretical and empirical work, as well as policy analysis, must take these often neglected institutional factors into account.

Notes

1. This issue is developed in detail in John Caskey and Steve Fazzari "Monetary Contractions, Wage Flexibility, and Nominal Debt Commitments," mimeo, August, 1985.
2. A contemporary exception to this can be found in James Tobin, "Keynesian Models of Recession and Depression," *American Economic Review,* 65 (May 1975): 195–202, where he argues that a change in the distribution of real wealth between debtors and creditors may affect aggregate demand due to a difference between debtors' and creditors' marginal propensities to consume. An early warning of the dangers of a debt deflation is found in Irving Fisher, "The Debt Deflation Theory of Great Depressions," *Econometrica* 1 (October 1933): 337–57.
3. For example, in "Permanent Income, Liquidity, and Expenditure on Automobiles: Evidence from Panel Data," *Quarterly Journal of Economics* 99 (1984): 587–614, Ben Bernanke found that cash flow was the most important variable explaining consumer durable expenditure. Robert Coen, "The Effect of Cash Flow on the Speed of Adjustment," in *Tax Incentives and Capital Spending,* ed., Gary Fromm, Washington, D.C.: Brookings, 1971; Allen Sinai and Otto Eckstein, "Tax Policy and Business Fixed Investment Revisited," *Journal of Economic Behavior and Organization* 4 (1983): 131–62; and Steven Fazzari and Tracy Mott, "The Investment Theories of Kalecki and Keynes: An Empirical Study of Firm Data 1970–82," mimeo, (September 1985) find that corporate cash flow is an important determinant of investment expenditure.

4. Bala Batavia and Nicholas A. Lash, "The Impact of Bank Portfolio Composition on GNP," *Journal of Money, Credit, and Banking* 14 (November, 1982): 517–24, among others, empirically verify the shift of bank asset portfolios into government obligations during recessions.
5. For an analysis of the microeconomic basis behind this result, see Joseph Stiglitz and Andrew Weiss, "Credit Rationing in Markets with Imperfect Information," *American Economic Review* 71 (June 1981): 393–410. Ben Bernanke, "Nonmonetary Effects of the Financial Crisis in the propogation of the Great Depression," *American Economic Review* 73 (June 1983) 257–76 provides some empirical support for this theory.
6. This conclusion conflicts with the neoclassical synthesis of macroeconomic theory that holds downward inflexibility of nominal variables responsible for the real effects of aggregate demand shifts. However, our view has important precedents in the literature. See, for example, chapter 19 of John Maynard Keynes's *General Theory,* New York: Harcourt, Brace, and World, 1936, and Hyman Minsky, *John Maynard Keynes,* New York: Columbia University Press, 1975, especially page 137. This analysis is carried out in detail in John Caskey and Steve Fazzari, "Monetary Contractions."
7. See "Putting the Homestead Into Hock," *New York Times,* 24 November 1985, page 1.
8. See Allen Sinai, "Business Liquidity, Reliquification, and the Prospects for Capital Spending," testimony presented before the House Subcommittee on Domestic Monetary Policy, 17 May, 1983.
9. See Phillip Zweig, *Belly Up: The Indecent Exposure of American Banking,* New York: Crown Publishers Inc., 1985.