The Case against Conservative Macroeconomics: An Inaugural Lecture
Author(s): George A. Akerlof
Source: *Economica*, New Series, Vol. 46, No. 183 (Aug., 1979), pp. 219-237
Published by: Wiley on behalf of The London School of Economics and Political Science and The Suntory and Toyota International Centres for Economics and Related Disciplines
Stable URL: http://www.jstor.org/stable/2553741
Accessed: 17-09-2017 14:21 UTC

Economica, **46**, 219–237

The Case Against Conservative Macroeconomics: An Inaugural Lecture

By GEORGE A. AKERLOF

London School of Economics

INTRODUCTION

Keynesian economics has now reached middle age. With these advancing years the claims of her traditional rival, the quantity theory, have shown their endurance, while a young offspring of the old classical theory, called the New Classical Economics, threatens to take the centre of attention from both of the older theories. This lecture is a defence of Keynesian economics. It proceeds by the admittedly unchivalrous method of pointing out the faults of the two rivals. The issue at hand is what it has always been between Keynesian and conservative macroeconomics, whether the government is able or unable to control real income by macroeconomic interventions.

To organize our thoughts it is convenient to choose one exemplar of conservative macroeconomics. For that purpose I have chosen Sargent's model of the economy (Sargent, 1973).[1] I do wish to emphasize that the Sargent model is chosen because it is a typical representative of the New Classical Economics. Therefore the remarks here concerning the Sargent model in particular apply with equal force to the New Classical Economics in general. The Sargent model has three equations. The first is an IS curve. Keynesian economists and conservative economists agree, it appears, on the IS curve, at least to a first degree of approximation. The second equation is an LM curve. New Classical economists allow this LM curve to have a non-zero interest elasticity; the old-style conservative economists, who espouse the quantity theory, question the empirical significance of such an interest elasticity. With a significant income elasticity and a zero interest elasticity of the demand for money, fiscal policy can have no effect on money income regardless of the degree of slack in the economy. If not only the interest elasticity, but also the income elasticity, of the demand for money is low, however, fiscal policy can be effective in changing real income. The fault of the quantity theorists, I will argue in this lecture, is to dismiss the very reasonable possibility that fiscal policy works because the short-run income elasticity as well as the short-run interest elasticity is low. The first part of this lecture will discuss the theoretical and empirical merits of a short-run money demand function in which the income elasticity of demand is low.

The third equation of the Sargent model is the aggregate supply schedule. According to this equation the supply of goods (and implicitly of labour too) depends upon the gap between actual prices and expected prices. Actual prices (and wages) are determined in such a way that goods and labour markets clear. The greater is the excess of actual over expected prices, the greater will be aggregate supply, since unexpected price changes are mistakenly interpreted as relative price changes. Unemployment in excess of the natural rate can persist only so long as the time it takes market participants to formulate their expectations correctly. The second part of this lecture takes issue with this view on empirical grounds; for it is shown that most unemployment belongs to spells of

sufficient length that it cannot plausibly be accounted for by misinformation regarding prices. The third section of this lecture questions on theoretical grounds the assumption that, as long as expected and actual prices are equal, output is solely dependent on supply considerations. On the contrary, such invariance will not occur unless wages and prices serve to clear the labour and goods markets continuously. The third section of this lecture demonstrates why non-clearance of the labour market is a natural occurrence when aggregate demand is low. It is argued that notions of fairness and equity held by workers and firms (in addition to the standard supply and demand considerations) determine labour market outcomes. Moreover, the social customs associated with these notions of fairness, once established, may continue to be observed by utility-maximizing individuals even though markets are not clearing.

I. Keynesian Economics versus the Quantity Theory[2]

The problem

The classical economists apparently believed that the short-run nominal value of total transactions was proportional to the quantity of money. Irving Fisher (1911) was the most powerful exponent of this view. According to Fisher, if an inflow into a bank account is followed by an outflow with a constant average lag, total transactions would be proportional to the money supply (the proportion being inversely related to the lag). Since Fisher wrote before modern income theory, it is necessary to add another step to get a quantity theory of income, but that step is natural and easy. If there is a constant relation between total nominal transactions and nominal income, in turn there will be a constant relation between nominal income and the money supply. In order to write *The General Theory* (Keynes, 1936) and show that under certain conditions fiscal policy as well as monetary policy can affect aggregate income, it was necessary for Keynes to explain why the relation between money and income was not univalent, as asserted by the quantity theory. Keynes' explanation was that money is used not only for transactions purposes but also, potentially, held as an asset; if so, its demand will depend upon the rate of interest, and hence the relation between money and income is not univalent.

If money is defined narrowly, however, as currency plus demand deposits, and if positive interest rates are paid on time deposits, there is no reason why anyone would hold narrowly defined money as an asset. If the supply of money thus defined is fixed, then Irving Fisher's argument regarding the proportionality of M_1 and Y applies and Keynes' assertion regarding the effectiveness of fiscal policy is refuted. The Keynesian economists of the 1950s, Baumol (1952) and Tobin (1956), responded to this line of attack not by defending the speculative demand for money, but rather by proposing that the *transactions* demand for money would not be dependent only on income, as suggested by Irving Fisher and also by Keynes, but would also be dependent on the rate of interest; as interest rates rise the opportunity cost of holding money rises; and this rise, they argue, induces individuals to hold less money on the average for transactions purposes.

Keynes and Fisher had both quite clearly seen the potential dependence of the transactions demand for money on the interest rate. In *The Purchasing Power of Money* Fisher (1911) discusses the interest rate as one of the determinants of persons' *habits* of payment, and therefore, implicitly, as one of the determinants of

money holdings. But Fisher's use of the word "habits", and Keynes' similar dismissal of the importance of this dependence in the short run except under unusual circumstances, are indicative of their view that the transactions demand for money was potentially dependent on the interest rate only over the longer run in which "habits" might be variable.[3,4]

There was good reason for Keynes' and Fisher's scepticism regarding the speed of adjustment of the transactions demand to changes in the interest rate. The following calculation is typical. Consider a person who earns £10,000 per year. Let transactions costs be £1 per transaction. Suppose this person uses the Baumol formula to determine the optimum number of transactions between money and interest-bearing securities. If the interest rate changes from 5 to 6 per cent per annum, and he fails to adjust the number of his transactions to take advantage of the higher interest rates, he loses only 21 pence per annum. The small amount of this loss gives plausible reason why adjustment might be quite slow.

The dividing line between Keynesian and conservative macroeconomics, wrote Harry Johnson 15 years ago (Johnson, 1962, pp. 344–345) was an empirical one; it mainly concerned the empirical value of the interest elasticity of the demand for money. Many Keynesians would agree with Johnson's summary of the debate. What has generally gone unrecognized by Keynesians and quantity theorists alike is that fiscal policy may affect income in spite of a low interest elasticity of transactions demand, but for reasons that neither Fisher nor Keynes apparently recognized. Because the slope of the LM curve is $-L_Y/L_r$, even if L_r is low, a shift in the IS curve will significantly shift the income at which the two curves intersect if L_Y is also low (where the demand for money, nominal income and interest are denoted L, Y and r respectively, and $L = L(Y, r)$).

The conclusion that under reasonable assumptions concerning individual behaviour and habits there will prevail a constant ratio between transactions and money balances in the short run turns out to be considerably less robust than Keynes or Fisher might have suspected. I will describe several different modes of behaviour, each of which is no more arbitrary than Irving Fisher's constant lag of payments following receipts and all of which generate a short-run income elasticity of the transactions demand for money which is quite low. As long as "habits" are fixed, where "habits" are suitably defined in the context of each model, the short-run income elasticity of the demand for money, like the short-run interest elasticity, can be shown to be zero. In these models the demand for money is independent of income and interest as long as "habits" of payment are fixed; however, since the optimal habits depend on income and interest, the demand for money will shift as these habits also shift in response to changes in these variables. However, as the word "habits" implies, this adjustment to the optimum may occur with a lag, so that both the short-run income and interest elasticities will be low. As will be discussed below, the predictions of these fixed "habits" models with zero short-run income elasticity are consistent with the behaviour of velocity over the course of the business cycle, while Irving Fisher's model, with a short-run income elasticity of the demand for money of unity, is inconsistent with available empirical evidence.

To recapitulate, according to Irving Fisher's logic, if payments "habits" are fixed, the short-run income elasticity of the demand for money is unity; the short-run interest elasticity is zero. According to the models I will present, if "habits" of

payment are fixed, the short-run income and interest elasticities of the demand for money are low: these short-run elasticities depend not only upon the relation between the optimum habits and income and interest but also on the speed of adjustment of these habits towards that optimum; as a result, the slope of the short-run LM curve, L_Y/L_r, need not be very large even if the short-run value of L_r is low.

Models with "habits" which, if constant, yield a short-run zero income elasticity of the demand for money

The first of our models with payments "habits" divides the money-holding decision (as is implicit in Irving Fisher) into two separate decisions. Money holdings are affected by *autonomous* and *induced* payments into and out of persons' bank accounts. An *autonomous* payment is one that is independent both in timing and in amount of the level of money in persons' bank accounts. In contrast to *autonomous* payments, *induced* payments are those that are influenced in either timing or amount by the level of the bank account. According to Irving Fisher's "habit" an induced out payment follows an autonomous in payment with a constant average lag. In contrast, suppose that bank accounts are monitored by a threshold target policy, whereby, upon exceeding an upper threshold h, the account is returned by an induced out payment to a target z and upon falling below a lower threshold O it is also returned to the target z, by an induced in payment. The threshold h and the target z are pictured as being determined optimally in the long run to balance the costs of holding money relative to the benefits at given levels of income and interest.[5]

It is natural to inquire, parallelling the simplest quantity theory of Irving Fisher, how the demand for money will behave in the short run if "habits" of monitoring bank accounts are fixed, where such a fixed *habit* is not taken to be a constant threshold h and a constant target z. Let the probability distribution of a *non-zero* autonomous payment into or out of an individual's bank account in amount x at a moment dt be denoted $f(x)dt$, while the probability of no transaction at the moment dt is

$$1 - \int_{x \neq 0} f(x)\, dx\, dt.$$

Consider the steady-state probability distribution of money holdings determined by the distribution $f(x)$, the threshold h and the target z. It can be shown that, if the probabilities of making non-zero transactions change in equal proportion (i.e. if $f(x)$ is multiplied by the same scalar for all x), there will be no change whatsoever in the probability distribution of an individual's money holdings.

This passivity of velocity in response to an equiproportionate increase in the probabilities of all non-zero transactions has a simple explanation. The total expected additions to money holdings in any period are the sum of expected net autonomous payments and expected net induced payments. In equilibrium, with constant money supply, net desired autonomous payments and net induced payments must exactly balance. With constant threshold target monitoring an equiproportionate increase in the probabilities of non-zero autonomous payments produces an equiproportionate increase in the probabilities of non-zero induced payments. If, prior to the increase in the probabilities of autonomous payments, expected net autonomous and expected net induced payments exactly balance then subsequent to the increase the expected values of these two types of

payments will continue to balance. A cinematographic analogy makes this proposition clear. An equiproportionate increase in the probabilities of non-zero autonomous payments with threshold target monitoring acts in the same way as if a movie of the payments made in the whole economy were being projected at a proportionately faster speed. If, prior to the increase in probabilities, the net autonomous and the net induced payments exactly balance, then subsequent to the increase in the "speed of the movie projector" these two types of payments will continue to balance. No excess demand for money will result, provided, of course, that the targets and thresholds remain unchanged. For this reason velocity will be passive with constant targets and thresholds.

The preceding story has two difficulties, aside from the designation of a fixed "habit" as fixed targets and thresholds, but apparently neither of these two difficulties is intrinsic to the low income elasticity of the demand for money. The first difficulty lies in the assumption that the comparative static change in income causes an equiproportionate change in the probabilities of all transactions rather than, as would occur with a uniform increase in all prices, an equiproportionate increase in the amounts of all transactions with the probabilities of making transactions fixed. In this latter case, as it turns out, there is no presumption, as long as targets and thresholds are fixed, as to whether an equiproportionate increase in the amount of all transactions, with probabilities otherwise fixed, will increase or decrease the demand for money.[6]

The second difficulty concerns the serial independence of payments probabilities; it is unrealistic to assume that at *each* moment in time dt an individual has an equal probability $f(x)\,dt$ of an autonomous payment x. Some payments occur periodically, such as wage payments or the payments of bills, contrary to such an independence assumption. A second model, however, which incorporates periodic payments, demonstrates that, with fixed thresholds and targets, this periodicity makes relatively little difference to the conclusion of a low income elasticity of the demand for money, as shall be shown presently.[7]

Suppose an individual receives a monthly payment Y, of which an amount C is spent and an amount S is accumulated over the course of the month. Then, on the same day of each succeeding month, in the absence of an induced payment to reduce money holdings, the bank account will be higher by an amount S. The individual in question has a "habit" of reducing his money holdings to zero (for example, by transferring funds from his current account to his deposit account) when the bank account exceeds the threshold level h (which I assume to be greater than Y). The number of months between such transfers n is then given by the inequality.

$$C + nS \geqq h > C + (n-1)\,S.$$

As a result

$$n = \left[\frac{h-C}{S}\right]$$

where the square brackets enclosing $(h - C)/S$ indicate the smallest integer greater than $(h - C)/S$. Average money holdings will consist of the average level of expenditure over the course of the month, which is $C/2$ plus the average level of the holdings of the accumulation, which is $(n - 1)\,S/2$.

A quick calculation reveals that

$$M^d = C/2 + (n-1)\,S/2$$
$$\simeq C/2 + \left(\frac{h-C}{S} + \tfrac{1}{2} - 1\right) S/2$$
$$= h/2 - S/4$$

where $[(h-C)/S]$ is approximated by

$$\tfrac{1}{2}\{(h-C)/S + (h-C)/S + 1\}.$$

The result is an income elasticity of the demand for money that is just slightly negative, the derivative of M^d with respect to Y being $-(1/4)(\partial S/\partial Y)$. In this sense, the results of the preceding model generalize; if habits are of the threshold target variety and if "habits" are fixed in the short run, the short-run income elasticity of the demand for money will be quite small.

The "habit" of fixed targets and thresholds, however, is not the only one that yields a short-run zero income elasticity. A second type of payments "habit" (other than constant target threshold) that leads to a zero income elasticity concerns the timing of payments, and hypothesizes that persons adjust the timing of their payments, at least in the short run, to the quantity of money in their bank accounts, rather than, as Irving Fisher suggested, adjusting the quantity of money held to the volume of transactions, while keeping the timing of payments relative to these transactions fixed.

A simple model of such behaviour illustrates the difference between Irving Fisher's assumed behaviour and the behaviour of persons with this "payment deferment habit".[8] Suppose that persons' bills are proportional to income, as one might expect expenditures to be. Assume, for the sake of simplicity, that inflows are also proportional to income and, that, on the average, bills and income exactly match. (More complicated models analyse the situation in which bills and income fail to match.) Each person receives a constant inflow into his bank account and sits down once a month to pay his bills (on the λth day). If we were to follow Irving Fisher, we would assume that each person pays all the accumulated bills; on the λth day if there is insufficient money on hand to pay all the bills, Fisher would assume that he obtains the needed money from alternative sources (perhaps borrowing) in order to pay. But, in contrast, let us assume that if insufficient money is on hand to pay all bills on the monthly day of payment a person simply *delays* payment. The realism of such an assumption to anyone with a current account should be apparent. Furthermore, let us assume that the unpaid bills are paid off as soon as possible after the monthly date of payment λ.

An analogy, suggested by my colleague Ross Milbourne, shows why in this latter case the income elasticity of the demand for money will be zero. Consider a group of friendly gamblers who play a weekly poker game. Each player decides each week how much money to bring to the game. At some point, however, during one of the weekly games, the stakes are increased. A quantity-theoretic story would have each player recruit money from alternative sources after the stakes are raised, and if insufficient money is available the players will go home early. According to the parable of our model, the initial (i.e. the short-run) response to the increase in stakes is that the winners will give credit to the losers and the game will continue otherwise unaltered by the limits imposed by the amount of money

brought to the game. Of course, if the stakes are increased permanently, after some interval of time, the money brought to the game will increase proportionately with the stakes, but this will be a long-run rather than a short-run response.

In addition to constant targets and thresholds and the endogenous timing of payments, there is a third reason as to why the income elasticity of the demand for money may be quite low in the short run. Persons may adjust not only the timing of their payments but also the timing of their purchases according to their money holdings. Even in the context of a model of complete optimization, this additional dimension of the money-holding decision gives a low income elasticity of the demand for money.[9]

Relation between theory and evidence

There is one main advantage of a theory of the demand for money with a low short-run income elasticity—namely, it is consistent with the observed procyclical behaviour of velocity over the course of the business cycle (Friedman, 1959). Indeed, most good estimates of the demand for money are based on a stock adjustment model in which the demand for money adjusts with a lag to a desired stock.[10] A rise in income in such models causes an increase in velocity until this adjustment is complete. Such a functional form for money demand is inconsistent with an alternative hypothesis which is closer to Irving Fisher's theory; according to the alternative hypothesis *velocity* (rather than money demanded) adjusts with a lag as income and interest change. Hence income velocity in the short-run will be roughly constant following an increase in income. This is inconsistent with the observed procyclical behaviour of velocity over the course of the business cycle.

II. Aggregate Supply

Introduction

While the old classical economics bases its case against the efficacy of fiscal policy on the low interest elasticity of money demand, the New Classical Economics argues that no anticipated government policy—neither monetary nor fiscal policy—can affect real output. This conclusion follows not from any special assumptions concerning money demand, but rather from the assumptions, first, that aggregate supply depends only on unanticipated price changes; second, that expectations are formed rationally; and third, that prices and wages adjust to clear product and labour markets. Sargent's aggregate supply equation (1973, p. 434) is of the form

$$y_t = k_t + \gamma(p_t - {}_tp^*_{t-1}) + u_t \qquad \gamma > 0$$

where y_t is *per capita* income, k_t is the capital stock measured in units of capacity output, p_t is the actual price level, ${}_tp^*_{t-1}$ is the price level that persons expect at time $t-1$ to prevail at time t, and u_t is an error term. According to Sargent's explanation, this equation reflects the deviation of output from normal capacity production. "Unexpected rises in the price level ... boost aggregate supply, because suppliers [of which suppliers of labour are one important example] mistakenly interpret surprise increases in the aggregate price level as increases in the relative prices of the labor or goods which they are supplying" (Sargent, 1973, p. 738). The relevance of this equation depends upon the validity of two contentions. First, persons who are unemployed, according to this view, are misinformed about

the real wage being offered and are therefore holding our for more. Conservative economists have argued that such an interpretation is consistent with the short durations of unemployment spells in the United States, i.e. that these durations are sufficiently short on average for it to be quite reasonable to view unemployed persons for the most part as spending time discovering their market possibilities. In this section of the lecture I shall argue that the statistics on which such a "short" view of unemployment is based are quite misleading.

Second, Sargent's aggregate supply equation suggests that, as long as price expectations are correct, aggregate supply will be at its normal capacity level. Moreover, in the complete Sargent model, which gives the economic underpinning for his supply equation, prices and wages are treated as endogenous so that aggregate demand and aggregate supply are continuously equated. In the following section I will propose reasons why wage and price inflexibility may prevent market clearance so that unemployment may prevail even if the price expectations of market participants prove to be correct. The novelty of the model described there rests not on its suggestion that markets may not clear—a view that is widely held by Keynesians—but rather in its demonstration that non-market clearance can be compatible in equilibrium with maximizing behaviour on the part of all market participants.

Duration of unemployment[11]

There is a "new view" of labour markets generally and of unemployment in particular that seems to lend support to the Sargent equation of aggregate supply. This "new view" claims that most unemployment consists of flows of persons who are unemployed for short periods rather than stocks of persons who are unemployed for long periods.[12,13,14] If unemployment spells are quite long, the New Classical Macroeconomics seems implausible in explaining changes in aggregate unemployment. According to the New Classical Macroeconomics, at times of high unemployment persons who are unemployed withhold their labour from the market because they are misinformed about average wages and prices. Such persistent misinformation on the part of labour market participants is plausible only if most unemployment consists of spells of short duration. (Of course the converse is not true; much unemployment could be of short duration, as Feldstein asserts, for reasons other than misinformation.)

Three statistics

I shall describe three statistics on the average duration of unemployment. The first of these is the average duration of *interrupted* spells.[15] This is the officially reported statistic on the average duration of unemployment in Britain and America, and it is compiled by recording how long the currently unemployed have been out of work. It is called *interrupted* because the spell is examined prior to its completion. There is an exact analogy between *ages* of a population and *durations* of unemployment.[16] According to this analogy the beginning of a spell of unemployment corresponds to the date of birth, and the average *duration of interrupted spells* of unemployment corresponds to the average *age* of a population. Unless the different concepts of unemployment duration are well understood, the statistics on unemployment duration can be quite misleading. Demographers interested in how long persons live typically look at statistics concerning age at death. Similarly, to get an idea of how long unemployment lasts,

one should look at the length of *completed* spells, not at the length of *interrupted* spells. Feldstein, in his now famous paper (Feldstein, 1973), which first employed the phrase "the new view", only used statistics on the durations of interrupted spells.[17]

The second and third statistics to be discussed concern the average length of *completed* spells, in contrast to the average length of *interrupted* spells. The second statistic is the average completed duration of the spells of the *currently unemployed population.* This statistic is analogous to the average age at death of the current population. In a steady state (in which both the probabilities of exit from unemployment as a function of time spent looking for work and the flows of workers into unemployment are constant) there is a simple relation between the average lengths of completed and interrupted spells of the currently unemployed population; this relation allows us to estimate the length of completed spells from the officially reported statistics, which concern only interrupted spells. On average, in a steady state a person is sampled one-half way through his completed spell.[18] Thus the expected length of an unemployed worker's completed spell is exactly double the duration of his interrupted spell. As a result, the average duration for all unemployed persons of their completed spells is approximately double the average duration of their interrupted spells.

There is a third natural statistic on durations of unemployment. This is the average completed duration not of the spells of persons unemployed at a given moment but of all spells of unemployment over a given period of time. This statistic, or its inverse, which is the rate of turnover of the unemployed pool, has been influential in the "new view". Perry's "Unemployment Flows in the US Labor Market" (Perry, 1972) analyses this statistic at considerable length. Hall explains the "new view" as one in which labour markets are viewed as having rapid turnover (Hall, 1972). And Feldstein, who uses data on interrupted spells to show that unemployment is short, cites the high rates of turnover in manufacturing as evidence that job tenures are short (Feldstein, 1973, pp. 11–12).

Our second statistic, which is the average duration of completed spells of the currently unemployed population, and our third statistic, which is the average duration of all spells of unemployment over some period of time, differ empirically by something close to an order of magnitude. Table 1 gives estimates of these two statistics for the United States for the years 1948–1977. The average duration of all completed spells is approximately 25 per cent of the average duration of the completed spells of the unemployed population.

The large difference between the two columns in Table 1 can be simply explained. The probability of a person being sampled from the population of currently unemployed is proportional to the length of his unemployment. In a steady state the two statistics are related in the following way. The average completed duration of spells of persons currently unemployed is the weighted average of the durations of all completed spells, with each spell weighted by its respective length. In terms of the population analogy, the duration of all completed spells corresponds to *average life expectancy* at birth; the average duration of completed spells of the unemployed population corresponds to the *average date of death of the current population.* The former statistic is lower than the latter; the child who dies at 10 will be sampled by only one decennial census; the man who lives to 80 will be sampled by eight decennial censuses.

The "new view" has correctly pointed out that most spells of unemployment

TABLE 1

WEIGHTED AND UNWEIGHTED UNEMPLOYMENT DURATIONS IN THE US

	Average duration of completed spells of unemployment (weeks) (1)	Estimate of completed duration of spells of persons currently unemployed (weeks) (2)	Unemployment rate (%) (3)
1948	4·6	17·2	3·8
1949	6·2	20·0	5·9
1950	6·7	24·2	5·3
1951	4·1	19·4	3·3
1952	4·0	16·8	3·0
1953	3·7	16·0	2·9
1954	6·4	23·6	5·5
1955	5·4	26·0	4·4
1956	5·0	22·6	4·1
1957	5·7	21·0	4·3
1958	7·4	27·8	6·8
1959	6·2	28·8	5·5
1960	6·0	25·6	5·5
1961	7·2	31·2	6·7
1962	6·2	29·4	5·5
1963	6·4	28·0	5·7
1964	5·8	26·6	5·2
1965	5·2	23·6	4·5
1966	4·2	20·8	3·8
1967	5·0	17·6	3·8
1968	4·5	16·8	3·6
1969	4·6	15·8	3·5
1970	5·4	17·4	4·9
1971	NA	22·6	5·9
1972	6·2	24·0	5·6
1973	7·0	20·0	4·9
1974	5·6	19·4	5·6
1975	9·1	28·2	8·5
1976	8·0	31·6	7·7
1977	7·2	28·6	7·0

Source: Kaitz (1970) and Akerlof and Main (1978a).

are fairly short. It has, however, failed to point out that most unemployed persons are unemployed for rather long periods. Over the postwar period the average spell of unemployment in the United States has been only about six weeks. On the other hand, persons who were currently unemployed at any time over the postwar period in the United States were unemployed (in the sense of the duration of their completed spells) for an average period of close to six months.[19]

While column (1) of Table 1 is roughly consistent with the Sargent model, it stretches the imagination to believe that column (2) is also consistent. According to column (1), most persons who begin a spell of unemployment leave that state quickly. On the other hand, in every year of the postwar period a non-negligible fraction of the labour force has been unemployed in the United States. The average length of time out of work for such persons during the postwar period, as already mentioned, has been close to six months. In 1976 this figure was close to eight months, with 7·7 per cent of the labour force unemployed. It defies credi-

bility to assert that a sizeable fraction of this 7·7 per cent of the labour force was withdrawing its services from the labour market for a period of eight months on average because they were unaware of the true state of average wages and prices. A much simpler explanation is provided by the standard Keynesian model. According to that theory, most unemployment occurs because labour markets fail to clear. The theoretical consistency of this point of view, which has been challenged by the New Conservative Macroeconomists, will be discussed in Section III.

Two additional comments on unemployment durations

There are at least two additional reasons why unemployment duration statistics understate the severity of persons' adverse labour market experience. First, there are many persons who, even over a short period (a calendar year, for example), suffer from *multiple* spells of unemployment. For them, the duration of a *completed* spell understates their total unemployment experience. Brian Main and I (Akerlof and Main, 1978a) have found that persons with repeated spells of unemployment have suffered only slightly more unemployment in total than persons with single spells of unemployment because the average duration of single spells of unemployment is significantly greater than the average duration of all spells. The average duration of unemployment of persons with single spells is approximately 50 per cent longer than the average duration of all spells. This greater length of single spells than of repeat spells is an empirical regularity which appears to hold for all segments of the labour force and in particular for prime-age men (for whom we have greatest confidence in the accuracy of their reporting because of the fairly close correspondence between their retrospective reports of unemployment experience and the unemployment recorded by month-to-month surveys).

Furthermore, as has been pointed out in the excellent recent paper by Clark and Summers (1978), the impact of bad labour market conditions on individuals may not end with a spell of unemployment. On the one hand, workers may take temporary short-term jobs; or, on the other hand they may drop out of the labour force. Both because of repeat spells and because reported periods of unemployment may not truly encompass the periods of poor labour market conditions, the durations of even weighted spells of unemployment underestimate the durations of times of poor labour market conditions.

The "new view" of employment and job tenures

There is a "new view" regarding not only unemployment, but also employment. According to this "new view", not only unemployment, but also employment is of short duration; the short duration of the average job is revealed by rapid rates of turnover (see Feldstein, 1973, p. 12). Statistics that are collected monthly for the United States show a rate of turnover in manufacturing between 3·9 and 5·0 per cent per month, which would make the average length of a manufacturing job between 20 and 26 months. But the identical considerations regarding the length of spells of unemployment also pertain to employment tenures. While the average length of a job is quite short, persons, on average, hold jobs of quite long duration. The exact same theorems apply to job tenures that were earlier applied to unemployment durations. Therefore it is possible to use statistics on the tenure of current jobs to estimate the completed length of the

current job of current job-holders (which is roughly the same as the weighted durations of job tenures). The ratios of the weighted and the unweighted job tenures are similar to the ratios of the weighted and unweighted unemployment durations. Special surveys were taken of job tenure in the United States for the years 1966, 1968 and 1973. In these years median current job tenures of males were 5·2, 4·8 and 4·6 years respectively. For women, however, median current job lengths were quite short, being 2·8, 2·4 and 2·8 years respectively.[20] The steady-state assumption is undoubtedly less realistic with respect to job tenures than with respect to unemployment durations averaged over a period of one year; nevertheless, these numbers give an estimate of nine to ten years as the median length of time men will hold their current jobs, and five to six years as the median length for women.

III. Social Custom Regarding Wages and Unemployment as Non-market Clearance[21]

The problem

According to Sargent's equation of aggregate supply, if actual and expected prices are identical, aggregate output will be determined solely by supply considerations, and the rate of unemployment will be the so-called natural rate. In fact, regardless of expectations, the labour market, according to the "new view", is always assumed to clear, in the sense that any worker willing to supply his labour at the prevailing market wage can succeed in obtaining employment. Such an interpretation, however, amounts to dismissal of a standard Keynesian interpretation of unemployment—namely, that unemployment is involuntary in the sense that the labour market does not clear. This disequilibrium view of unemployment has been elaborated perhaps most convincingly by Barro and Grossman (1971). In their now-classic paper they analyse how markets would behave if wages and prices are fixed arbitrarily, so that neither the goods market nor the labour market necessarily clears. They explain how equilibrium in the economy will be achieved by utility-maximizing agents if, for reasons that are left unspecified, wages and prices are fixed. In this sense the Barro–Grossman contribution is the reconciliation of Keynesian analysis with utility and profit maximization. With prices and wages set so that the supply of labour exceeds the demand for labour and the supply of goods exceeds the demand for goods, the Barro–Grossman model corresponds exactly to the standard "Keynesian-cross" model of elementary textbooks and generates an equilibrium with involuntary unemployment and with output constrained below its full employment level by inadequate demand.

The Barro–Grossman model, its merits notwithstanding, makes strong assumptions which its authors are unable to defend adequately: The model assumes, but fails to explain, why wages and prices are not set at their market-clearing levels. Apparently, both authors are now dissatisfied with their work because of this shortcoming. Barro has gone on to become one of the leading New Conservative macroeconomists; Grossman (1979) has recently worked on implicit contract theory explanations of sticky money wages.[22] There are, however, good reasons inherent in the organization of large- and medium-scale business why, at least in a cyclical trough, wages should be fixed above the market-clearing wage. Furthermore, empirically, such non-market clearance is

consistent with the observed high rates of unemployment that occur at such times and also with the long average durations of unemployment, which I discussed in Section II above.

To understand why wages are unlikely to achieve their market-clearing levels during cyclical downturns it is useful to review for a moment the firms' opportunities, which are implicit in the classical model. Consider a firm that is paying its labour more than the market-clearing wage. According to the market-clearing model the firm can and will pay new hires no more than the market-clearing wage. In addition, because it can lay off its existing work force and employ a totally new one at the market-clearing wage, the firm can and will use this threat to force its existing workers to accept a wage reduction.

Fairness and maximizing equilibrium

To the non-economist, to whom notions of fair treatment take precedence over notions of market clearance, it may appear obvious why a firm would not behave in such a fashion. However, Sargent's model, or indeed any model that assumes that wages adjust to clear the labour market continuously, assumes implicitly that behaviour of this sort occurs routinely in the labour market. As a result, the argument against the assumption of market clearance can best be made by outlining some of the reasons why a profit-maximizing firm will not necessarily try to take advantage of a short-run opportuntity to cut wages or, correspondingly, why utility-maximizing employees are not obliged to accept the short-run market-clearing wage.

All firms of any size have established rules and procedures regarding the appropriate treatment of workers, and these rules and procedures include systems of wage and salary payments. Since there must be considerable correspondence between what is taught in courses on personnel management and actual corporate practice, textbooks on personnel management are revealing as to the actual nature of standard corporate practice. For example, one leading textbook on personnel management introduces its chapter on wage and salary management as a discussion of "the administration of *systematic* wage and salary *policies*" (italics added) (McFarland, 1968, p. 587). That chapter (pp. 587–615) makes quite clear that these policies are far less mechanistic than merely paying the market-clearing wage. On the contrary, most of the chapter concerns the relation between remuneration policy and the morale of the work force.

Remuneration policies of corporations are, in fact, merely parts of elaborate codes of behaviour regarding the reciprocal relations between firms and their workers. These codes of behaviour define in most circumstances the proper behaviour of the firm towards its workers, of which remuneration policy is one factor, as well as the proper behaviour of the workers towards the firm. These codes of behaviour are often written quite formally into job descriptions, wage scales, grievance procedures, etc.; but, in addition to the written code, invariably there exists an unwritten code as well. (For example, professors are expected to participate "voluntarily" on administrative committees.)

Firms will, by and large, conform to such codes of "standard practice" for much the same reasons that individuals will, almost always, conform to prevailing social custom in their societies. These standard business practices, if the texts on personnel management can be taken as a useful description of labour market policy, normally prohibit firms and industries from paying the market-clearing

wage at all times and in all places. For the same reasons that utility-maximizing individuals usually follow the social customs of their societies, profit-maximizing firms find it profitable to follow standard business practice. If standard business practice prohibits paying market-clearing wages, profit maximization will be inconsistent with wages that are market-clearing. Thus, the standard non-market-clearing Keynesian model will be consistent with profit maximization, and the market-clearing New Conservative Macroeconomics will be inconsistent with profit maximization. I will demonstrate here why the firm which tries, contrary to the standard practice, to behave in the manner suggested by the market-clearing model will not in general maximize its profits.

According to American business practice, it is not permissible to pay unequal wages for unequal work by bringing in new employees at lower wages than are paid existing employees for the same work; to reduce the wages of the existing work force is considered taking advantage of their weakened market position. The existing workers in the firm will, if they feel that the firm is acting contrary to standard practice, reduce their productivity for two reasons: first, many who believe that the standard practice is morally correct will be unwilling to cooperate with a firm that violates that practice; second, those workers who do not themselves believe in the "immorality" of the practice will fear the loss of reputation that is likely to result from not supporting their fellow workers. While the firm could conceivably lay off its whole work force and replace it totally, the low output of a whole new work force without the cooperation of its experienced workers in training makes such massive layoffs almost always impracticable, as demonstrated by the low productivity in the rare cases where such massive replacement has occurred (e.g. Harlan County, Kentucky, and in the Kohler strike). As a result, the firm has an incentive to follow what is commonly believed to be standard practice; workers, whether they believe in the practice or not, also have similar incentives. Hence, once a particular policy is almost universally believed to be standard practice, it will be observed. And in turn this observance will reinforce its status as standard practice. For that reason, there is an equilibrium in which the practice will be followed. The preceding description regarding the observance of "standard business practice" corresponds almost exactly to the reasons why most social customs are followed. Furthermore, the preceding logic explains why a whole range of social customs (or standard business practices) may, once established, be followed in equilibrium. This multiplicity of equilibria is consistent with the most famous adage regarding social customs, "When in Rome, do as the Romans do".

Of course the logic of the preceding paragraph can be taken too far. A social custom, or a standard business practice, will be violated if it is too costly to obey. Such disobedience will itself tend to undermine belief in the values that uphold the custom. But there may still be a whole range of standard business practices that are not too costly to be observed in equilibrium and that are upheld because disobedience of them is, by some party or other, held to be undesirable. Perhaps as a result only of historical coincidence, the American firm tends to uphold wages in recession and lay off workers while the Japanese firm tends to reduce wages but retain its workers. The opposite behaviour in either country would be considered contrary to the business code of behaviour. Workers who are adversely affected by such opposite behaviour could in all likelihood enlist the support of other

workers to protect themselves against such "unethical" actions on the part of the firm.

To summarize, and recapitulate, while wage policy cannot totally disregard markets, because some wage policies would be too costly for the firm to pursue, there is nevertheless a range of possible standard business practices, that, once expected to be followed and considered to be ethically correct, will prove themselves too costly to violate. Not only may it be costly for the firm to violate such standards, but it may also be personally unrewarding for workers to cooperate with such violations. If writings on personnel management can be taken as evidence for the way in which firms actually behave, then standard business practice, while paying some attention to labour market conditions, does not allow the payment of the market-clearing wage at all times and in all circumstances. And if the government can affect real aggregate demand, as it can in the standard Keynesian model, so too it will affect the level of equilibrium output.

Additional remarks

Let me add three final remarks before summarizing the whole lecture. First not all firms are so large that they have wage and salary policies. There is also a sizeable "secondary" labour market. As Hall (1975) has pointed out, many of the unemployed have explicitly or implicitly rejected jobs in this small-scale market. The truth of this observation, however, also coincides with the view expressed in the last section that the duration of time elapsed between "normal" jobs is longer than the durations of single spells because some persons, on losing their "normal" jobs, take jobs of short duration in the secondary sector. Second, a "normal" job is, at least for most adult males, a well-defined term because most adult males spend most of their working lives in jobs of considerable length, even though, at the same time, labour turnover may be very high. Finally, of course, if there is rationing in one sector of the labour market (the primary sector, as Hall has alleged) and the unemployed are those who are unwilling to take the unrationed jobs in the secondary sector, the New Classical Macroeconomics is still invalid because actual output supplied will depend on the real demand for the output of the job-rationed sector.

IV. Summary

In summary, the old conservative macroeconomics has been challenged because there are empirical and theoretical reasons for believing that the short-run income and interest elasticities of the demand for money are of the same order of magnitude, contrary to the usual rationale for the constancy of velocity in the short-run. The New Conservative Macroeconomics has been challenged, first, on its interpretation of statistics, which show rapid rates of turnover; such statistics are consistent with most persons currently unemployed being in unemployment spells of long duration. Such long durations question the New Conservative view that unemployment can be blamed on aberrations of supply owing to misinformation regarding real wages. They are consistent, however, with the standard Keynesian interpretation of unemployment, in which jobs are rationed. Furthermore, such job rationing is also consistent with utility maximization on the part of all agents, who are either undesirous or fearful of disobeying standard business practice or of supporting such disobedience.

ACKNOWLEDGMENTS

This inaugural lecture was given at the London School of Economics and Political Science on February 26, 1979.

I would like to thank Professor Ross D. Milbourne of Queens University, Canada, and Dr Brian G. M. Main of the University of Edinburgh for permitting me to make use of jointly authored papers and work currently in progress in Sections I and II of this paper, respectively.

I would also like to thank Janet L. Yellen for invaluable comments on the present draft of this paper, the National Science Foundation for financial support under research grant numbers SOC 75-23076 and SOC 77-04093, and the US Department of Labor for support under Small Grant Number 91-06-78-27. I, of course, retain responsibility for the point of view and all errors.

NOTES

[1] For other early work with rational expectations in macroeconomic models, see Lucas (1972, 1973), and Lucas and Rapping (1969). Papers by Phelps (1968) and Friedman (1968) placed Wicksellian natural rate theory in the context of modern macroeconomics. For important criticisms see Fischer (1977), Gray (1978) and Tobin (1979).

[2] This section summarizes Akerlof (1979a) and Akerlof and Milbourne (1978a, b, c).

[3] Fisher makes a list of the determinants of velocity. This list includes: "the habits of the individual (as to thrift and hoarding, as to book credit [and] as to the use of checks), the systems of payments of the community (as to the frequency of receipts and disbursements, as to the regularity of receipts and disbursements, [and] as to the correspondence between times and amounts of receipts and disbursements) and general causes (such as density of population [and] rapidity of transportation" (Fisher, 1911, p. 79). There is no evidence that Fisher considered any of these factors variable in the short run.

[4] Keynes' "dismissal" of the importance of the interest elasticity of transactions demand can be found in two passages of *The General Theory*:

> Let the amount of cash held to satisfy the transactions motive and precautionary motive be M_1, and the amount held to satisfy the speculative motive be M_2. Corresponding to these two components of cash, we then have two liquidity functions L_1 and L_2. L_1 mainly depends on the level of income, whilst L_2 mainly depends on the relation between the current rate of interest and the state of expectation . . . [Keynes, 1936, pp. 199–200]

He further writes:

> It is not always made clear whether the income-velocity of money is defined as the ratio of Y to M or the ratio of Y to M_1. I propose, however, to take it in the latter sense. Thus if V is the income-velocity of money $L_1(Y) = Y/V = M_1$. There is, of course, no reason for supposing that V is constant. Its value will depend on the character of bank and industrial organisation, on social habits, and on the effective cost of holding idle cash. Nevertheless, if we have a short period of time in view and can safely assume no material change in any of these factors, we can treat V as nearly enough constant. [Keynes, 1936, p. 201]

Note that by the absence of the rate of interest as an argument of L_1 that Keynes did assume a lack of such "material change".

[5] This model is adapted from Miller and Orr (1966). They let the threshold and target adjust optimally to income and interest. Details of this model are given in Akerlof (1979b).

[6] For details see Akerlof (1979b).

[7] For details see Akerlof and Milbourne (1978c).

[8] For details see Akerlof and Milbourne (1978b).

[9] For more detail see Akerlof and Milbourne (1978a). This is a summary of work that is currently in progress.

[10] See, for example, Goldfeld (1973), Laidler (1966), Chow (1966) and many others.

[11] The remainder of Section II summarizes the joint work of Akerlof and Main (1978a,b). This work is currently in progress.

[12] Hall expresses his view on pp. 709–711 of "Turnover in the Labor Force" (Hall, 1972). Here and there he gives the impression that he sees turnover as being quite rapid. For example: "The continual process of turnover seems to be the characteristic of the modern American economy that distinguishes it from those of other developed countries, where the experience of individual workers appears to be much more stable over time" (Hall, 1972, p. 709). The statistics he derives, the probabilities of moving from employment to unemployment and vice-versa, are rates of turnover.

[13] The new view according to Feldstein (1973) has been stated as follows:

> It is difficult to replace our old notions about demand determined unemployment by this new view. Let me therefore describe in more detail some of the characteristics of American unemployment during the past decade. I will begin with the experience of the total labor force and then consider differences among demographic groups.
>
> First, the duration of unemployment is quite short. Even in a year like 1971 with a very high unemployment rate, 45 per cent of those unemployed had been out of work for less than 5 weeks. In 1969, this proportion was 58 per cent. Similarly, very few are without jobs for as long as 27 weeks; in 1969, this was 4·7 per cent and in 1971 it was 10·4 per cent.
>
> Second, job losses account for less than half of total unemployment. In 1971, only 46 per cent of the unemployed had lost their previous jobs. In the more favorable market conditions of 1969, this proportion was only 36 per cent. The remainder are those who voluntarily left their last jobs, are re-entering the labor force or never worked before. In 1969, with an overall unemployment rate of 3·5 per cent, job loss contributed only 1·2 per cent.
>
> Third, the turnover of jobs is extremely high. Data collected from manufacturing establishments show that total accessions and separations have each exceeded 4 per cent of the labor force per month since 1960. Moreover, the number of quits has consistently exceeded layoffs during the past 5 years. Even with the high unemployment of 1971, more workers quit manufacturing jobs than were laid off. Many layoffs are both temporary and brief; in 1971, firms were rehiring about 85 per cent of the workers they had previously laid off. [Feldstein, 1973, pp. 11–12]

[14] A third statement of the "new view" is given by Perry (1972). This lecture shows why the average length of a completed spell of unemployment, which is a statistic used by Perry, can be misleading.

[15] For an excellent summary of the relation between different durations statistics, see Salant (1977).

[16] See Salant (1977) and Keyfitz (1977) for this analogy.

[17] Feldstein was aware of the difference between interrupted and completed spells. Thus he writes in a footnote (Feldstein, 1973, p. 39): "There are several problems in interpreting this number [the average duration of unemployment in the postwar period of about three months] . . .. The shape of the distribution of unemployment durations implies that this is close to, but not exactly equal to, the mean length of completed spells of unemployment" (Feldstein, 1973, p. 39). He is apparently referring to our third statistic, but not our second statistic.

[18] See Salant (1977) for proof that on average a person is sampled halfway through his completed spell.

[19] The first to point out that the length of all completed spells might be quite short while most unemployment might be spent in spells that were quite long were Clark and Summers in their seminal paper, "Labor Force Transitions and Unemployment" (Clark and Summers, 1978).

[20] Source: US Department of Labor (1967, 1969, 1975, Table A).

[21] This section summarizes Akerlof (1979a). Other authors who have emphasized fairness are Doeringer and Piore (1971), Hicks (1974), Okun (1975), and Williamson, Wachter and Harris (1975). Another author who has emphasized the importance of "commitment" for economic theory is Sen (1977).

[22] Akerlof and Miyazaki (1978) also show the difficulties in explaining unemployment by implicit contract theory.

REFERENCES

AKERLOF, G. A. (1979a). The economics of social customs, of which unemployment may be one consequence. *Quarterly Journal of Economics*, forthcoming.

—— (1979b). Irving Fisher on his head: the consequences of constant target-threshold monitoring of money holdings. *Quarterly Journal of Economics*, forthcoming.

—— and MAIN, B. G. M. (1978a). Unemployment spells and unemployment experience. Working Paper 123, Special Studies Section, Board of Governors of the Federal Reserve Board (September).

—— (1978b). Labor market states and labor market experience. Research Proposal, Institute of Business and Economic Research, Berkeley, California (December).

—— and MILBOURNE, R. D. (1978a). A payments flows approach to the demand for money: the consequences of the timing of payments and purchases for the demand for money. National Science Foundation Research Proposal, Institute of Business and Economic Research, Berkeley, California (September).

—— (1978b). Irving Fisher on his head (II): The consequences of the timing of payments for the demand for money. Working Paper 122, Special Studies Section, Board of Governors of the Federal Reserve System (September).

—— (1978c) The short-run demand for money. Mimeographed Working Paper (October).

—— and MIYAZAKI, H. (1978). The implicit contract theory of unemployment meets the wage bill argument. *Review of Economic Studies*, forthcoming.

BARRO, R. J. and GROSSMAN, H. I. (1971). A general disequilibrium model of income and employment. *American Economic Review*, **61,** 545–556.

BAUMOL, W. J. (1952). The transactions demand for cash—an inventory theoretic approach. *Quarterly Journal of Economics*, **66,** 545–556.

CHOW, G. C. (1966). On the long-run and short-run demand for money. *Journal of Political Economy*, **74,** 111–131.

CLARK, K.B. and SUMMERS, L.H. (1978). Labor force transitions and unemployment. National Bureau of Economic Research Working Paper, Cambridge, Mass. (August).

DOERINGER, P. B. and PIORE, M. J. (1971). *Internal Labor Markets and Manpower Analysis.* Lexington Mass: D.C. Heath & Co.

FELDSTEIN, M.S. (1973). *Lowering the Permanent Rate of Unemployment*, US Congress, Joint Economic Committee. Washington, DC: US Government Printing Office.

FISCHER, S. (1977). Long-term contracts, rational expectations and the optimal money supply rule. *Journal of Political Economy*, **85,** 191–205.

FISHER, I. (1911). *The Purchasing Power of Money.* New York: Macmillan.

FRIEDMAN, M. (1959). The demand for money: some theoretical and empirical results. *Journal of Political Economy*, **67,** 327–351.

—— (1968). The role of monetary policy. *American Economic Review*, **58,** 1–17.

GOLDFELD, S. M. (1973). The demand for money revisited. *Brookings Papers on Economic Activity*, **3,** 577–638.

GRAY, J. A. (1978). On indexation and contract length. *Journal of Political Economy*, **86,** 1–18.

GROSSMAN, H. I. (1979). Why does aggregate employment fluctuate? *American Economic Review Papers and Proceedings*, **69.**

HALL, R. E. (1972). Turnover in the labor force. *Brookings Papers on Economic Activity*, **3,** 709–756.

—— (1975). The rigidity of wages and the persistence of unemployment. *Brookings Papers on Economic Activity*, **3,** 301–349.

HICKS, J. R. (1974). *The Crisis in Keynesian Economics.* Yrjo Jahnsson Lectures. Oxford. Basil Blackwell.

JOHNSON, H. G. (1962). Monetary theory and policy. *American Economic Review*, **52,** 335–84.

KAITZ, H. (1970). Analyzing the Length of Spells of Unemployment. *Monthly Labor Review*, **15,** 11–20.

KEYFITZ, N. W. (1977). *Applied Mathematical Demography.* New York: John Wiley.

KEYNES, J. M. (1936). *The General Theory of Employment, Interest and Money.* New York: Macmillan.

LAIDLER, D. (1966). The rate of interest and the demand for money: some empirical evidence. *Journal of Political Economy*, **74,** 543–555.

LUCAS, R. E., JR. (1972). Econometric testing of the natural rate hypothesis. In *The Econometrics of Price Determination Conference* (Otto Eckstein, ed.). Sponsored by the Board of Governors of the Federal Reserve System and the Social Science Research Council. Reserve Board, Washington, DC: Federal Reserve Board.

—— (1973). Expectations and the neutrality of money. *Journal of Economic Theory*, **4,** 103–124.

—— and RAPPING, L. A. (1969). Real wages, employment and inflation. *Journal of Political Economy*, **77,** 721–754.

MCFARLAND, D. E. (1968). *Personnel Management: Theory and Practice.* New York: Macmillan.

MILLER, M. H., and ORR, D. (1966). A model of the demand for money by firms. *Quarterly Journal of Economics*, **80,** 413–435.

OKUN, A. (1975). Inflation: its mechanics and its welfare costs. *Brookings Papers on Economic Activity*, **2,** 351–390.

PERRY, G. (1972). Unemployment flows in the U.S. labor market. *Brookings Papers on Economic Activity*, **2,** 245–292.

PHELPS, E. S. (1968). Money–wage dynamics and labor market equilibrium. *Journal of Political Economy*, **76,** 678–711.

SALANT, S. W. (1977). Search theory and duration data: a theory of sorts. *Quarterly Journal of Economics*, **91,** 39–58.

SARGENT, T. J. (1973). Rational expectations, the real rate of interest and the natural rate of unemployment. *Brookings Papers on Economic Activity*, **2,** 429–480.

SEN, A. K. (1977). Rational fools: a critique of the behavioural foundations of economic theory. *Philosophy and Public Affairs*, **6,** 317–344.

TOBIN, J. (1956). The interest elasticity of the transactions demand for cash. *Review of Economics and Statistics*, **38,** 241–247.

—— (1979). Yrjo Jahnsson Lectures 1978, Oxford, forthcoming.

U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS (1967). *Special Labor Force Report 77: Job Tenure of Workers, January 1966*. Washington, D.C.: US Government Printing Office.

—— (1969). *Special Labor Force Report 112: Job Tenure of Workers, January 1968*. Washington, DC: US Government Printing Office.

—— (1975). *Special Labor Force Report 172: Job Tenure of Workers, January 1973*. Washington, DC: US Government Printing Office.

—— (1977). *Employment and Earnings*, **24**.

WILLIAMSON, O. E., WACHTER, M. L., and HARRIS, J. E. (1975). Understanding the employment relation: the analysis of idiosyncratic exchange. *Bell Journal of Economics*, **6,** 250–278.