

KEYNESIAN, NEW KEYNESIAN AND NEW CLASSICAL ECONOMICS

By B. GREENWALD and J. E. STIGLITZ¹

1. Introduction

FOR more than two centuries, there have been two opposing views of the capitalist economy. One stresses its virtues, and the efficiency with which prices carry information between consumers and producers, and allocate resources. The other spotlights the shortcomings of the market system, and particularly its episodes of massive unemployment of capital and labour. Adherents of the first group usually treat unemployment as a temporary aberration that market forces will cure if left to themselves. The New Classical Economists have gone further. They interpret changes in employment levels as rational agents' responses to perceived changes in relative prices: workers in 1932, for example, took more leisure because relative wages looked low. They liken unemployed capital to a spare tyre—spare capacity held for those few times when it is really needed. To the critics of capitalism, such views are dangerous, unscientific nonsense, misleading governments into acquiescing in the grave social and private costs of high unemployment. Keynes reconciled these conflicting views of capitalism. He confronted the unemployment problem, and argued that limited government intervention could solve it. Once unemployment was removed, the classical vision of the efficient market could be restored. Samuelson dubbed this the Neoclassical Synthesis.

The Neoclassical Synthesis was taken as an article of faith. Fundamental questions about the failures of the market system, such as the causes of periodic depressions and the unemployment that accompanied them, were avoided. Keynesian economics created schizophrenia in the way that economics was taught: microeconomic courses, in which students were introduced to Adam Smith's invisible hand and the fundamental theorems of welfare economics, were followed by macroeconomic courses, focusing on the failures of the market economy and the role of government in correcting them. Two sub-disciplines developed. Microeconomists criticized macroeconomists for their lack of rigour and theoretical foundations. Macroeconomists castigated microeconomists for the unrealism and inappropriateness of their theories. Dissatisfaction with Keynesian economics was also based on the want of explanation for some of its central assumptions, particularly concerning the sluggishness of prices and wages. Why did wages and prices not fall enough in recessions? Why didn't firms that wanted to sell more simply lower their prices? A quarter of a century of research failed to provide convincing answers to these questions. This state of affairs could not continue for long.

¹ Financial support from the National Science Foundation and the Hoover Institution is gratefully acknowledged. The authors wish to thank Peter Sinclair for comments on an earlier draft of this paper.

There were two ways in which the two sub-disciplines could be reconnected. Macrotheory could be adapted to microtheory; and the converse. New Classical Economics took the first approach. Its advocates aimed to derive the dynamic, aggregative behaviour of the economy from the basic principles of rational, maximizing firms and individuals. The School recognized the importance of dynamics for understanding macro-behaviour, and the central role of expectations in shaping those dynamics. It focused attention, then, on the consequences of rational expectation formation, and it is this aspect of their work which has given the School its alternative name, the Rational Expectations School.²

The other approach seeks to adapt microtheory to macrotheory. For the want of a better term, one can refer to it as the New Keynesian Economics. The phenomena of unemployment, credit rationing and business cycles are inconsistent with standard microeconomic theory. New Keynesian Economics aims to develop a microtheory that can account for them. There are numerous different strands to New Keynesian Economics, taken in its broadest possible sense. One major element is the study of imperfect information and incomplete markets.

This paper aims to present a broad outline of this aspect of the New Keynesian Economics, and to show how it resembles and differs from traditional Keynesian Economics. Keynes himself had a novel, and markedly non-neoclassical vision of how the economy worked. Keynes used picturesque language to describe the behaviour of entrepreneurs: they were moved by “animal spirits”. But when Keynesian economics came to be codified, and presented in the form of a simple model (as in chapter 18 of the *General Theory*, and the expositions of others, such as Hicks (1937) and Klein (1948)), earlier modes of thinking crept back. We contend that this vision, captured so well in many of his brilliant passages, provides greater understanding of unemployment and business cycles than do the formal Keynesian models.³

2. Some important Keynesian insights

Four of Keynes’ many insights we regard as essential to the explanation of unemployment and business fluctuations. These are:

²The leading proponents of the New Classical Economics, Barro, Lucas, Sargent and Wallace, have consistently based their models upon rational expectations. But their central doctrines derive not from rational expectations *per se*, but from the *old classical* assumption that markets always clear. It is this last assumption that leads directly to the conclusions that (involuntary) unemployment cannot exist, and that macro stabilization policy may well be ineffective. Neary and Stiglitz (1983) have shown that with rational expectations and price rigidities, government policy is even more effective than under myopic expectations: multipliers are even larger; and Buiter (1981) and Taylor (1985) provide numerous other examples where rational expectations do *not* imply policy impotence.

³Leijonhufvud (1968) expresses a not dissimilar view, although in terms of his distinction between Keynesian Economics and the Economics of Keynes, we would wish to classify chapter 18 of the *General Theory* as an early example of the former.

1. A general theory must account for the *persistence* of unemployment
2. A general theory must account for the *fluctuations* in unemployment
3. Savings and investment must be carefully distinguished
4. Disturbances in demand, not supply, underlie the cyclical behaviour of macroeconomic aggregates.

2.1. *The persistence of unemployment*

Keynes attributed the persistence of unemployment to the failure of wages to adjust with sufficient speed to clear labour markets, while at the same time stressing, in chapter 19 of the *General Theory*, that greater flexibility in money wage rates need not exert stabilizing effects. An assumption that money wage rates are frozen is integral to the Fixed Price School, exemplified, among others, by Barro and Grossman (1971). But this premise fails to square with evidence (money wage rates fell by one third in the Great Slump in the United States), and cries out for theoretical justification. In fact, Keynesian conclusions do not require absolute rigidity in money wage rates. All that is needed is that wages fail to fall to market clearing levels. As we shall see below, efficiency wage models offer a compelling set of explanations for the critical Keynesian contention that wage rates fail to clear the markets for labour.

2.2. *The fluctuations in unemployment*

Turning to the second issue, the fluctuations in unemployment, we face two questions. What is the source of shocks which cause them? Why do changes in prices fail to dampen their effects? The shocks that generate macroeconomic fluctuations are rarely, if ever, wholly exogenous to the economic system. Evidence suggests that they often take the form of changes in the demand for investment, and in particular for inventories. Yet if production functions are concave, and recessions are characterized by relatively low real wage and/or interest rates, intertemporal production smoothing should occur. Inventories should serve to limit fluctuations, not exacerbate them. Keynes rightly stressed the role of investment in macroeconomic fluctuations. But he attributed the changes in investment to animal spirits, to unexplained changes in expectations. His story is less than complete.

To account for fluctuations in unemployment, Keynes invoked changes in the demand for investment; but he also had to say why prices, and in particular interest rates, failed to change by enough to offset them. In the *General Theory*, he argued that nominal interest rates would fall little if money demand were highly interest-elastic. One difficulty here is that it is real, not nominal, interest rates that should matter for investment; real rates take account of the rate of price inflation. In fact, the slump of the 1930s saw prices fall, and real interest rates rose somewhat. There must also be doubts (vented by Keynes himself, if with greater emphasis in the *Treatise*

on Money than in the *General Theory*) about how much extra investment a given fall in interest rates could secure (and when).

The New Keynesian Economics offers a somewhat different account of the determination of investment, and in particular for the likely failure of interest rates to clear credit markets. These will be examined below. It also provides firm foundations for the tendency for swings in macroeconomic activity to become self-amplifying. But it has yet to furnish a complete explanation for the business cycle. It shows how shocks can induce protracted, major changes in investment and employment, but it treats such shocks as exogenous, not endogenous, phenomena.

2.3. *Savings and investment*

Keynes' third important insight that merits stress at this point is his distinction between savings and investment:

“Those who think (that an act of individual saving leads to a parallel act of investment) . . . are deceived They are fallaciously supposing that there is a nexus which unites decisions to abstain from present consumption with decisions to provide for future consumption; whereas the motives which determine the latter are not linked in any simple way with the motives which determine the former” (*General Theory*, p. 21)

One aspect of this distinction is the difference between funds within the firm, and funds at the disposal of households. If capital markets were perfect, this difference would carry no particular implications for the spending of households and firms. In his *Treatise on Money*, Keynes had written at length about what he called the Fringe of Unsatisfied Borrowers, and the wider economic significance of credit rationing (chapter 37, section (iii)(b), and elsewhere). These powerful ideas are almost eclipsed in the *General Theory*, although a definite echo can be found on p. 158. One can rationalize Keynes' claim that it is current income that exercises the dominant influence upon consumers' spending two ways: either current income may be taken as a good forecast of (unobservable) future income, or else capital market imperfections may be adduced to explain it. It is the latter view, pursued by Flemming (1973) among others, upon which the New Keynesian Economics lays most stress.

2.4. *Supply and demand*

Keynes needed, as we said, to find a source of fluctuations in economic activity. It was apparent that changes in technology, in supply, could not account for what was occurring in the Great Depression. He therefore naturally turned to changes in demand. Those brought up in the Marshallian tradition were schooled in analysing demand and supply disturbances separately.

Keynes' reliance on the Marshallian demand/supply framework posed problems which he, and his followers, never satisfactorily resolved. For the

Marshallian theory suggested that equilibrium ought to be at the intersection of demand and supply; if firms were on their supply curves, real product wages should rise as employment falls. This was one of the first empirical propositions of Keynesian economics to fall by the way-side. But just as Marxian economics was never abandoned by its proponents, simply because its predictions turned out to be wrong, so too Keynesian economics was not to be abandoned simply because one of its empirical predictions was unconfirmed. There are three ways of dealing with uncomfortable facts: (a) to deny them, e.g. by asserting that wages and prices are measured incorrectly (just as the New Classical economists approach the unemployment problem by denying the relevance of the unemployment statistics); (b) to provide a new interpretation, e.g. by asserting what is relevant is not the spot wage, because of the existence of long term (implicit) contracts, ignoring the fact that real product wages of newly hired workers or workers on spot contracts also did not rise significantly; (c) to assert that the empirical proposition was not central to the theory. Thus, a large literature developed, asserting that firms, while solving quite complicated intertemporal maximization problems, acted as if the price and quantities they faced were fixed. It was simply asserted that firms did not use price policy to affect sales, an implausible and counterfactual assumption.⁴

3. The New Keynesian Economics

The New Keynesian Economics begins with Keynes' basic insights. But it recognizes the need for a more radical departure from the neoclassical framework, and for a much deeper study of the consequences of imperfections in capital markets, imperfections which can be explained by the costs of information. The major ingredients of this new perspective are:

1. Efficiency wage theories
2. Capital market imperfections
3. Credit rationing
4. A revised view of the role of monetary policy

We examine each in turn.

3.1. *Efficiency wage models*

Efficiency wage models⁵ are based on the hypothesis that there is imperfect information about the characteristics of workers; that the actions

⁴ Models which postulate imperfectly competitive firms explain why real wages may not equal the value of the marginal product; but they have little to say about involuntary unemployment (indeed, in contrast to models with classical unemployment, with real wages in excess of the value of the marginal product, here real wages are less than the value of the marginal product; whether employment is higher or lower in equilibrium simply depends on the (uncompensated) labour supply elasticities) or about its fluctuations. Below, we provide an explanation for cyclical variability in mark-ups. See also Stiglitz (1984).

⁵ For surveys of efficiency wage theories, see Stiglitz (1986a, 1986b).

of individual workers cannot be adequately monitored; and that it is not possible to write contracts that ensure that the worker bears all the consequences of his actions.

As a result, the quality of the labour force, its productivity (and hence the firm's profits) may increase with the wage paid. Similarly, labour turnover may decrease with an increase in the wage, and since the firm must bear some part of the turnover costs, again profits may increase with an increase in wages, up to some point. In the face of unemployment, wages may not fall, for firms will recognize that if they lower wages, productivity will decrease, turnover may increase, and profits will fall. In this perspective, firms are competitive; there are many firms in the market; but nonetheless firms are wage setters, at least within a range. If the Walrasian wage, where the demand for labour equals the supply, is too low, any firm has the option of raising its wage and thus increasing its profits. The *efficiency wage*, the wage that maximizes the firm's profits, may of course vary with economic circumstances; hence the wage is not absolutely rigid. But wages need not fall to market clearing levels.⁶

It can be objected that the presence of wage rigidities in some sector(s) of the economy is not sufficient to explain unemployment.⁷ So long as there is some sector with flexible wages, any individual who chooses not to work there is voluntarily unemployed. We view this to be largely a semantic objection: the fact is that individuals who are observationally indistinguishable from the unemployed individual are being employed at higher wages; that the market equilibrium is inefficient; and that resources which could be productively employed remain idle.⁸

Efficiency wage theories explain why wages may fail to clear labour markets. Analogous models for capital markets can explain why interest rates may fail to achieve equality between the demand and supply of credit (Stiglitz and Weiss 1981, 1983, 1985). More generally, Akerlof and Yellen (1985) have pointed out that even when firms should change the wages they pay they may not do so; they show that the loss of profits from this

⁶ Thus, the policy implications of these theories may be markedly different from those of the standard fixed wage-price models. The latter assume that economic policy has no effect on the wages paid. The efficiency wage models recognize that certain policies (e.g. unemployment compensation) may have strong effects on equilibrium wages, and the consequences of this need to be taken into account.

⁷ This is, of course, not the only objection to efficiency wage theory. For a more extended discussion, see Stiglitz (1986b).

⁸ Elsewhere (Greenwald and Stiglitz (1986b)) we have discussed a variety of reasons why it may be rational for an individual to reject a low wage now, if he believes that a better paying job will become available in the near future. These have to do with asymmetric information, with the information conveyed by the individual's willingness to accept a low wage job as well as with the fact that once someone is unemployed, he becomes "used labour" with adverse effects on future wages similar to those that arise in Akerlof's (1970) lemons model (see Greenwald (1986)). We have also discussed why a worker might wish to decline an employer's offer of a low wage now, coupled with a higher wage in future if the firm survives, because to accept it would, in effect, make the worker take an equity position in the firm (Greenwald and Stiglitz (1987)).

near-rational behaviour may be small, even though the loss to society may be large. Indeed, if firms are risk averse (as we argue below they will be), and if there is some uncertainty about the consequences of wage changes, keeping wages unchanged in the face of certain disturbances is fully-rational. Again, similar arguments hold for the capital market.

Moreover, the efficiency wage models further show why the wages of firms are interdependent: the optimal wage for any one firm depends on the wages paid by all other firms. This interdependence may lead to multiple equilibria, in which no firm changes its wage even in the face of changes in its demand.⁹ Thus, by explaining wage, interest rate, and price rigidities, these theories help to explain why certain disturbances are amplified as a result of the repercussions they induce within the economic system, rather than dampened.

There is a further set of reasons for the “multiplication” of disturbances. In the presence of incomplete markets and imperfect information, the actions of one firm or individual exerts externality-like effects on others; the reduction of production by one firm, in response to increased uncertainty or a reduction in its working capital, increases the uncertainty and reduces the working capital of other firms. While price adjustments tend to dampen disturbances, externality effects may (and in these instances do) exacerbate them.

3.2. *Capital market imperfections*

Capital market imperfections derive from imperfect information. There are asymmetries of information between managers of firms and potential investors, asymmetries which can give rise to what one can call “equity rationing.” Equity rationing matters because it means that if firms wish to obtain more capital, to invest or to increase production, they must borrow the funds; and even if they are able to do so, they must expose themselves to considerable risk, including the risk of bankruptcy (the risk of not being able to pay back the promised amounts).

The consequences of this are exacerbated by the absence of futures markets. Thus, firms cannot sell the goods which they plan to produce until after they have produced them. Every production decision is a risk decision, a risk which they (the managers and equity holders) must bear, and which they cannot easily shift on to others. The absence of futures markets implies that firms cannot sell their output at the time of production.

Thus, an analysis of firm behavior must focus on its willingness to undertake these risks. Unexpected changes in its working capital base (caused for instance by unexpected changes in the prices at which it can sell its existing stock of goods) could, for instance, have a deleterious effect on its willingness to produce.

⁹ Again similar arguments hold for the capital market and the product market.

3.3 *Credit rationing*

While at times considerations of potential risk limit the amount that firms are willing to produce, at other times, firms' access to capital is limited; there is credit rationing. The reasons that suppliers of capital do not raise interest rates in the presence of an excess demand for capital are analogous to the reasons that firms do not lower wages in the presence of an excess supply of labour: increasing interest rates may lower the expected return to the supplier of capital, either because of selection effects (the mix of applicants changes adversely) or because of incentive effects (borrowers are induced to undertake riskier actions.)

3.4. *A revised view of the role for monetary policy*

Monetary policy exerts its influence—when it does—not so much through the willingness of individuals to hold cash balances, but through the availability of credit. Asymmetries of information imply that if banks decide to lend less, there are not other potential lenders who are perfect substitutes. Banks' decisions to lend are analogous to those determining firms' willingness to produce. The monetary authorities can take actions which affect banks' willingness to lend (or the terms under which they are willing to lend.) Though, depending on the economic circumstances, other lenders may take partially offsetting actions, their actions can never be fully offsetting.

3.5. *A new general theory*

The New Keynesian Economics provides a general theory of the economy, derived from micro-economic principles (and thus integrates the two sub-disciplines.) It succeeds both in filling the lacunae in traditional Keynesian theory (e.g. by explaining partial wage rigidities, rather than simply assuming rigid wages) and resolving the paradoxes and inconsistencies of more traditional Keynesian theory (both the internal inconsistencies, e.g. concerning how expectations are formed, and the inconsistencies between its predictions and observations.) It provides an explanation both for an equilibrium level of unemployment (through the efficiency wage theories) and for business fluctuations.¹⁰ The theory of business fluctuations it provides is simple: in broad outline, certain shocks to the economy affect the stock of working capital of firms. Even if firms had perfect access to the credit markets (that is, they could borrow as much as they wished, at the actuarially fair interest rate), the amount they would be willing to borrow is limited by their willingness to bear risk; the fixed commitments associated

¹⁰ This is not to say that there are not important gaps in the theory which remain. The theory developed so far does not provide an entirely endogenous business cycle; it only explains how the economy responds to certain shocks.

There remains a controversy over whether an entirely endogenous business cycle theory is required, or whether one should be content with a theory which translates certain kinds of shocks into disturbances in which the economy persists below "full employment" for a number of periods. We do not take a position on that issue here.

with loan contracts implies that, as the working capital which is available is reduced, the risk (bankruptcy probability) associated with any level of borrowing increases. Thus, if their working capital is reduced, their desired production level (given that they do not have fixed commitments to sell their products¹¹) is lowered; and it takes time to restore working capital to normal levels. The theory explains not only why both aggregate shocks (like an unexpected decrease in the price level, resulting from a monetary shock) and sectoral shocks (like an unexpected shift in demand, or the unexpected formation of an oil cartel) would exert aggregative effects: willingness to produce will, in general, be a concave function of working capital, and hence a redistribution of working capital will have aggregative effects.¹²

In the discussion below, we shall show how this theory provides an explanation for several of the phenomena which seemed so hard for more traditional Keynesian theory to explain: (a) it explains why firms do not lower prices in recessions, i.e. it explains cyclical movements in mark-ups; (b) it provides an explanation of cyclical behaviour of investment and inventories; (c) it provides an explanation for why unemployed workers do not succeed in getting hired by offering to work for lower wages, and even in industries where efficiency wage considerations are not important, it provides a partial explanation for why workers do not offer to work for lower wages, in return for the promise of higher wages in the future; and (d) it provides an explanation for why an unanticipated wage-price reduction might actually serve to exacerbate the recession, rather than alleviate it (by further deteriorating the working capital base of firms).

4. Some shortcomings in Keynes, and the new Keynesian resolution

It is a matter for regret that Keynes' summary of his arguments in chapter 18 of the *General Theory*, and the formal modelling of Keynes' thinking by many later writers, relied so much upon the neoclassical and Marshallian tools which then, as now, were the style of the day.¹³ A much richer picture emerges from the *General Theory* taken as a whole. Yet this picture is

¹¹ Even if they have commitments, potential purchasers may not honour those commitments, particularly in the event of their bankruptcy. In recessions, the risk associated with any "commitment" is increased.

¹² These redistribution effects seem to be at least as important as others sometimes postulated with government debt policy (the change in the maturity structure of the debt having either an intertemporal or an intratemporal redistribution effect) or with some forms of insurance.

The redistribution resulting from insurance associated with implicit labour contracts, a redistribution from the corporate to the household sector, operates essentially through the mechanism described above. In the presence of perfect capital markets, the only effects arising from that redistribution would be those associated with differing marginal propensities to consume between capitalists and workers.

¹³ Quite possibly the reason for this was that, to win acceptance for the new ideas, Keynes and his expositors wished to demonstrate that only a few changes in the basic assumptions that underlay much conventional thinking about the economy, could lead to dramatically different results.

defective in certain respects, particularly in its treatment of the firm and the role of money, and, underlying these, its analysis of capital markets.

4.1. *Equities and bonds*

One weakness was Keynes' aggregation of long term bonds and equities (as may be seen, for example, in footnote 1 on p. 151 of the *General Theory*). Even in the absence of bankruptcies, these two sets of assets differ in their risk properties. Recessions raise bond values; equities fall. This makes them highly imperfect substitutes from the investor's standpoint. Still more important are the differences in the nature of the firm's commitment: with bonds and loans, the firm is committed to paying back a certain amount on a particular date; with equities, no such commitment exists. As a result, for firms as well as investors, these two securities are far from perfect substitutes. Particularly in recessionary periods, firms seldom resort to the equity market to raise needed capital: investors suspect that any firm wishing to do so is in bad straits, unable to obtain capital from banks or other sources. Elsewhere, we (Greenwald, Stiglitz, and Weiss (1984)) have provided a simple adverse selection model in which only the worst firms will in fact resort to the equity market to raise capital.

4.2. *Supply and demand again*

Keynes' attempt to explain economic fluctuations in terms of demand considerations alone not only posed the quandary we have referred to before—why don't firms use price policy to increase their sales—but posed another problem: how could a small open economy ever face Keynesian unemployment problems? Simply by changing its exchange rate, it could face unlimited demand for its products.

In our theory, there is not a clean distinction between demand and supply. Firms would be willing to produce more, if they could have an assured demand. In this sense, demand is limiting production. Firms are not willing to produce more, given the risks associated with production in the absence of an assured demand. In this sense, firms are on their supply curve. Our theory thus explains why the amount of goods firms are willing to supply, at any expected real product wage, may change over the business cycle.

Our theory can also explain why firms, in setting their prices, might attempt to have a higher mark-up over costs in recessionary periods. In markets with imperfect competition and imperfect information, firms must recruit customers. They do so partially by using price policies. They thus face a trade-off, lower prices today leading to higher future sales, higher future profits, but lower current profits. The price they choose depends on the *implicit* cost of capital (not the market rate of interest), and in the presence of equity rationing, this may be higher in recessionary periods.

4.3. *Investment*

Keynes argued that the primary determinant of the level of investment, for a given set of expectations, was the interest rate. Though there has always been some ambiguity about whether this is the real or nominal interest rate, the only sense that one can make of this is that it must have been the real interest rate. But real market interest rates have fluctuated relatively little (until the 1980s). A good theory should never take a constant (or an almost constant) as an explanatory variable.

In our theory, credit availability at certain times is the major determinant of the level of investment. It is precisely at those times that monetary policy can affect the level of economic activity. In recessionary periods, however, banks may be willing to lend to any “good” prospect at the going interest rate, but there is a shortage of willing borrowers. In such circumstances, monetary policy is likely to be ineffective.

The Keynesian-neoclassical theory simply cannot explain inventory fluctuations, the fact that inventories serve to exacerbate rather than to dampen fluctuations. Our theory can. Again, the increase in the effective cost of capital—the result of equity rationing and the decrease in the supply of working capital—implies that firms will wish to decrease their inventories in recessionary periods.

4.4. *The monetary mechanism*

The mechanism by which the monetary authorities affected the level of economic activity in Keynesian analysis is implausible. There are three steps: (a) the government takes actions which affect the money supply; (b) given individuals’ demand functions for money (a function presumably of interest rates and income), interest rates change; (c) as a result of interest rate changes, investment changes.¹⁴

There are problems with each of the steps: while the government may be able to affect the supply of outside money, there are close, near money substitutes, at least for transactions purposes. Moreover, money is not required for most transactions, only credit. (This is what makes those models which are based on the cash-in-advance constraint so implausible.) And to the extent that money is required for transactions purposes, one must explain why that is so. Moreover, the relationship between transactions and income is tenuous: many, perhaps most, transactions are exchanges of assets, and the kinds of economic changes associated with the

¹⁴ This is obviously an oversimplification. In some variants of the theory, the demand for money depends only on income, and hence, given rigid prices, a decrease in the supply of money must be accompanied by a decrease in income. No plausible mechanisms by which this is effected have been put forward.

In other theories, the demand for investment is a function of expected future incomes, which in turn are a function of current income. The fluctuations in investment then become as much a consequence as a cause of income fluctuations. It is hard to reconcile such naive accelerator models with rational behaviour.

business cycle are often accompanied by changes in wealth, and hence in asset distribution.

To the extent that money demand is based on asset considerations, what is relevant, of course, is not income, but wealth. And since there are short term bonds which are, except for transactions purposes, perfect substitutes for money, the relevant opportunity cost of holding money is the short term money rate of interest; but if any interest rate is relevant for investment, it should be the real rate of interest.¹⁵ Moreover, as the recent development of Cash Management Accounts makes clear, it is clearly feasible to provide interest bearing "money," in which case the only relevant question facing the individual is the maturity structure of the debt which he wishes to hold.

More recent Keynesians (e.g. Tobin (1969)) have proposed another mechanism by which monetary policy affects economic activity: In the general portfolio approach, different assets (short term, long term bonds) are seen as imperfect substitutes, and changes in the relative supply affect different interest rates, and, in particular, the price of equities. This can be criticized on several grounds. First, firms do not, for the most part, resort to the equities market to raise capital. Thus the price of equities is not directly relevant. How can we explain the observed correlations? In our theory, optimistic expectations, say about future sales, will be reflected in a high price of equities (high future profits), and in managers' willingness to produce. There is a correlation, but not causation.

To put it another way, what managers and controlling stockholders are concerned about is not the price of equities today, but the price of equities when they go to sell their shares. The current price may be a good forecast of future prices, but businessmen are more likely to base their judgments concerning particular investment projects not on the judgments of some relatively uninformed outsider, but on their more well informed insider views.

Secondly, in theory, changes in the maturity structure of the government's debt should have no effect on the market equilibrium, provided that there are not significant redistributive consequences of that change (and these seem implausible.) For those changes represent changes in the (stochastic) future tax liabilities of individuals. Individuals, in deciding on their optimal portfolios, should take into account other aspects of the risks which they face, including wage and tax risks; and if they do this correctly, there will be no effects on real interest rates. The Tobin approach would, in a perfect capital market, seem to rely on irrational behavior.

Actually, we are sympathetic with the Tobin portfolio approach, because

¹⁵ It is not clear whether it should be the long term or short term real interest rate. When the question is, when should a project be undertaken, the short term real interest rate is presumably relevant; when the question is, should a project be undertaken, it is presumably the long term real interest rate. Since the information relevant to undertaking a project (the set of suppliers, the prices at which factors can be purchased, etc.) becomes obsolete so rapidly, in many cases at least the question posed by firms is more the latter than the former.

these results on the Irrelevance of Public Financial Policy depend critically on the existence of a perfect capital market, an assumption which we have previously called into question. But the mechanism by which investment is affected is not through the change in interest rates or the price of equities, but through the availability of credit.

5. Concluding remarks

5.1. *On methodology*

Capitalist economies are complicated. A model is supposed to capture its central features, not reproduce it exactly. Decisions of individuals and firms today are based on future expectations, and are affected by past decisions. Individuals do not have perfect foresight or rational expectations concerning the future. The events which they confront often appear to be unique, and there is no way that they can form a statistical model predicting the probability distribution of outcomes. And there is little evidence that they even attempt to do so. At the same time, individuals are not myopic. They do not simply assume that the future is like the present.

Markets are not perfect. But markets do exist. Prices do adjust. Wages fall in the presence of massive unemployment. These “facts” pose some important strategic decisions for the modeller: within the foreseeable future, it is not possible to construct a dynamic model adequately reflecting all of them. Polar cases are easier to study. Should one assume perfect wage or price flexibility or no wage or price flexibility? Rational expectations or myopia? Any set of choices is open to criticism, but equally, can be defended as part of a long term research strategy.

In our view, the choices must be dictated by the phenomenon to be studied. If this is unemployment, to begin the analysis by assuming market clearing is to assume away what is to be explained. Important as it is to understand the dynamic maximization problems individual and firms are engaged in, ignoring the important constraints they face (e.g. on the access to capital markets) results in models which are of little relevance. We suspect that in many instances, myopic models focusing on the constraints are far better than “rational” models ignoring them. Indeed, in some cases, one can show that the rational models with constraints look identical to the standard myopic models (e.g. with rule driven behaviour, all of profits and none of wages saved.)

5.2. *On policy*

There has been a long standing controversy over what governments should do in the face of unemployment: (a) nothing; (b) encourage wage reductions; (c) use monetary policy; or (d) increase government expenditures. The success of Keynesian theory has much to do with the fact that it provided a theoretical justification for those who wished to take the fourth course. The success of the New Classical theory has much to do with the

fact that it has provided a theoretical justification for those who wished the government to do nothing.

In our view, Keynes' policy conclusions were basically correct. Government policy can affect the outcome; in recessionary periods, monetary policy is likely to be of limited efficacy; and wage cuts may not be effective.¹⁶

5.3. *On the efficiency of the market economy*

Though a half-century of experience may make us less sanguine about the government's ability to eliminate business fluctuations, a half-century of experience with alternative forms of economic organization have made us even less sanguine about the ability of these alternatives to provide the basis of a more efficient system of resource allocation. Like the emperor's new clothes, we may not be able to see the invisible hand because it is not there; or perhaps more accurately, because it is so invisible, we do not see how palsied it is. Unemployment is but the worst manifestation of pervasive market failures which arise in the presence of imperfect information and incomplete markets. But if the invisible hand of the market is palsied, the visible hand of the government *may* be far worse. Leibniz¹⁷ and J. B. Cabell's optimism¹⁸ was wrong: we do not live in the best of all possible worlds. We live in an imperfect world. And we must learn to live with those imperfections. Might not limited government intervention—correcting the worst manifestations of market failures, including massive unemployment—after all be the wisest policy to follow? In the end, Keynes, and Keynesian policies, are vindicated.

Bell Communications Research, Morristown, N.J.
Princeton University, and
The Hoover Institution, Stanford University

REFERENCES

- AKERLOF, G. (1970), 'The Market for Lemons: Qualitative Uncertainty and the Market Mechanism', *Quarterly Journal of Economics*, 84, 288–300.

¹⁶ In Keynes' *General Theory*, wage cuts may reduce aggregate demand (ch. 19). In more modern treatments, where consumption is based on permanent income, such wage cuts might have a negligible effect on demand. Our theory provides an explanation of why wage cuts could have a significant effect: imperfect capital markets results in some individuals having to reduce their consumption. On the other hand, there are circumstances in our theory where a wage cut would be effective: when each firm chooses not to reduce its wage, given the wages paid by other firms, a coordinated wage change can increase the demand for labour. Our theory suggests, however, that there are other circumstances where lowering real wages (below the efficiency wage) would actually result in a reduction in the demand for labour.

To the extent that lower wages lead to lower prices, wage reductions can have future deleterious effects, in reducing the working capital available to firms, and in making them more reluctant to produce, if they extrapolate current declines in prices to continue in the future.

¹⁷ Leibniz (1710), First Part of the Essays on Divine Justice, Human Freedom and the Origin of Evil, § 8.

¹⁸ Cabell (1926), book iv, ch. 26.

- AKERLOF, G. and YELLEN, J. (1985), 'A Near Rational Model of The Business Cycle with Wage and Price Inertia', *Quarterly Journal of Economics*, 99, 832–8.
- BARRO, R. J. and GROSSMAN, H. I., (1971), 'A General Disequilibrium Model of Income and Employment', *American Economic Review*, 61, 82–93.
- BUITER, W. H. (1981), 'The Superiority of Contingent Rules over Fixed Rules in Models with Rational Expectations', *Economic Journal*, 91, 647–70.
- CABELL, J. B. (1926), *The Silver Stallion*.
- FLEMMING, J. S. (1973), 'The Consumption Function when Capital Markets are Imperfect: The Permanent Income Hypothesis Reconsidered', *Oxford Economic Papers*, 25, 160–72.
- GREENWALD, B. and STIGLITZ, J. E. (1986a), 'Externalities in Economies with Imperfect Information and Incomplete Markets', *Quarterly Journal of Economics*, March.
- (1986b), 'Information, Finance Constraints and Business Fluctuations', *Proceedings of the Taiwan Conference on Monetary Theory*, Taipei, Chung-Hua Institute.
- 'Imperfect Information, Credit Markets, and Unemployment' (1987) *European Economic Review* (forthcoming).
- and WEISS, A. M. (1984), 'Informational Imperfections and Macroeconomic Fluctuations', *American Economic Review* papers and proceedings, 74, 194–9.
- HICKS, J. R. (1937), 'Mr Keynes and The Classics', *Econometrica*, 5.
- KEYNES, J. M. (1930), *A Treatise on Money*, Macmillan, London.
- (1936), *The General Theory of Employment, Interest and Money*, Macmillan, London.
- KLEIN, L. R. (1948), *The Keynesian Revolution*, Macmillan, London.
- LEIBNIZ, G. W. (1710), *Essais de Théodicée sur la bonté de Dieu, la liberté de l'homme et l'origine du mal*, Amsterdam.
- LEIJONHUFVUD, A. (1968), *On Keynesian Economics and The Economics of Keynes*, Oxford University Press, New York.
- NEARY, J. P. and STIGLITZ, J. E. (1983), 'Towards a Reconstruction of Keynesian Economics: Expectations and Constrained Equilibria', *Quarterly Journal of Economics* Supplement 97, 199–228.
- STIGLITZ, J. E. (1984), 'Price Rigidities and Market Structure', *American Economic Review* papers and proceedings, 74, 350–6.
- (1986a), 'Theories of Wage Rigidities', paper presented to Conference on Keynes' Economic Legacy, University of Delaware, 1983, in *Keynes' Economic Legacy*, Praeger, New York.
- (1987), 'The Causes and Consequences of the Dependence of Quality on Price', *Journal of Economic Literature* (forthcoming).
- STIGLITZ, J. E. and WEISS, A. M. (1981), 'Credit Rationing in Markets with Imperfect Information', *American Economic Review*, 71, 393–410.
- (1983), 'Incentive Effects of Terminations: Applications to the Credit and Labor Markets', *American Economic Review*, 73, 912–27.
- (1985), 'Credit Rationing and Collateral', paper presented at CEPR conference, Oxford, September 1985.
- TAYLOR, J. (1985), 'Rational Expectations Models' in K. J. Arrow and S. Honkapohja (eds.) *Frontiers of Economics*, Blackwell, Oxford.
- TOBIN, J. (1969), 'A General Equilibrium Approach to Monetary Theory', *Journal of Money Credit and Banking*, 1, 15–29.