American Debates on the Sources of Business Cycle Fluctuations

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ABSTRACT

This paper differs from other recent critiques of "modern macro" based on DSGE models. It goes beyond criticizing these models for their assumptions of complete and efficient markets by proposing an alternative macroeconomic paradigm that is more suitable for tracing the links between the financial and real commodity markets. The paper rejects the adjective "Keynesian" to describe the economy's demand side of disequilibrium in which markets fail to clear in the presence of demand shocks with price rigidity. It accepts that Lucas and Sargent in 1978 successfully discredited the adjective "Keynesian" through a rhetorical *tour de force* which forever linked the demand side of non-market-clearing macro with the logically unrelated first-generation Phillips curve with its permanent negative inflation-unemployment tradeoff.

The paper resurrects "1978-era" macroeconomics that combines the same non-market-clearing aggregate demand side based on price rigidity with a supply-side invented in the mid-1970s that recognizes the co-existence of flexible auction-market prices for commodities like oil and sticky prices for the remaining non-oil economy. As combined in 1978-era theories, empirical work, and pioneering intermediate macro textbooks, this merger of demand and supply resulted in a well-articulated dynamic aggregate demand-supply model that has stood the test of time in explaining both the multiplicity of links between financial market meltdowns as in 1929-32 and 2007-09, as well as why inflation and unemployment can be both negatively and positively correlated. Mankiw's (2006) lament that his policy-making and macro-teaching "engineers" have rejected modern post-1978 macro fails to suggest constructively an alternative paradigm, but that lack is precisely what is remedied in this paper with its full fleshing out of 1978-era macro.

Along the way, the paper goes beyond most recent accounts of the worldwide economic crisis by pointing out numerous similarities between the leverage cycles of 1927-29 and 2003-06, particularly parallel regulatory failings in both episodes, and it links tightly the empirical lack of realism in the demand and supply sides of modern DSGE models with the empirical reality that already was built into the 1978-era paradigm resurrected here.

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1. Introduction

For more than three decades since 1978 hundreds of U. S. macroeconomists have developed what is often called "modern macro."[1] Until recently, there was evident and almost universal self-satisfaction not only that macroeconomic truth had been discovered and old errors had been buried, but also that the U. S. "Great Moderation" of macroeconomic volatility in the 1984-2007 period had been a side benefit of modern analysis. However since 2007 the world economy has entered a crisis of sub-prime mortgage defaults, overleveraging followed by deleveraging, output and employment meltdowns, and an enormous destruction of wealth. The Great Moderation is dead. Neither the proponents of modern macro nor the adherents of Keynesian ideas anticipated the crisis in advance. But even the most avid members of the modern macro camp have thus far failed to provide any intellectual links with their preferred explanations of business cycle downturns based on technology retardation, changes in preferences, or tightness in monetary policy. In contrast the Keynesian adherents interpret the current downturn as one more example of the variety of aggregate demand shocks that can combine and interact to create a massive downdraft on economic activity in a disequilibrium where markets fail to clear, just as occurred from 1929 to 1933 and many other episodes since then.

This paper is not an endorsement of 1936-era Keynesian thought, but rather establishes an alternative intellectual paradigm called "1978-era macroeconomics." This incorporates all the rich underpinnings of Keynesian economics added in the postwar era by Baumol, Eisner, Friedman, Jorgenson, Modigliani, and Tobin and many others to the micro foundations of the economy's demand side. But it does not include the other intellectual baggage of the term "Keynesian economics", which has been forever tainted by association with the discredited 1960s-era Phillips Curve and its implication of an exploitable inflation-unemployment tradeoff. Instead, in this paper the paradigm of 1978-era macro combines the sophisticated mid-postwar analysis of aggregate demand combined with the 1975-78 development of the dynamic aggregate supply-demand model that incorporates policy responses to supply shocks and predicts that the correlation between inflation and unemployment can be both negative and positive. To understand the domestic macroeconomic environment of the 2007-09 worldwide crisis, we are best served by applying 1978-era macro and forgetting most of the modern macro that has been developed since.

The world economic crisis started in the United States, and an understanding of its causes, possible prevention, and policy responses is most easily developed in the

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1. "Modern macro" describes the set of models and strategies that have dominated graduate school and academic-conference macroeconomics since the late 1970s. Developers of modern macro rarely use that phrase since they take for granted that all macro is "modern," while critics like Solow (2008) feel obliged to define "modern macro" as what they are criticizing.

context of a hypothetically closed American economy. The economics literature of the last 50 years is dominated by American economists arguing over alternative theories of the domestic sources of American business cycles. Any suggestion in this paper that American macroeconomics has been going backwards in the past few decades does not extend to our colleagues who have greatly deepened our understanding of international imbalances and exchange rate adjustment. This paper is only about the closed-economy macroeconomic theory of business cycles in the United States and is not concerned with modern international monetary economics nor long-run growth theory.

The failings of modern American domestic macro were evident long before the start of the world crisis in 2007. Yet so dominant have been the modern macroeconomists in the teaching of graduate economics education that few economists under the age of 45 are even aware that there is another macro that was well developed by 1978 and provides a more suitable intellectual framework for dealing with the current crisis. Even a distinguished senior economist, Olivier J. Blanchard (2008), recently joined in the orgy of self-congratulation by writing a survey paper on the state of macro which concluded "the state of macroeconomics is good." His sanguine paper was released as a NBER Working Paper only one month before the failure of Lehman Brothers in September, 2008, began the worldwide downward economic spiral.

The development of this paper by coincidence coincides with the recent cover of *The Economist* (July 18, 2009), which depicts a wax-like book titled *Modern Economic Theory,* shown melting into oblivion like the Wicked Witch of the West in the 1939 movie *The Wizard of Oz.* The *Economist* derides the economics profession for (1) helping to cause the crisis, (2) failing to spot it, and (3) having no idea how to fix it. Our theme is different; there is no accusation here that economists of one school of thought or another "caused the crisis." Some did see it coming but almost none forecast the amplification of shocks that is its unique trait.

The malaise of modern macroeconomics has recently been the subject of strikingly vitriolic accusations. *The Economist* (p. 70) quotes Paul Krugman's LSE Lionel Robbins Lecture of 10 June 2009 as stating "most macroeconomics of the past 30 years was spectacularly useless at best, and positively harmful at worst." In notably similar language that might have inspired Krugman, Buiter (2009) wrote three months earlier that "the typical graduate macroeconomics. . . training received at Anglo-American universities during the past 30 years or so may have set back by decades serious investigations of aggregate economic behaviour and economic policy-relevant understanding. It was a privately and socially costly waste of time and other resources." I have not been immune from such accusations and wrote long before the crisis (2002) that since 1978 macroeconomics had consisted largely of "digging out of dead ends."

This paper takes a more temperate view of what is wrong with modern macro. It looks back into the pre-crisis (pre-2007) intellectual history of macroeconomic theory

and argues that modern macro neglects the basic sources of both impulses and propagation mechanisms of business cycles. The basic problem is that modern macro consists of too much micro and not enough macro. Focus on individual preferences and production functions misses the essence of macro fluctuations – the coordination failures and macro externalities that convert interactions among individual choices into constraints that prevent workers from optimizing hours of work and firms from optimizing sales, production, and utilization. Modern macro has too narrow a view of the range of aggregate demand shocks that in the presence of sticky prices constrain the choices of workers and firms. Shocks that have little or nothing to do with technology, preferences, or monetary policy can interact and impose constraints on individual choices.

Lost in the marriage of individual maximization and price stickiness was the fundamental insight of Keynesian economics that the combination of nominal demand shocks with price stickiness causes a direct translation of nominal shocks to real shocks. Far from choosing the utility-maximizing amount of output, consumers are constrained by the rationed level of output, which becomes a residual (i.e., nominal GDP divided by a predetermined price level) rather than a choice variable. In modern macro based on individual maximization among representative agents, the illusion is fostered that a consumer unit or household can choose any combination of work and market consumption it desires, whereas in fact in business downturns many consumers cannot find the work hours they desire at the current real wage, and they cannot consume what they would wish at current prices because of the lack of income due to rationed job opportunities as well as uncertainty about the possibility of future job loss. In short, modern macro clings to the tradition of market clearing (MC), whereas the essence of 1978-era macro is price stickiness with non-market-clearing (NMC).

How does the contrast between domestic American "modern macro" and the alternative 1978 version illuminate the current world crisis? Modern macroeconomics has nothing to say about the origins of the Great Depression of the 1930s and concludes that it must have resulted from a massive negative technology shock, a monumental bout of forgetfulness. In contrast 1978-era macro understands the Great Depression as the joint result of wealth, consumption, investment, and monetary policy shocks in the context of regulatory failure. No 1978-era macroeconomists predicted in advance the full sweep of the 2007-09 meltdown, but they were led by their studies of the Great Depression and postwar business cycles to regard as fundamental drivers of business cycles a wide variety of demand shocks, including the coordination failures evident in financial and housing bubbles.

The paper begins in Part 2 with an account of the worldwide crisis, where the main novelty is a set of observations about similarities and differences between 2003-09 and 1927-32. Then in Part 3 the elements of 1978-era macroeconomics are established and are contrasted in Part 4 with the hybrid but inconsistent edifice built by modern

macroeconomists in the form of Dynamic Stochastic General Equilbrium (DSGE) models.

2. Origins of the World Crisis and Analogies with 1927-32

By now the key aspects of the 2007-09 worldwide crisis are well understood to have originated in the U. S. and then spread worldwide. This section distinguishes between impulses and propagation mechanisms, focusing on why the apparently minor perturbation in the U. S. subprime mortgage market could have multiplied its impact into a significant downdraft on world real GDP and a collapse in worldwide stock market valuations. The main novelty in this account is to add a few comparisons with the 1927-29 stock market bubble and subsequent collapse. Which are the main similarities and differences between the two episodes, beyond the well-understood differences in monetary policy response?

2.1 Impulses That Initiated the Crisis

The initial problem that led from the sub-prime mortgages to the contamination of the entire U. S. financial system is concisely expressed by Blinder (2007), who wrote well in advance of the ultimate 2008 meltdown about the "Six Fingers of Blame." Blinder's account, however, omits the supporting role of misguided public policy, so the appropriate number of fingers of blame is closer to twelve than six. Blinder's first finger points to the core initial problem, gullible consumers who signed up for mortgages that they did not understand and could not afford. Many of these mortgages were based on low variable interest rates that would subsequently reset to higher rates, implying monthly payments that, if not already well above the borrowers' ability to pay, would soon rise above that level. Borrowers were lured into these low-ball propositions in addition by negligible down payment requirements, not mentioned by Blinder but a glaring regulatory failure to which we return below.

The second finger of blame is pointed at mortgage brokers who were lured by lucrative fees from the financial institutions that initially funded the mortgages. Greed induced the brokers to push products that deceived the overly optimistic and gullible borrowers. The third finger points at the U. S. regulatory system, which regulates only banks and not other nonbanks which funded roughly half of the subprime mortgages. The fourth finger notes the process of securitization, which has some desirable features of spreading risk. The banks and nonbanks which funded the mortgages promptly sold them into pools of thousands of mortgages that were then issued as mortgage-backed securities to investors around the world. Securitization, like novicain for a tooth, deadens recognition of risk on both ends. The banks and nonbanks originating the mortgages sell them and thus have little incentive to monitor the suitability of the subprime mortgages for low-income borrowers. And the worldwide institutions buying

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the securities had little knowledge of the underlying risks, which in any case were understated because of the unrealistic assumption that housing prices could only go up, never down. The investment bankers who dreamed up the new security products are targeted in Blinder's fifth finger of blame. And the sixth finger points at the securities rating agencies who by now are regarded skeptically due to their system of payment by those whose securities they rate, much as if students graded their own final exams.

2.2 Regulatory Failure

However, this account places much too little emphasis on the role of regulatory failure, which began back in 1999 with the Clinton Administration's decision to repeal 1930s-era banking legislation known as the Glass-Steagall Act that had erected a wall between commercial and investment banking. In a far-sighted prediction of what would occur after 1999, the Congressional Research Service in 1987 cited four arguments against repeal. The first was the inherent conflict of interest between the granting of credit by commercial banks and the use of credit by the same firm to create securities; the Act itself was designed to curb the abuses of the 1920s which helped to cause the Great Depression and came back to haunt the financial markets in 2007-09. The second reason was the need to limit the power of depository institutions, and the third was that securities activities can be risky, potentially leading to large losses that could undermine the solvency of commercial banks. Finally, in another prophetic argument, banks were "not conditioned to operate prudently in the more speculative securities businesses," with the late 1980s crash of the Real Estate Investment Trusts given as an example.[2] The Repeal of Glass-Steagall would not have been so significant if at the same time a regulatory structure had been established for the securities industry parallel to that which the Federal Reserve had long administered for the commercial banks.

Perhaps the most glaring failure, thus far little discussed in the commentary on the financial meltdown, was the absence of Federal regulation requiring stringent down-payment requirements. This is particularly ironic because the Fed's Regulations T, U, and X have long regulated margin requirements for stock market credit. Low 10 percent margin requirements were a culprit in the 1929 stock market bubble and crash, and the absence of tight regulations on residential mortgage down payments played a parallel role in the 2003-06 housing bubble and crash. The absence of U. S. regulation on downpayments shows a striking failure at "Regulation 101" and baffles observers from other countries that maintain stiff down payment requirements of 20 or 30 percent.[3]

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2. The report of the Congressional Research Service cannot be directly accessed but is summarized in the Wikipedia entry on the Glass-Steagall Act. Further insight into the politics behind the repeal and its subsequent responsibility for the 2007-09 crisis can be found in Engdahl (2008).
3. The absence of a subprime crisis in nearby Canada is due partly to tighter regulations on the mortgage market. At a recent conference that I attended, Chinese economists reported that their country imposes 30 percent down payment requirements on mortgages. If 30 percent

The indictment of policymakers goes beyond regulatory failure. It is widely acknowledged that the Fed maintained short-term interest rates too low for too long in 2003-04, in the sense that any set of parameters on a Taylor Rule-type function responding to inflation and the output gap would predict substantially higher short-term interest rates during this period than actually occurred. These low interest rates made it particularly profitable for banks and nonbanks to make mortgage loans and to pay large fees to the mortgage brokers who originated them, and thus indirectly the Fed's interest rate policies contributed to the housing bubble. A complementary explanation explains low rates on long-term U. S. government debt as the result of a worldwide "saving glut" that produced a flood of saving from China and elsewhere, holding down the long-term rate that serves as a basis for setting mortgage interest rates. Note that the surprisingly low long-term rates that Alan Greenspan called a "conundrum" would not have caused a housing bubble and subprime mortgage crisis if regulators had maintained tight minimum down payment provisions analogous to their control of stock market margin requirements.[4]

2.3 Amplification Mechanisms

All of these factors contributed to the initial impulse toward financial market distress initiated by the subprime mortgage fiasco. But what amplification mechanisms (or multipliers) converted losses on subprime mortgages of perhaps $250 billion into a 2007-09 loss of world GDP of twenty times as much and a loss on the world's stock markets between 2007 and late 2008 of roughly 100 times as much (Blanchard, 2009, p. 3)? Our initial fingers of blame focused on securitization of mortgages, fostered by the 1999 repeal of the Glass-Steagall act. Securitization in turn fostered an increase in leverage, made possible by gaping holes in the regulatory patchwork quilt that allowed large financial institutions to move substantial blocks of assets off their regulated balance sheets. Increased leverage by reducing capital as a share of total assets guaranteed that any future loss in the value of assets would push some institutions (not just banks but also investment houses and insurance firms) toward insolvency.[5]

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requirements had been regular practice in the U. S., the subprime mortgages never would have existed because low-income borrowers would not have had the financial resources for such a large down payment. It is reasonable to conjecture that in this hypothetical case the worldwide financial meltdown would not have occurred. There seems to be a widespread consensus that tightening by the Fed in response to the late 1920s stock market bubble "contributed significantly to the onset of the slump" (Eichengreen, 1992b, p. 221).

4. Further, the Fed was not powerless to combat the effect of foreign savings on the long-term interest rate, since it always had the power to push short-term interest rates higher and eliminate the incentive to create new mortgages.

5. Geanakoplos (2010, forthcoming) develops an endogenous model of leverage. In his words, "Variations in leverage cause wild fluctuations in asset prices. This leverage cycle can be damaging to the economy and should be regulated."

Blanchard (2009, pp. 6-7) identifies several further causes of amplification. First, just as there were bank runs in 1930-32 prior to the introduction of deposit insurance, so the fear of insolvency in this era of deposit insurance led those providers of uninsured short-term "wholesale funding" to monitor closely the possibility of bank insolvency and to restrict lending to suspect institutions. Further compounding the implosion was the difficulty of placing market valuations on securities of unknown riskiness, thus increasing uncertainty, the fear of insolvency, and the likelihood of bank runs. Runs and uncertain valuations are complementary and interacting sources of amplification. Finally, amplification from the U. S. across national borders was fostered by increased foreign claims held by banks in Europe and Japan (Blanchard, 2009, Figure 3), and the crisis then spread to emerging markets as banks reined in credit to all borrowers deemed potentially risky.

2.4 Similarities and Differences with the Late 1920s

What were the similarities and differences between the financial bubble of the late 1920s and that of 2003-07? The parallel between low stock market margin requirements in the 1920s bubble and low down payment requirements in the housing bubble of this decade can be supplemented by other similarities, as well as a few differences between the 1920s and this decade. An important similarity is the parallel between the securitization and leveraging of the past decade and the financial market fragility of the late 1920s. "The major part [of new equity issues], particularly from 1926 on, seems to have gone into erecting a financial superstructure of holding companies, investment trusts, and other forms of intercorporate security holdings that was to come crashing down in the 1930s" (R. A. Gordon, 1974, p. 35).[6] Also similar in the 1920s and in the current decade were large profits by investment bankers and a stimulus to consumer demand taking the form of capital gains on equities in the late 1920s and the form of mortgage equity withdrawal during the housing price bubble of 2003-07.

A further similarity was the role of international contagion in spreading the effects of the American stock market bubble and bust to foreign countries, especially in Europe. In the classic analysis of Eichengreen (1992a) the role of U. S. foreign lending in recycling European balance of payments deficits was cut off by the attraction to capital of American stock market investments together with U. S. monetary tightening that spread abroad as the gold standard forced countries to tighten their own monetary policies as they responded to a loss of gold to the U. S. and also for different reasons to France. As we have seen, increased cross-border holdings of securities by large banks in Europe and Japan caused a similar contagion effect in 2007-09.

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6. A more detailed analysis of financial fragility in the 1920s is provided by White (2000, pp. 752-7).

There were important differences between the institutions and regulations of the late 1920s and of this decade. A glaring difference was that prior to 1933 there was no deposit insurance, leaving a trail of disaster as bank failures beginning in 1930 caused lifetime savings of many American households to evaporate, thus exacerbating the Great Contraction of 1929-33. In addition to flawed regulation that fostered financial pyramids, overleveraging, and insufficient stock market margin requirements, there was too much regulation that in many states prevented banks from establishing branches; in 1924 only eleven states allowed statewide banking. This branch-banking prohibition created thousands of unit banks, highly vulnerable to the vicissitudes of local economic conditions including agricultural distress.

The most obvious difference between the two decades was in the response of monetary policy to financial collapse, with the Fed's indifferent neglect in 1930-32 contrasting with its aggressive post-2007 reductions in short-term interest rates together with a large amount of quantitative easing. Another difference is that in 1928-29 the Fed tightened policy substantially, and in the words of Eichengreen (1992b, p. 221), "increasingly stringent U. S. monetary policy contributed significantly to the onset of the slump." In contrast, the Fed in 2003-06 maintained that it would not raise rates enough to cut short the housing boom, although the Federal Funds rate was raised in steps from 1.0 percent in June, 2004, to 5.25 percent in June, 2006.

Viewed more broadly, a more basic similarity between the 1920s and the period between 1995 and 2006 was the view that permanent prosperity had arrived, and that the good times should be allowed to roll. The underpinning of this benign environment was the parallel upsurge in productivity associated with the invention of new "general purpose technologies" (GPTs, Bresnahan and Trajtenberg, 1995). In the 1920s productivity was boosted by the delayed payoff of the invention in the late 19th century of two revolutionary GPTs, electricity and the internal combustion engine. Many of the reasons for the delay in the application of electricity to manufacturing in the analysis of David (1990) apply as well to the internal combustion engine which required technical development and highway construction fully to transform transportation and distribution. Likewise, in the late 1990s the invention of the internet together with other delayed applications of the computer, including bar-code scanning, boosted productivity growth for several years after the collapse of the late 1990s investment boom itself. More rapid productivity growth held down inflation and in this decade allowed the Fed to justify its maintenance of low interest rates.

The sanguine feeling in the 1920s that permanent prosperity had arrived was echoed in the early years of this decade with many analyses of the macroeconomic "Great Moderation", featuring a lively debate between those who viewed the moderation as the result of good luck in the form of favorable shocks (including the productivity growth revival) and those who interpreted it as the result of increasing sophistication in macroeconomic analysis and its application in the form of enlightened

Federal Reserve policy (Stock-Watson, 2003). Indirectly the result of this general contentment with the macroeconomic environment was to blind policymakers and risk-takers of the possibility of bad outcomes. Just as the stock market mania of the late 1920s led gullible investors to ignore unsustainable price-earnings ratios, so the housing bubble of 2003-07 led both homeowners and the financial community to disregard the growing and unsustainable ratio of housing prices to income. In this sense macroeconomic success led to macroeconomic failure.[7]

3. The Fundamentals of 1978-Era Macro: Combining Multiple Sources of Demand Shocks with Policy Responses to Supply Shocks

The common elements in the world financial crises that began in 1928-29 and 2007-08 suggest a common set of spillover effects from the financial distress to the real economy. Much of Keynesian economics and what I call here "1978-era macroeconomics" was designed to explain the set of impulses and propagation mechanisms that created and amplified the Great Depression. The same intellectual framework is equally suitable to interpret how the current world economic crisis was transmitted from the financial sector to the real economy.

My interpretation of 1978 macro goes far beyond 1936 Keynesian economics. It is laid out in substantial detail in two pathbreaking intermediate macroeconomic textbooks that were published in early 1978, those by Rudi Dornbusch and Stan Fischer, and the competing volume that I published in the same year. The most important post-Keynesian contribution of those two textbooks was to move macroeconomics beyond the previous tie of Keynesianism to a negatively sloped Phillips curve, replacing that with a fully articulated dynamic supply and demand model of aggregate price behavior. Inflation and output were no longer positively correlated but could have any correlation depending on the relative importance of aggregate supply and demand shocks, just as the price and output of wheat can be positively or negatively correlated. One aspect of 1978-era macro that did not make it into these textbooks involved the cyclical dynamics of output, hours, and productivity. Dynamic versions of Okun's (1962) law showed that most of the short-term fluctuations in productivity resulted from systematic patterns in the lag of hours adjustment to cyclical output changes.[8] The short-run technology movements or "technology shocks" that are the basis of much of modern macro are a reflection of specification and measurement error, not reality.

7. This idea of success leading to failure has been suggested before. "William White and his colleagues at the BIS were among the first – following the scholarship of Hyman Minsky – to analyze how the `Great Moderation' may paradoxically lead to `Financial Instability,' asset and credit bubbles and financial crises" (Roubini, 2009). A similar idea is suggested by Blanchard (2009, p. 4).

8. We discuss below the "four frequencies" of hours and productivity responses to output fluctuations, originally developed in this form by Gordon (1979).

3.1 The Demand Side of 1978-Era Macro

The original Keynesian revolution of the 1930s combined wage and price rigidity with volatile investment spending and a lack of coordination between the saving and consumption decisions of households and the investment decisions of firms. It was designed to explain a macroeconomic disequilbrium, a failure of markets to clear. It was the first in a series of contribution to non-market-clearing (NMC) macroeconomics that is particularly suitable for analyzing major macroeconomic dislocations, such as the Great Depression, the major postwar recessions, and the 2007-09 worldwide economic crisis. From the perspective of the 1930s, policy conclusions included the primacy of fiscal policy and the weakness of monetary policy.

Macroeconomics was all about aggregate demand and the role of price stickiness in converting shifts of nominal demand into real output disturbances. As codified in the Hicksian IS-LM model of 1937, shifts in both commodity and money demand contributed to instability in aggregate demand, and there was no presumption that changes in the real money supply or in real government spending were particularly strong or weak sources of stabilization except in extreme well-defined cases. Today more than 70 years later, the IS-LM model still appears as the centerpiece of aggregate demand analysis in most American intermediate macro textbooks. Those textbooks emphasize that instability of aggregate demand, e.g., a shift in the IS curve, can originate in any of the components of spending, especially consumer durables, private investment, inventory change, government spending, tax rates, fluctuations in the exchange rate, and changes in the world demand for home country exports.

The central coordination failure of the original Keynesian model, that between saving and investment, was developed into formal models of the business cycle starting with Samuelson's (1939) multiplier-accelerator model. The accelerator theory embodied the basic insight that the desired stock of capital depended on the level of output, and hence net investment (the rate of change of the capital stock) depended on the rate of change of output. Samuelson derived a difference-equation model that generated either explosive or damped oscillations, depending on parameter values, with steady oscillations possible only at particular knife-edge parameter values. This led subsequently to a contest between models in which damped oscillations generated new cycles as the result of demand shocks, and alternative models (e.g., Hicks, 1950) in which explosive oscillations were contained by the ceiling of available capacity and the floor determined by the minimum level of investment needed to replace depreciating capital.

During the quarter century prior to 1978, this basic structure was enriched first by the Friedman and Modigliani theories of the consumption function, which shifted attention from current to permanent income as the main driver of consumption and opened a channel for changes in financial and housing market wealth to alter

consumption. Jorgenson's neoclassical theory rationalized the role of interest rates and tax incentives as joint determinants of investment along with changes in output which had been the centerpiece of the accelerator theory of investment. Baumol and Tobin clarified the sources of the interest sensitivity of the demand for money, while Friedman and Tobin viewed money as substitutable with other assets, leading to the possibility of unstable demand for narrow money as a consequence of changes in financial regulation that shifted the attactiveness of particular types of assets.

Friedman and Schwartz in their 1963 interpretation of the Great Depression revived the importance of monetary policy and particularly in the dangers of failing to control the quantity of money, while Friedman and several co-authors attempted to shift the mantle of weakness from monetary policy as in Keynes to fiscal policy. Eisner (1969, 1971) argued that temporary fiscal policy stimulus or restraint was rendered ineffective by Friedman's permanent income hypothesis, adding to the primacy of monetary policy and obsolescence of short-term countercyclical policy in American discussions from the late 1960s until the current 2007-09 crisis. Eisner and others argued that fiscal policy, far from being a source of stabilization as perceived by Keynes, actually was a primary source of instability of aggregate demand as a side-effect of wars such as those in Korea and Vietnam.

Modern views of 1978 macroeconomics are clouded by the negative connotations of the word "Keynesian". A more neutral description would be a class of models in which markets fail to clear, i.e., non-market clearing (NMC) macro. The implications of price stickiness were developed for consumption behavior by Clower (1965) and for the labor market by Patinkin (1956). These contributions were then merged and codified into a general equilibrium model combining the commodity and labor markets by Barro and Grossman (1976), with additional contributions by Benassy (1976) and Leijonhufvud (1968). In the Barro-Grossman version, as in the IS-LM model, the price level is not just sticky but absolutely fixed. Any change in nominal demand in the face of price fixity automatically translates into a change in output and hence in the constraints faced by households attempting to work the number of hours they wish and faced by firms attempting to sell the profit-maximizing amount of production.

Patinkin introduced the distinction between Marshallian "notional" demand curves and constrained "effective" demand curves for labor.[9] In a recession workers cannot find jobs or achieve the desired division between work and leisure that they desire at the going levels of wages and prices. The essential truth of this paradigm is evident in almost every country in the world in 2008-09 when we ask, does each member of the labor force have the free choice of working the desired number of hours at the going wage and price? Does each firm, whether a large or small business, find it

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9. Formally effective labor demand for Patinkin is the minimum of either the profit-maximizing quantity of labor at the going real wage or the amount of labor demand implied by the inverse of the production function when output is constrained rather than a choice variable.

possible to sell the optimal level of production at the current wage and price? The answer of course is a resounding "no," and this is the primary reason why NMC models are central to understanding of the current worldwide crisis and previous economic downturns dating back to the Great Depression.

Thus by 1978 the postwar Keynesian model had developed into a sophisticated analysis of reasons for stability and instability in the components of aggregate demand. What was missing was a parallel treatment of the supply side. The large macroeconometric models developed in the 1960s at MIT, Penn, Brookings, and the Federal Reserve Board supplemented a multi-equation treatment of the demand side with a naïve reliance on a stable Phillips curve tradeoff. The demise of that tradeoff in the 1970s led not just to the rejection of the Phillips Curve but, in a classic example of baby thrown out with the bathwater, to the rejection of Keynesian economics itself.

3.2 The Demand Side Divorces the First-Generation Phillips Curve and Remarries the Sophisticated 1978 Dynamic Aggregate Supply-Demand Model

It is still a widespread view among modern macroeconomists that Keynesian economics is of no further interest, as it was buried by the empirical failure of the original Phillips Curve. When plotted in Figure 1 on a scatter diagram from 1960 to 1980 the inflation and unemployment rates are indeed uncorrelated, with a combination of negative and positive correlations that range all over the map. The negative PC tradeoff appeared to be utterly defunct, leading Arthur Okun in 1980 to describe the Phillips Curve as a UFO, or "unidentified flying object."[10] Leaping triumphantly on this failure, and eager to demolish not just the short-run tradeoff but also Keynesian economics as a whole, Lucas and Sargent (1978, pp. 49-50) described "the task which faces contemporary students of the business cycle [is] that of sorting through the wreckage . . . of that remarkable intellectual event called the Keynesian Revolution."

Several years *before* the famous "wreckage" pronouncement by Lucas and Sargent, the resurrection of the PC began. The first and perhaps most important element was the new theory of policy responses to supply shocks, developed independently by Gordon (1975) and Phelps (1978) in two slightly different models that were later merged by Gordon (1984). The "Gordon-Phelps" model starts from the proposition that the price elasticity of demand of the commodity experiencing the adverse supply shock, e.g. oil, is less than unity, so that following an increase in the relative price of oil, the expenditure share of that commodity must increase and the expenditure share of all other components of spending must decrease. For instance, energy's share of nominal US GDP tripled between 1972 and 1981.

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10. The full quote from Okun (1980, p. 166) is "Since 1970, the Phillips curve has been an unidentified flying object and has eluded all econometric efforts to nail it down."

An underlying assumption of the Gordon-Phelps model is that the price level is neither entirely fixed nor entirely flexible. Rather, auction markets with flexible prices for commodities like oil coexist with what Okun (1981) called "customer markets" with preset prices for most other commodities. Okun (1981) and Gordon (1981) developed the underlying economics of the dual flexible-fixed price economy, based on the heterogeneity of customer purchases across time and space that renders technically infeasible the Walrasian paradigm of the recontracting auctioneer standing "24 hours per day in the supermarket aisle conducting an auction for canned tuna fish."

The required condition for continued full employment is the opening of a gap between the growth rate of nominal GDP and the growth rate of the nominal wage (Gordon, 1984, p. 40) to make room for the increased nominal spending on oil. If nominal wages are flexible, one option is for the growth rate of wages to become negative, allowing the growth rate of nominal GDP to remain fixed. At the alternative extreme with rigid wages, to avoid a decline in non-energy output an accommodating monetary policy must boost nominal GDP growth by the amount needed to "pay for" the extra spending on oil, but this will lead to an inflationary spiral if expectations respond to the observed increase in the inflation rate. A third alternative, and the one that actually occurred in the 1970s, was a combination of wage rigidity with a partial response of nominal GDP growth, pushing down both real non-energy spending and employment.

By 1976 this model had made its way into the popular press when a *New York Times* headline announced, "A New Theory: Inflation Triggers Recession" (July 18, 1976, p. F 13). Indeed, we can see in Figure 2 that throughout the period 1974-81, there was a time *lead* of roughly one year of inflation relative to unemployment. This real-world result, that an adverse supply shock can depress real output and employment in a world of sticky non-oil prices, had been christened by Okun in 1974 conversations as a "macroeconomic externality." [11]

The process of integrating supply shocks into macroeconomics took place simultaneously during 1975-78 on three fronts, theoretical as described above, empirical as I have described elsewhere (2009), and in an unusual development, through a new generation of intermediate macroeconomic textbooks. An explanation was needed to reconcile the dominant role of demand shocks as the explanation of the Great Contraction of 1929-33 in the same model as would explain the positive correlation of inflation and unemployment in 1974-75. Once recognized, that explanation became obvious. Just as the output and price of corn or wheat could be positively or negatively correlated depending on the importance of micro demand or supply shocks, so

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11. Blinder (1981) subsequently extended the theoretical analysis to allow for rational expectations in the formation of wages and for a distinction between anticipated and unanticipated shocks. The topic was revisited by Ball and Mankiw (1995).

aggregate output and the rate of inflation could be positively or negatively correlated, depending on the relative importance of aggregate demand or supply shocks.

The textbooks appeared simultaneously in 1978 and both used alternative versions of a simple diagram that can be traced back to a classroom handout used by Dornbusch at the Chicago Business School in early 1975.[12] The diagram, which has the inflation rate on the vertical axis and either the unemployment or output gap on the horizontal axis, combines three elements – the expectational PC, shifts in that PC caused by supply shocks, and an identity that decomposes nominal GDP growth into inflation and output growth. The textbook version shows that the dynamic aggregate demand-supply model implies a simple first-order difference equation. Following a permanent upward or downward shift in nominal GDP growth, any lags in the formation of expected inflation cause the economy to cycle through loops to its new long-run equilibrium at a zero value of the unemployment or output gap and a permanently higher or lower rate of inflation.

The 1978 specification of the inflation process, which continues to be valid today for the U. S. economy, contains three sets of explanatory variables representing inertia, demand, and supply, leading me to call it the "triangle" model.[13] Replacing the expected inflation term is a set of long lags on past inflation, reflecting the view that the influence of past inflation reflects generalized backward-looking inertia, not just the formation of expectations. Important sources of inertia include the set of explicit and implicit contracts that dampen short-term changes in prices and wages (as recognized explicitly by Fisher, 1926), and the input-output supply chain that creates thousands of links of unknown magnitude and duration between changes in crude and intermediate goods prices and the prices of final goods, as emphasized by Blanchard (1987). All of these channels interact to create the "inertia" effect, the first leg of the triangle.

In the triangle model the speed of price adjustment and the speed of expectation formation are two totally different issues. Price adjustment can be delayed by staggered wage and price contracts, and by the time needed for cost increases to percolate through the input-output table, and yet everyone can form expectations promptly and rationally based on full information about the historical response of prices to their own lagged values, to demand shocks, and to supply shocks.

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12. The 1978 rival textbooks were by Dornbusch and Fischer and by myself. The dynamic version of the demand-supply model in the form of a first-order difference equation was confined to intermediate level textbooks, with many imitators published soon after. Elementary macro principles textbooks limited themselves to the display of static aggregate demand and supply curves, starting with Baumol and Blinder in 1979.

11. The "triangle" nomenclature has been picked up by a several authors, including Rudd-Whelan (2005) and Fitzenberger, Franz, and Bode (2008).

3.3 Explaining Why Prices and Wages are Sticky: New-Keynesian Economics (NKE)

The role of inertia is to make the inflation rate slow to adjust to changes in nominal demand, and as a result real GDP emerges as a residual, not as an object of choice as in the flexible-price market-clearing models of Friedman-Phelps-Lucas and much of modern macro. A large theoretical literature under the rubric of "New Keynesian Economics" (NKE), starting in the late 1970s with Fischer (1977) and Taylor (1980), contributed numerous models to motivate the inertia mechanism by explaining real and nominal rigidity of wages and/or prices, and many of these explicitly incorporated rational expectations.[14]   Some of this literature explicitly recognized that it was motivating the paradigm of non-market clearing (NMC) macro with coordination failures, as in the title of Ball-Romer's (1991) article "Sticky Prices As Coordination Failure" and the explicit treatment of coordination failures in Cooper-John (1988).

Also, the concept of macro externalities originated by Okun and implied by the Gordon-Phelps supply-shock theories of the mid-1970s appeared in a different context in the menu-cost models of Mankiw (1985) and Akerlof-Yellen (1985). When firms have market power, their choices of when and whether to change prices may hinge on small differences in profits one way or the other, but their choice not to change prices can have a large social cost. As Mankiw (2006) puts it, "a sticky-price equilibrium could be privately rational (or near rational) while socially very costly."

The NKE theoretical models of price and wage rigidity were complementary to the Clower-Patinkin-Barro-Grossman general equilibrium models. The former *explained* the stickiness of prices that had been *assumed* in the latter. However, the NKE theories provided few new insights on the implications of price stickiness for macroeconomic behavior or policy impacts; that was already evident in the dynamic supply-demand interaction featured as the centerpiece of 1978-era macro. This helps to explain Mankiw's (2006) conclusion that the NKE theories had little influence on policymaking in Washington, since policymakers found the large econometric models based on 1978-era macro to be adequate. To analyze the effects of price stickiness, you do not need to know why prices are sticky.

4. Toward a Critique of Modern Macro

A critical discussion of modern macro initially faces a set of semantic issues. We have already distinguished 1978-era macroeconomics from the frequent caricature of

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14. The theoretical NKE research literature is surveyed and placed in the perspective of historical puzzles of price and wage behavior in Gordon (1990).   A brief summary of several of the main contributions of NKE is provided by Mankiw (2006).

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Keynesian economics as inextricably wedded to a permanent negative inflation-unemployment tradeoff. Since this paper is only about the American theory of business cycles, no mention is made or critique intended of modern international monetary economics or long-run growth theory. A more serious semantic problem is the increasing fuzziness of the term "New Keynesian". In this paper the adjective "New Keynesian" is used as intended twenty years ago, to describe a set of theoretical papers by Ball, Fischer, Mankiw, Romer, and many others who explained the sources of nominal and/or real wage and price rigidity.

More recently, however, the term "New Keynesian" has been broadened to describe a set of models in which market clearing at the level of individual decision-making is incompatibly wedded to price stickiness of some form, which directly implies non-market clearing. In the recent literature reviewed here, consumption does not depend on current or permanent income, which could not be more non-Keynesian and less New Keynesian. In order to focus on central issues and avoid inessential complexities, we begin with Blanchard's (2008) "toy model" which he misleadingly describes as "New Keynesian." The model contains three equations, one for aggregate demand, a second for aggregate supply, and the third a Taylor rule to allow the response of interest rates to inflation and the output gap. There is no controversy about the Taylor rule, and so here we focus on the first two equations of the toy model and their embodiment in the Dynamic Stochastic General Equilibrium (DSGE) models that have become a common language among modern macroeconomists.

4.1 Blanchard's Workhorse Modern Macro Model

The toy model that Blanchard rightly describes as a "workhorse" for policy and welfare analysis begins with an aggregate demand relationship that dates back to Hall's (1978) application of rational expectations to consumption behavior. Aggregate consumption is derived from the first-order conditions of individual utility maximization of consumers. This implies that consumption is a function of the real interest rate and expected future consumption. Since there are no investment, government spending, or net exports in the basic model, aggregate demand likewise depends only on the real interest rate and expected future consumption. A background assumption is that producers are monopolists which have the power to set prices, and because marginal cost is less than price firms satisfy demand at existing prices.

The aggregate supply relationship is what has confusingly been called the "New Keynesian Phillips Curve," or NKPC. The inflation rate depends only on expected future inflation and on the output gap. The underlying theoretical formulation as developed by Galí-Gertler (1999) is based on a much-cited theoretical model by Calvo (1983), in which an arbitrary constraint prevents firms from adjusting their price continuously. Instead in a given period each firm has a fixed probability that it may

adjust its price in order to maximize expected profits, and the remaining probability that it must keep its price unchanged.

The problems with the aggregate demand equation are insurmountable in applications to the real-world economy for two equally important reasons. First, the most volatile elements of aggregate demand are missing. The absence of any theory of investment behavior misses the instability in the investment process inherent in the multiplier-accelerator interaction emphasized in the 1978-era model. Since the demand for consumer durables shares most of the properties of the demand for producers' durable equipment, a substantial share of consumption is missing as well. The absence of government spending misses fluctuations in military spending as a source of business-cycle volatility, especially in the first half of the post-war period. In fact the Ricardian equivalence framework assumed in modern macro (including DSGE models as discussed below) vitiates any possible effect on macro volatility of deficit-financed military spending changes, since crowding-out is complete.

The second basic flaw in the aggregate demand equation is the unrealistic assumption that only interest rates and expected future consumption matter for current consumption. Neither permanent nor transitory income matter at all. While originally derived in Hall's (1978) application of rational expectations to consumption behavior, this treatment of consumption behavior is denied by the much-cited result of Campbell and Mankiw (1990) that roughly half of income is earned by consumers whose consumption spending depends on current rather than permanent income. For at least this half of consumption expenditures the Campbell-Mankiw result supports the original 1936 Keynesian consumption function rather than the 1957 Friedman permanent-income hypothesis or the Modigliani life-cycle hypothesis.

Likewise there are three problems with the aggregate supply equation based in the NKPC. First, the reliance on purely forward-looking expectations is contradicted both by facts and by the underlying logic of the 1978-era Phillips Curve with the intrinsic backward-looking behavior based on staggered wage and price contracts and a web of producer-supplier relations extending back into the input-output table.[15] Second, the NKPC equation contains no terms to represent the impact of supply shocks directly on the inflation rate and indirectly on real output, depending on the nature of the policy response. Thus the NKPC approach has no explanation of why the inflation rate is sometimes negatively and sometimes positively correlated with the unemployment rate, a fact evident in Figures 1 and 2 above. Third, the NKPC does not recognize that prices are both flexible and sticky at the same time; the basis of the Gordon-Phelps supply-shock models discussed above is to combine flexible auction-market prices in the shocked oil market with sticky prices in the remaining non-oil

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15. For a demonstration that the NKPC tests between forward-looking and backward-looking behavior in Galí, Gertler, and Salido (2005) are biased toward acceptance of the former, see Rudd-Whelan (2005) and the assessment in Gordon (2009).

sector of the economy.[16]   The implied macroeconomic externality when adverse supply shocks cause recessions is completely missing from the NKPC, from the toy model, and apparently from the rest of modern macroeconomics.

Despite his enthusiasm for modern macro ("the state of macroeconomics is good"), Blanchard (2008) cannot swallow his own toy model and declares both the aggregate demand and supply equations to be "patently false." His critique of the demand equation joins ours by pointing to the absence of an investment equation and the fact that interest rate effects in the consumption equation are "hard to detect," but he misses the more basic failure of the Hall-based consumption function to introduce a channel of influence from current income for the Campbell-Mankiw half of consumers. Likewise he dismisses the purely forward looking formulation of the supply equation as "strongly at odds with the data" but misses the absence of supply shocks and the distinction between auction-market and preset prices.[17]

4.2 A Broader Perspective On What Is Missing

Stepping back from the toy model, one is dismayed by the absence of channels from a financial meltdown to the real economy, thus vitiating any connection between modern macroeconomics (to the extent that it is represented by the toy model) and the crises of either 1927-33 or 2003-09. There is no channel from current income to consumption, no wealth effects on consumption, no liquidity effects of credit tightening, no multiplier-accelerator mechanism for consumer durables or investment, and no role either for destabilizing military spending or stabilizing fiscal policy. The absence of current income liquidity constraints on families living from month to month, whether on small paychecks or on unemployment benefits, flies in the face of reality, especially in 2009. The elegant dual-decision analysis of Clower, Patinkin, and Barro-Grossman is far from the minds of macro economists. So we are forced to ask again the obvious questions, can households maximize utility in the expectation that they can work as much as they desire at the going real wage? It requires an investment of about ten seconds in reading print or electronic news reports to find every variety of example of households forced by external income and liquidity constraints to accept drastic reductions in their standards of living. Can firms sell all they want at the going real wage? Ask this question to the National Association of Auto Dealers and it will react with incredulity at the naivete of the question.

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16. For the underlying economics of why some prices are determined flexibly in auction markets while others are set by firms with monopoly power, see Okun (1981) and Gordon (1981).
17. Eventually while extolling the virtues of inflation targeting, Blanchard draws back and recognizes that with "more real wage rigidity than in a competitive labor market," an increase in the price of oil may "lead to a large decrease in the second-best level of output" and justify an allowance by policymakers for "some inflation". Surprisingly Blanchard cites a recent paper of his own for this startling realization with recognizing that it was developed by Gordon-Phelps in 1975 and 1978, respectively.

Modern macro is littered with contradictions resulting from its attempts to combine market clearing and utility maximization at the level of the individual household with a form of price rigidity or friction. Once the baby of full price flexibility has been thrown out, the bathwater must be changed because price rigidity is logically incompatible with market clearing. The Clower-Patinkin-Barro-Grossman Keynesian regime inevitably applies, effective supply and demand curves replace notional curves, and any source of declining aggregate demand will force households to reduce consumption due to income constraints and to work less than desired. The modern contradictions come when modern macroeconomists attempt to explain NMC outcomes with market-clearing language, or in Blanchard's (2008) words "movements take place along a labor supply curve . . .this may give a misleading description of fluctuations." Replace "may give" by "automatically give", because workers are thrown off their labor supply curves and firms are pushed away from market-clearing levels as the Patinkin effective labor demand curve (the position of which depends on the level of output) replaces the notional labor demand curve dependent on the real wage.

Can modern macro be exonerated by building more sophisticated structures than Blanchard's toy model? Since DSGE models are more complex versions of the toy model and have become, in Blanchard's words, "ubiquitous," it is worthwhile to examine them to determine if they repair the inadequate demand and supply equations of the toy model. The state of the art is represented by the much-cited models of Christiano, Eichenbaum, and Evans (2005, hereafter CEE) and Smets and Wouters (2007).

The CEE model combines the utility maximization by consumers as in the toy model with a more fully articulated treatment of value maximization by firms constrained by Calvo-like pricing rules and with an extra layer of intermediate goods production. The channel of monetary influence is not a Taylor rule for interest rate changes, but rather lump-sum payments by the monetary authority to households which deposit these payments in financial intermediaries, thus influencing the interest rate. Additional complexities include an explicit treatment of capital and capacity utilization. The CEE authors claim to have generated realistic features of the macro response to a monetary stimulus, including a prompt but temporary surge in output followed by a slow response of the price level.

Much of the controversy regarding DSGE results involves econometric and calibration methodology that is beyond the scope of this paper. Blanchard (2008) focuses on identification problems and the arbitrary choices of priors. "But, in practice, the approach has become rather formulaic and hypocritical. The priors used often reflect the priors of others, and, after backward recursion has traced their origins, have little basis in facts." Blanchard, despite his initial verdict that "the state of macro is good," concludes by throwing up his hands in despair: "it may make more sense to

recognize our ignorance and to allow part of the dynamics of our DSGE models to be data determined. True, this would make formal welfare analysis impossible."

Once the feasibility of "formal welfare analysis" is abandoned, then what attractions remain for the DSGE models based as they are on "patently false" aggregate demand and supply equations? In contrast 1978-era macro has no trouble with welfare analysis. Fluctuations in the output and unemployment gaps, mirror images of each other, are welfare-reducing, and gap-reducing policies are the right way to react to aggregate demand shocks. And in the Gordon-Phelps framework there is no welfare-enhancing way for policy to react to adverse supply shocks, since inflation targeting implies an output gap and output targeting implies accelerating inflation. The response of inflation to accommodative gap-reducing policies depends on the institutional environment, with the inflationary consequences of adverse supply shocks lower if there is no wage indexation and if past inflation has been well-contained by successful policies and/or the absence of previous adverse shocks. In this context the evident absence of a response of core inflation in the U. S. in 2003-08 to higher oil prices, discussed thoughtfully by Blanchard-Galí (2008), may a history of low core inflation during 1995-2003 made possible by a succession of beneficial (inflation-reducing) supply shocks in 1995-1999 as quantified in Gordon (2009) and many earlier papers estimating the "triangle model" described above in Part 3.

Buiter (2009) questions the relevance of DSGE models to the current crisis. He claims that modern macroeconomists work in a "complete markets paradigm" in which "intertemporal budget constraints are always satisfied by assumption [making] default, bankruptcy and insolvency impossible. . . as a result illiquidity is also impossibility." In contrast 1978-era macro with its Clower-like income constraints on consumers is the appropriate setting to discuss the consequences for illiquidity for the real economy, supported by Cambell and Mankiw's (1990) conclusion that half of consumption spending is current-income constrained, implicitly liquidity-constrained.

The accusation that market-clearing models require complete markets reminds us of the Okun (1981) and Gordon (1981) explanations of the co-existence of market-clearing auction markets for commodities like oil and gold, and price-setting customer markets in the rest of the economy. Complete markets would require a Walrasian auctioneer to achieve Say's Law for every product in every aisle of the supermarket at all hours of the day and night.

Tovar (2008) provides a critique complementary to that of Buiter, pointing to the absence in current DSGEs of "an appropriate way of modeling financial markets." As we have already pointed out, by ignoring the multiplicity of sources of business cycle fluctuations present in 1978-era macro, modern macroeconomists place too much weight on short-term productivity and preference shocks and impacts of monetary policy.

Excluded from consideration in Tovar's (2008) list are "financial vulnerabilities, illiquidity or the financial systems' procyclicality."

As noted above, Blanchard (2008) is self-contradictory by announcing that "the state of macroeconomics is good" while denouncing the main equations of its "workhorse" model as "patently false." He concludes by lamenting the herd mentality in modern macroeconomics in which an article "today often follows strict, haiku-like rules." The problem with these repetitive articles in the DSGE tradition is the "introduction of an additional ingredient in a benchmark model already loaded with questionable assumptions. And little or no independent validation for the added ingredient." He longs for the lifting of the haiku-like doctrinaire approach to macroeconomics and hopes for "the re-legalization of shortcuts and of simple models." Unfortunately, his conclusion says nothing about the basic contradiction between utility-maximizing market-clearing models and the arbitrary introduction into such models of price rigidity, which invalidates market-clearing assumptions and instead requires a NMC model.

Mankiw (2006) has a complementary set of complaints about modern macro and its DSGE incarnation. The factual inaccuracy of the central equations of the DSGE approach might seem to be offset by the appeal of "general equilibrium", but Mankiw reminds his readers that Hicks (1937) justified his IS-LM model as an attempt to put the ideas of Keynes into a general equilbirum setting. Using the confusing terminology that mixes together the admirable NKE contributions to the theory of price stickiness with the ad-hoc incorporation of price stickiness into DSGE models, Mankiw concludes that the "New Keynesians [i.e., the DSGE developers] can be criticized for having taken the new classicals' bait and, as a result, pursuing a research program that turned out to be too abstract and insufficiently practical." Mankiw goes on to complain that both the NKE theories of price stickiness and the confusingly labeled NKPC and DSGE models have not proven useful either to policymakers in Washington or in the teaching of intermediate macroeconomics to undergraduates. He concludes, in effect, that practical macroeconomics still means 1978-era macroeconomics.[18]

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18. Mankiw (2006) comes up with a remarkably astute comment about two generations of intermediate macro textbooks in the United States. "A generation ago, the three leading texts for this course were those by Robert Gordon, Robert Hall and John Taylor, and Rudiger Dornbusch and Stanley Fischer. Today, the top three sellers are those written by Olivier Blanchard, Andrew Abel and Ben Bernanke, and myself. The common thread is that each of these six books was written by at least one economist with graduate training from MIT, . . . where the dominant macroeconomic tradition was that of Samuelson and Solow. In all these books, the basic theory taught to undergraduates is some version of aggregate demand and aggregate supply, and the basic theory of aggregate demand is the IS-LM model."

5. Conclusion

This paper points out numerous similarities between the financial bubble and collapse of 2003-09 and the preceding bubble and collapse of 1927-32. It finds modern macroeconomics, defined as the market-clearing tradition embodied in the continuous utility and profit maximization of every DSGE model, to be lacking in relevance as an analytical tool suitable for tracing the links between the recent financial meltdown and the epochal downturn of the world's real economy. Unlike some recent critiques which attempt to discredit all macroeconomists for this failure, this paper resurrects the right model for the current crisis, no less than the Keynesian aggregate demand model as developed in 1936 as a response to the puzzle of the 1929-32 Great Contraction and equally suitable for understand the current downturn with its many similarities in origin and propagation mechanisms to the late 1920s.

However, this paper identifies a semantic problem with the application of Keynesian ideas to the current economic downturn, because the term "Keynesian" has been weighted down with so much semantic baggage that it cannot any longer be used with that terminology as a credible intellectual opponent to modern macro. The term "Keynesian economics" has been in disrepute for more than three decades, demonstrating the rhetorical success of Lucas and Sargent (1978) in applying tar and feathers to the Keynesian paradigm. Their accusation has stuck, that in 1978 Keynesian economics was lying in "wreckage" due to the empirical failure of the first-generation negative inflation-unemployment Phillips curve tradeoff. Yet this is a *non sequitur*, because there is no logical connection between Keynesian economics and the first-generation pre-1970 Phillips curve. The former is a theory of aggregate demand in a world of rigid prices, while the permanent negative tradeoff embodied in the first generation Phillips curves is a long discredited theory of aggregate supply that ignores expectations, the natural rate hypothesis, and supply shocks. The Keynesian aggregate demand model with fixed prices generates disequilibrium solutions in a non-market-clearing (NMC) setting but lacks by itself an aggregate supply sector that can explain the evolution of inflation.

By 1978 when Lucas and Sargent were dispensing their rhetorical flourishes, the Keynesian approach to NMC aggregate demand had divorced the first-generation Phillips Curve and had remarried a new and more sophisticated bride, the theory of policy responses to supply shocks in a world in which flexible auction-market prices for a commodity like oil interact with rigid prices for most of the rest of the economy. The marriage produced a dynamic aggregate demand and supply model which could trace a dynamic negative or positive correlation between inflation and unemployment in response to both demand and supply shocks in a world of backward-looking expectation formation. Discarding the term "Keynesian" as raising a red flag to modern macroeconomics, this paper calls the resulting marriage "1978-era macroeconomics" in honor of the two intermediate macro textbooks published in that year that successfully

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established the macroeconomic paradigm that remains dominant among Mankiw's (2006) policy-oriented "engineers" and in undergraduate courses on intermediate macroeconomics.

The demand side of 1978-era macroeconomics incorporates the sophisticated mid-1960s analysis in which consumption depends on current income, permanent income, and wealth, not just the interest rate and expected future consumption as in modern DSGE macro. This paper likens the stock market bubble of 1927-29 and its subsequent collapse to the American housing bubble of 2003-06 and its subsequent collapse, and our 1978-era paradigm traces the channels during the collapse phase between declining wealth and declining consumption expenditures, exacerbated by liquidity constraints and a dependence of consumption on current income as theoretically suggested by Clower (1965) and as empirically validated by Campbell-Mankiw (1990).

Similarities between the 1927-29 and 2003-06 bubbles run deeper than the stock market and housing bubbles, because both episodes were characterized by a Geanakoplos (2010) "leverage cycle." Parallel to the well-known securitization innovations as sources of overleverage in 2003-06 was the lesser known activity after 1926 of erecting a financial superstructure of holding companies, investment trusts, and other forms of intercorporate security holdings that came crashing down in the 1930s. Additional similarities between the two eras were the impact of capital gains on consumption in the 1920s and the newer phenomenon in the middle of this decade of consumption-boosting equity withdrawal as a part of mortgage refinance in a world of declining interest rates and ever-rising house prices. Regulatory failure in the late 1920s and 2003-06 also shares common features. Just as the stock market bubble of the late 1920s was exacerbated by the ability of stock market investors to borrow 90 percent of the cost of a stock, so the housing bubble of 2003-06 was exacerbated by the failure of regulators to impose stringent down-payment requirements for mortgages as is routine in countries as diverse as Canada and China.

The DSGE models of modern macro are handcuffed in advance by an inability to trace links between the financial and real sectors. In the pure version of such models as summarized in Blanchard's (2008) "toy model," both the aggregate demand and aggregate supply equations are deeply flawed and unsuitable for application to everyday business cycles, much less the worldwide crisis of the past two years. Consumption is the only component of aggregate demand and depends only on interest rates and expected future consumption, with the key links between financial and real markets simply omitted, including wealth effects, liquidity constraints, a dependence of consumption on current income, multiplier-accelerator interactions, imperfect alignment of inventories with sales, government military and fiscal policy shocks, and foreign shocks. The failure of the DSGE paradigm to provide an integrated treatment of other components of aggregate demand, including investment, government spending, and net

exports, forces the sources of business cycle fluctuations through a self-imposed corset of shocks to technology, consumer preferences, and monetary policy reactions, excluding the rich brew of cycle originators present in the 1978-era formulation. Because most of the plausible sources of economic downturns are missing, modern macro is often forced to rationalize its own empirically unexplained components of economic downturns with such implausible labels as "negative technology shocks" or "negative investment-specific technology shocks."

The supply side of the toy model and of most DSGE models is likewise handicapped by including in the inflation equation only expectations of future inflation and the current value of the output or employment gap (some versions substitute marginal cost, but this does not help, see Gordon 2009 and the references cited there). The key elements of the 1978-era demand-supply synthesis missing from modern macro are the basic distinction between expectation formation and the sources of backward-looking behavior through staggered overlapping contracts, and the absence of any treatment of supply shocks. The supply side of modern DSGE models contains no element that explains why inflation and unemployment are sometimes negatively and sometimes positively correlated, which is not surprising since efforts to simulate dynamic responses in such models have been limited thus far to monetary policy shocks, not supply shocks.

Ultimately the conflict between 1978-era macro and modern macro comes down to the market-clearing and continuous utility maximization of the DSGE consumer, in contrast to the solid NMC origins of 1978-era macro. In DSGE models there are no Clower-Patinkin-Barro-Grossman constraints that in a recession push effective demand curves to the left of notional demand curves and force households and firms to act against their will by cutting consumption when current income declines, or by cutting jobs when current sales fall below production and force inventory decumulation.

Because of its internal contradiction in attempting to combine continuous utility maximization with price stickiness, modern DSGE models are littered with contradictions. Once the baby of full price flexibility has been thrown out, the bathwater must be changed because price rigidity is logically incompatible with market clearing. The contradictions emerge when modern macroeconomists attempt to explain NMC outcomes with market-clearing language, or in Blanchard's (2008) words "movements take place along a labor supply curve . . .this may give a misleading description of fluctuations." Replace "may give" by "automatically give", because workers are thrown off their labor supply curves and firms are pushed away from market-clearing levels as the Patinkin effective labor demand curve (the position of which depends on the level of output) replaces the notional labor demand curve dependent on the real wage.

In the end, the problem with modern macro is that it contains too much micro and not enough macro. Individual representative agents assume complete and efficient

markets and market clearing, while the models ignore the basic macro interactions implied by price stickiness, including macro externalities and coordination failures. In an economywide recession, most agents are not maximizing unconditional utility functions as in DSGE models but are maximizing, i.e., trying to make the best out of a bad situation, under biting income and liquidity constraints. Perceptive comments by others as cited above reject the relevance of modern macro to the current cycle of overleveraging and subsequent deleveraging, because complete and efficient markets are assumed, and there is no room for default, bankruptcy, insolvency, and illiquidity.

This paper ends with an appeal to a broad spectrum of modern macroeconomists to follow Mankiw's policy-making "engineers" and teachers of intermediate undergraduate macro by re-learning 1978-era macroeconomics and dropping the adjective "Keynesian" due to its perjorative connotations. The 1978-era paradigm of aggregate demand features constrained individuals and firms who cannot in economic downturns maximize across their own first-best economic choices. That paradigm of aggregate supply has been fully implemented to explain why both inflation and unemployment were so high in the 1970s and so low in the late 1990s. Empirical success and common sense have triumphed over the endless search for deep micro foundations in a world in which macroeconomic interactions triumph over individual choice. Modern macro needs to go back to the drawing board and recognize that the integrated world view of 1978-era macro has been established and tested for more than 30 years and can no longer remained ignored and uncited.

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Figure 1. Scatter Plot of the Unemployment and Inflation Rates, Quarterly Data, 1960-80
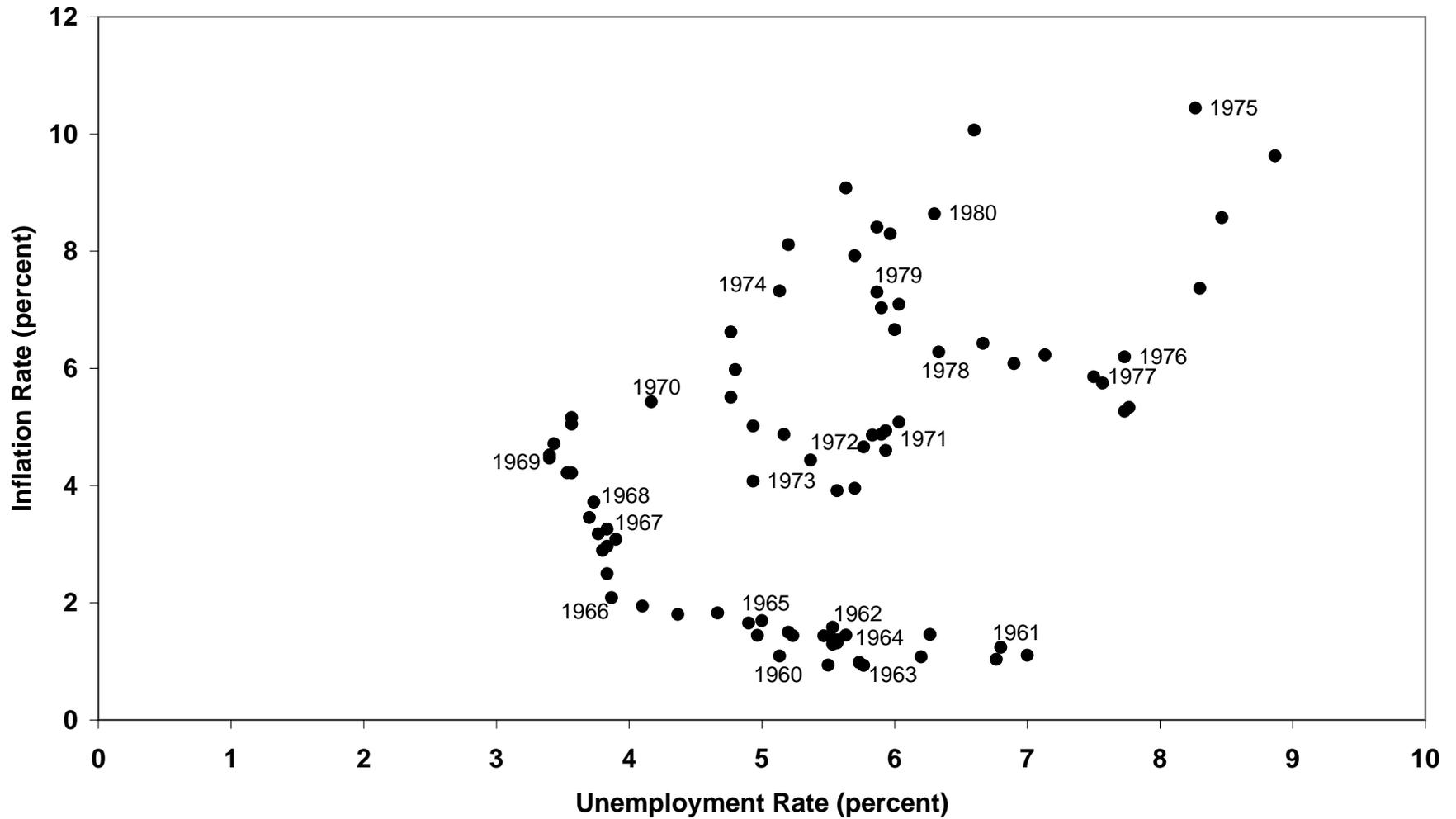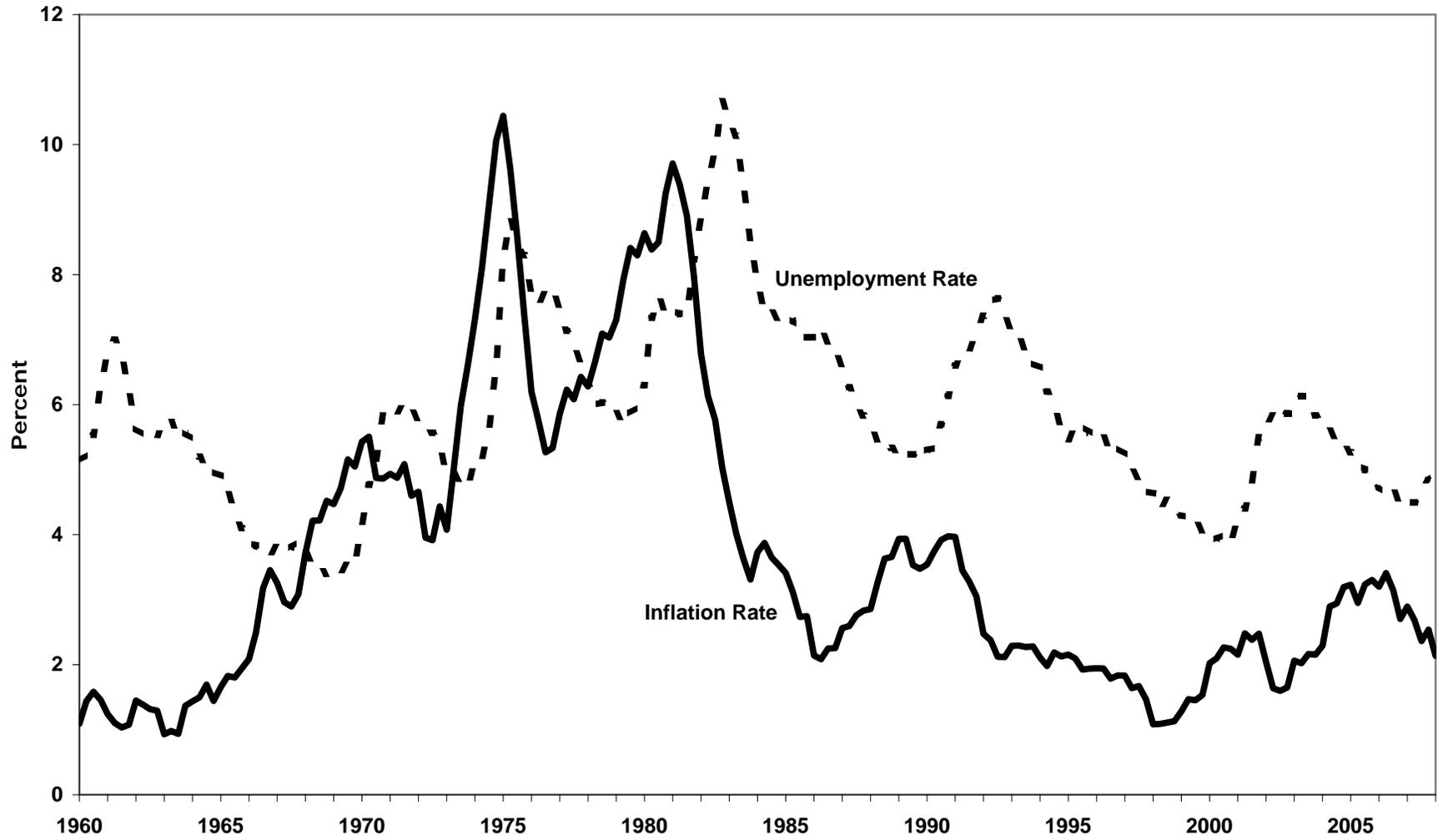
Figure 2. The Unemployment and Inflation Rates, Quarterly Data, 1960-2007

Source: Inflation rate is the four-quarter change in the headline PCE deflator.