

YRJÖ JAHNSSON LECTURES

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Asset Accumulation and Economic Activity

Reflections on
Contemporary Macroeconomic Theory

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Preface

I had the honor to give the Yrjö Jahnsson Lectures in Helsinki in January 1978. With some revision, they appear as Chapters I, II, and IV of this book. Chapter III is a slightly amended version of the Paish lecture I gave in March 1978 at the invitation of the Association of University Teachers of Economics in York, England. The lecture has been published in the Proceedings of the Association and is reprinted here with the kind permission of the Association. The reason for including it here is that it is highly complementary to the three Jahnsson lectures.

For these reflections on current macroeconomic theory, I owe considerable intellectual debt to William Brainard, Willem Buiter, Pentti Kouri, Gary Smith, Laurence Weiss, and Janet Yellen. But of course I alone am responsible for what I said in the lectures and publish in these pages. The Cowles Foundation for Research in Economics at Yale has provided, as always, not only intellectual stimulation and guidance, but also research support of all relevant kinds. Some of the work here reported was aided by the National Science Foundation and by the American Council of Life

Insurance. For help in preparing the lectures for publication I am grateful to Randall Mørck, Kathy Donahoo, and as always to my peerless secretary Laura Harrison.

Finally, I should like to express my appreciation to the Yrjö Jahnsson Foundation, my hosts in Finland, both for the opportunity to speak in their distinguished series and for their hospitality to me and my family.

New Haven
July 4, 1979

Introduction

The four lectures published here are about macroeconomic theory. These are troubled times for macroeconomics, both theory and application to policy. Our profession is deeply divided on essential points, on how to model the structures of our economies and on what government policies can improve their performance. Since the mid-1960s the degree of consensus once commanded by the post-Keynesian "neoclassical synthesis"¹ has decayed, along with confidence in the stabilizing potential of active fiscal and monetary intervention.

Many observers, economists and laymen, perceive a *crisis* in macroeconomics. Indeed the title of the now famous 1974 Jahnsson lectures of Sir John Hicks was, you will recall, *The Crisis in Keynesian Economics*.² But views differ

¹ The phrase originated with Paul Samuelson. See *The Collected Scientific Papers of Paul A. Samuelson* Vol. 2, M.I.T. Press, Cambridge, Mass., 1966, pp. 1111, 1271, 1543.

² J. R. Hicks, *The Crisis in Keynesian Economics*, Basil Blackwell, Oxford, 1974.

widely on the nature of the crisis, even more on the solution.

One view, prevalent among mathematical theorists of general equilibrium, is that traditional macroeconomic theory suffers from its lack of firm microeconomic foundations. The behavioral relations of macro models, it is said, are not rigorously derived from optimization by individual agents and from the clearing of markets in which optimizing agents participate. In short, macro models do not look like general equilibrium models.

Of course, it is hard to make them look like general equilibrium models without emptying the macro models of the aggregative simplicity, institutional content, and definiteness of conclusion which are their *raison d'être*. It is possible to give macro relations the veneer of rigorous derivation from utility or profit maximization by assuming the aggregate of firms to behave as if they were one firm, and so on. Since the procedure involves a dubious assumption of aggregation, it is not clear that it is as much an improvement of the rigor and robustness of macro relations as a gratification of the trained consciences of the theorists. For some important issues of macroeconomics, to which I shall refer in these lectures, the assumption that agents are all alike is clearly not appropriate and their differences in circumstances and behavior should somehow enter the model. Candid macro economists have never deceived themselves that the equations of their models were more than simple and approximate descriptions of the diverse responses of individual agents of ever-changing relative weights in the aggregates.

In any case, the physicians who have thus diagnosed the illness of the patient have themselves sought two different cures. One group accepts, at least tentatively, what they take to be basic empirical premise of Keynesian economics, namely that prices do not continuously clear all markets.

They take for granted, then, a disequilibrium set of nominal prices, i.e., prices of goods and labor in terms of the monetary unit at which labor and other commodities would be, if agents could make all the transactions they would individually like to make, in excess supply or demand. They then investigate how, at these given prices, the movements of quantities chosen by optimizing agents, constrained by the sales and purchases they are actually able to make, will balance supplies and demand. In the same vein Keynes showed how, if interest rates and prices do not equilibrate saving and investment, variation of aggregate income will. Contributors to this theoretical development include Leijonhufvud,³ Clower,⁴ Barro and Grossman,⁵ and more recently a distinguished group of French mathematical economists.⁶ Edmond Malinvaud gave a masterful sum-

³ A. Leijonhufvud, *On Keynesian Economics and the Economics of Keynes*, Oxford University Press, New York, 1968.

⁴ R. Clower, "The Keynesian Counter-revolution: A Theoretical Appraisal," in F. Hahn and F. Brechling, eds., *The Theory of Interest Rates*, Macmillan, London, 1965.

⁵ R. Barro and H. Grossman, "A General Disequilibrium Model of Income and Employment," *American Economic Review*, March 1971.

—, *Money, Employment and Inflation*, Cambridge University Press, Cambridge, 1976.

⁶ Some relevant references are:

E. Malinvaud and Y. Younes, "Some New Concepts for the Microeconomic Foundations of Macroeconomics," in G. Harcourt, ed., *Microeconomic Foundations of Macroeconomics*, Macmillan, New York, 1976.

—, "Une Nouvelle Formulation Generale pour l'Etude des Fondements Microeconomiques de la Macroéconomie," to be published in *Cahiers du Seminaire d'Econometrie*, C.N.R.S., Paris.

J.-M. Grandmont, G. Laroque, and Y. Younes, "Equilibrium

mary of their work in his 1976 Jahnsson lectures.⁷ I do not propose to discuss it in mine. I do notice, that for the case of excess supply of labor and other factors of production, the results closely replicate Keynesian multiplier and IS/LM analysis. The real balance effect, on which Barro-Grossman and Malinvaud rest analysis of the effects of an imposed scalar change in nominal prices, I shall be discussing in the first lecture.

The other team of diagnosticians, of which major names are Robert Lucas, Thomas Sargent, Neil Wallace and Robert Barro⁸ has taken quite a different tack. They find two fatal flaws in post-Keynesian macro models. First, they too complain that the agents inside those models don't

with Quantity Rationing and Recontracting," *Journal of Economic Theory*, October 1978.

J.-P. Benassy, "Neo-Keynesian Disequilibrium Theory in a Monetary Economy," *The Review of Economic Studies*, October 1975.

⁷ E. Malinvaud, *The Theory of Unemployment Reconsidered*, Basil Blackwell, Oxford, 1977.

⁸ Of their numerous papers I list here only:

R. Lucas, "Understanding Business Cycles," in K. Brunner and A. Meltzer, eds., *Stabilization of the Domestic and International Economy*, Carnegie-Rochester Conference Series on Public Policy, Vol. 5, North-Holland, Amsterdam, 1977.

—, "Econometric Testing of the Natural Rate Hypothesis," in O. Eckstein, ed., *The Econometrics of Price Determination*, Washington Publications Services, Federal Reserve Board of Governors, 1972.

T. Sargent and N. Wallace, "Rational Expectations and the Theory of Economic Policy," *Journal of Monetary Economics*, April 1976.

T. Sargent, "A Classical Macroeconometric Model for the United States," *Journal of Political Economy*, April 1976.

R. Barro, "Are Government Bonds Net Wealth?," *Journal of Political Economy*, November/December 1974.

appear to be behaving rationally. The emphasis of this complaint is on the expectations of prices and other variables on which consumers, workers, firms base their current behavior. In standard models, these critics say, expectations are not based on the full information the agents should be assumed to have; they are, moreover, often biased estimates of the future values the model itself would generate. This team proposes to remedy the inconsistency in modeling by their postulate of *rational expectations*, expectations which will under stable structure be on average confirmed by events.

Second, these theorists object to the premise that markets are sometimes not cleared by prices, the very assumption the other team—the analysts of disequilibrium as constrained equilibrium—take as their working premise. Total removal of this premise from short-run macroeconomics is like taking the Prince of Denmark out of Shakespeare's play *Hamlet*. So I shall argue in my second lecture, which is devoted to the "new classical macroeconomics," the name its protagonists have given theory which combines the two assumptions of rational expectations and continuous market clearing.

The controversy which this theory has opened is a resumption of an older theoretical battle forty years ago, provoked by Keynes's challenge to the old classical macroeconomics. Then too the issues were whether and how flexibility of nominal prices clears markets, in particular whether and how flexibility of wages and prices avoids excess labor supply, i.e., involuntary unemployment. Consequently, in the first lecture I shall reconsider the real balance effect, introduced by Keynes's classical antagonist Professor A. C. Pigou.⁹ This will provide background and

⁹ A. C. Pigou, "The Classical Stationary State," *Economic Journal*, December 1943.

perspective, I hope, for looking at the challenge of the new classical macroeconomics in the second and third lectures.

The second lecture is a general critique of the new doctrines. The third concerns a particular application of them, the so-called Ricardian equivalence theorem. As recently stated by Barro, the proposition is that rational expectation of future taxes deprives debt financing of government expenditures of all macroeconomic effect. The expenditures may make a difference, but whether they are financed by borrowing or by taxation does not matter.

The fourth lecture also derives its motivation, at least in part, from recent dissatisfactions with macroeconomic theory, particularly with the standard Hicksian IS/LM apparatus as often used and interpreted. A flaw in that apparatus, it has been alleged, is that it does not respect "the government budget constraint," the obvious fact that government deficits must be financed by issuing either money or non-monetary debt. Neglect of this identity—a better word than constraint—is said to be responsible for misleading, possibly even for perverse, conclusions about the effects of fiscal policy.¹⁰ In the fourth lecture I try to explain

¹⁰ Some of the relevant references are:

C. Christ, "A Short Run Aggregate-Demand Model of the Interdependence and Effects of Monetary and Fiscal Policies with Keynesian and Classical Interest Elasticities," *American Economic Review*, May 1967.

—, "A Simple Macroeconomic Model with a Government Budget Restraint," *Journal of Political Economy*, January/February 1968.

D. Ott and A. Ott, "Budget Balance and Equilibrium Income," *Journal of Finance*, March 1965.

W. Silber, "Fiscal Policy in IS-LM Analysis," *Journal of Money, Credit, and Banking*, November 1970.

The literature has been critically reviewed by:

A. Blinder and R. Solow, "Analytical Foundations of Fiscal

how this problem is only one aspect of a general problem, that of modeling stocks and the flows that change stocks. I make a suggestion on how to handle the general problem and illustrate it by models examining the effects of macro policies in closed and open economies. On the particular question whether conventional conclusions about fiscal and monetary effects are reversed when the government budget identity is explicitly modeled, my conclusion is generally negative.

Policy," *The Economics of Public Finance*, Brookings Institution, Wash., D.C., 1974.

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I

Real Balance Effects Reconsidered

Keynes and Underemployment Equilibrium

Let us go back to the 1930s and to the theoretical controversy ignited by Keynes's iconoclastic *General Theory*, published in 1936.¹ Keynes claimed to have found underemployment equilibrium. The word is *equilibrium*. For Keynes was not content to assert the empirical possibility, even the likelihood, of involuntary unemployment, indeed of stubbornly persistent involuntary unemployment. That was, after all, scarcely an extravagant observation after seven years of world-wide depression and a decade of high unemployment in Britain. As a matter of theoretical principle, he went much further. The *General Theory*, particularly in its opening three chapters, denies the existence of self-correcting market mechanisms which would eliminate excess supplies of labor and other productive resources. It denies their existence, furthermore, in a competitive

¹ J. Keynes, *The General Theory of Employment, Interest and Money*, Macmillan, London, 1936.

economy; Keynes does not say that the mechanisms fail because of misguided government interventions in the price system—minimum wages and the like—or because of private combinations in restraint of trade—trade unions and industrial cartels. Instead he challenges orthodoxy on sacred ground, its faith that competition will so adjust prices of products and factors as to eliminate excess supplies, or demands, in all markets. He does not say merely that this process may take a very long time; he says that it does not work at all. The challenge was deliberate and explicit. The mistaken orthodoxy he described, somewhat imprecisely, as “classical” theory, and its foremost exponent he identified as his own Cambridge friend, colleague, fellow-student of Marshall, Professor A. C. Pigou. Pigou was not slow to take up the challenge.

Keynes's argument for *equilibrium* with involuntary unemployment had two strands. The first was an explanation why the price of labor—the money wage rate—did not fall in the face of excess labor supply. The second was an explanation why even if it did fall, as it should in a well-behaved competitive market, the result would not be an increase in employment. (Keynes hinted that the two points might be related, in the sense that one reason for labor resistance to wage deflation could be an intuitive appreciation of its futility.) Pigou's response was devoted primarily to the second point, and that is also the primary concern of this lecture.

As for the first point, Keynes's argument was that unemployed workers have no effective way to signal to employers their availability for work at a lower *real* wage. The money wage itself is not set in an auction market where unemployed workers can bid for jobs against each other and against employed workers. It is set by employers unilaterally or in concert with their employees, organized or unorganized: in either event, the chief concern is the wage rate

relative to wages in competing firms or in comparable occupations and situations, and not the availability of cheaper workers at the factory gates. The special position of the inside work force, whether organized or not, derives from its possession, individually and collectively, of firm-specific skill and experience.

These observations, which I have liberally paraphrased, are to a considerable degree convincing. Many of them are now being formalized, in what is currently known as implicit contract theory² and in application of capital theory and bilateral monopoly theory to employer-employee relations. Now, as in the Depression, they explain why established wage patterns—whether they involve annual wage increases of 8 or 10% or simply downward stickiness of wage levels—are eroded only very slowly by unemployment. But they do not say that money wages will not erode at all. The same economic climate that generates high unemployment also impairs employers' ability to pay high and increasing money wages to their existing employees. Layoffs, plant closings, bankruptcies, and threats of such disasters, confront employed workers with choice between wage concessions and loss of jobs. The Great Depression, as well as the recent severe recession, provides numerous examples. Thus Keynes's first point serves better to emphasize the difficulty and slowness of melting frozen wage levels or wage-increase patterns than to establish that they never melt at all. Presumably on similar reasoning, Professor Pigou concentrated his counter-fire on the second point.

² M. N. Baily, “Wages and Employment Under Uncertain Demand,” *Review of Economic Studies*, January 1974.

—, “On the Theory of Layoffs and Unemployment,” *Econometrica*, July 1977.

C. Azariadis, “Implicit Contracts and Underemployment Equilibria,” *Journal of Political Economy*, December 1975.

Deflation and Aggregate Demand

According to Keynes, there are theoretically conceivable and empirically important circumstances in which reduction of money wage rates would not succeed in increasing aggregate demand for goods and services. Production and employment would remain unchanged. Prices would be lower in the same proportion as wages. Real wages, real profit margins, indeed all real variables, would be unaffected. In short, the real equilibrium of the economy—unemployment and all—is independent of the level of money wages and prices. It is of course not independent of the real wage. Employers would offer more employment at a lower real wage, and workers—whether previously employed or unemployed—would be glad to accept it. But unless a reduction of the *money wage* would somehow increase aggregate *real* demand, there is no mechanism by which the mutual latent willingness to demand and to supply more labor at a lower real wage—or possibly even at the same real wage—could be actualized. This is the Keynesian impasse.

In fact, Keynes himself described one way out of the impasse, a mechanism which considerably restricted the generality which he seemed to be claiming for it in the first part of his great book. This mechanism, sometimes called the “Keynes effect,” was the following: At lower money wages, prices, and incomes, supply of money would be larger in real volume or in Keynes’s own wage units. The transactions demand for cash would be smaller; the excess stock of cash would bid up the prices of interest-bearing securities and lower interest rates. At lower interest rates real investment would be higher. Thus aggregate demand, further boosted by the multiplier, would expand output and employment. Hence wage and price deflation is an equi-

valent—a bizarre and second-best equivalent in Keynes’s view—to expansionary monetary policy. If one will work, so will the other.

Here enters the famous liquidity trap, the situation in which an increase in the *real* quantity of money, whether by active central bank intervention or by deflation, will be ineffectual. This is the situation in which interest rates relevant to investment are already as low as they can go. The absolute floor for nominal interest rates is zero, the return on money itself. The effective floor, at which people will be indifferent between holding money idle and buying interest-bearing assets, might be, Keynes thought, a bit above zero. Even short term government paper would have to provide a minimal fractional gain relative to hoarding money, to compensate for transactions costs, imperfect liquidity, and risk. Long term interest rates, which could be regarded as an average of current and expected short rates, would be held above zero by expectations, or simply fears, that short rates will rise from rock bottom in future.

Like money wage patterns, such stickiness might be regarded as a disequilibrium phenomenon, in principle transient even if in practice stubborn. But all Keynes really needs anyway is the zero floor, combined with the possibility that the full employment equilibrium real interest rate—the Wicksellian natural rate that equates full employment investment and saving—is below zero. That is a possibility which, it seems, cannot be excluded by *a priori* restrictions on technology and taste.

The Pigou Effect

Or can it be? Pigou did not regard the liquidity trap impasse as particularly plausible. But he accepted it for the sake of

argument, and pointed out that the real value of the wealth of the community would be increased by deflation. Money, and other assets denominated in money, are part of the public's wealth. At lower prices their purchasing power is greater, while the real value of wealth held in the form of goods is unchanged. People save to accumulate wealth to provide for their consumption, or that of their heirs, in future periods and contingencies. When the real value of their existing assets is increased, these purposes are more adequately satisfied and they will increase current consumption at the expense of saving. This is the Pigou or "real balance" effect.³

Pigou's first try misfired. Kalecki⁴ reminded him in print that the largest part of private holdings of monetary assets, including bank deposits counted as money, had direct or indirect counterpart in private debt. Deflation raised the burden of the debts as much as the real value of the assets. As Pigou acknowledged, the correction left him with a much smaller net base. One component is the part of the public's money stock supplied directly by the government: currency and coin and their equivalent in central bank deposits held as bank reserves, the quantity currently denoted as the monetary base or high-powered money or outside money.

A possible second component is the public's holdings of non-monetary interest-bearing government obligations. Whether these, or any fraction of them, constitute net wealth has been a matter of controversy at least since

³ A. C. Pigou, "The Classical Stationary State," *Economic Journal*, December 1943.

⁴ M. Kalecki, "Professor Pigou on 'The Stationary State'—A Comment," *Economic Journal*, April 1944.

A. C. Pigou, "Economic Progress in a Stable Environment," *Economica*, August 1947.

Ricardo,⁵ and the debate still rages today.⁶ I will discuss it at some length in the third lecture. The question is whether taxpayers, anticipating that taxes will be levied to service a larger real public debt, regard themselves as poorer in the same degree as the bondowners regard themselves as wealthier. Even if the government debt is washed out on this account, the monetary base remains. So presumably do those government obligations which in the liquidity trap have become the equivalent of money, bearing zero or minimal interest. As Leontief has observed, sufficient deflation of money wages and prices can make it possible to purchase the whole GNP with one dime.⁷ Presumably by then the Wicksellian natural interest rate, equating full employment saving and investment, would be well in the positive orthant and the Keynesian impasse would be escaped.

Pigou relied on the response of consumption and saving to wealth; this tradition, reinforced by Patinkin,⁸ has been followed by most theorists. However, an argument with parallel import could be made that increasing the real value of monetary wealth is favorable to *investment*. Portfolio theory suggests that wealth-owners, finding themselves not only with larger wealth but with a larger share of it in

⁵ D. Ricardo, *The Principles of Political Economy and Taxation*, E. P. Dutton, New York, 1912, pp. 161, 198–9.

⁶ R. Barro, "Are Government Bonds Net Wealth?," *Journal of Political Economy*, November/December 1974.

⁷ Quoted by P. Samuelson in "A Brief Survey of Post-Keynesian Developments," *Keynes' General Theory: Reports of Three Decades*, Robert Lekachman, ed., St. Martin's, New York, 1964, p. 333.

⁸ D. Patinkin, "Price Flexibility and Full Employment," *American Economic Review*, September 1948; and in *Money, Interest and Prices*, 2nd ed., Harper and Row, New York, 1965.

monetary form, will wish to shift towards goods or equities. Thus they may lower the effective yields required of investments in consumers' or producers' durable goods, relative to those available on money and Treasury bills or bonds. This change in the structure of interest rates could be favorable to investment even if rates on secure liquid nominally denominated assets were stuck in the trap.

The Pigou effect breaks the correspondence between deflation and monetary policy. Keynes could no longer say that anything deflation can do, monetary policy can do (and can do with less trauma). He could say—though I don't think he did, busy as he was with practical affairs—that the Pigou effect of deflation could be duplicated by fiscal policy, specifically by government spending or tax reduction financed by printing money. That would not only provide direct fiscal stimulus but also, like Pigou's deflation, add to the public's wealth and specifically to its monetary component.

In some modern minds, the question may arise how in either case wealth is increased in any meaningful sense. From a larger perspective, does not the wealth of a nation consist of its real productive assets, human and nonhuman? These are what an outside observer, say in a space satellite with a powerful telescope, would enumerate and value. (I and he leave aside claims on the rest of the world. The argument concerns a closed economy; Keynes did not contest the traditional view that deflation could work for a small open economy with a fixed exchange rate.) How can a nation make itself richer either by printing pieces of paper or by increasing their value by charging each other fewer of them in exchanges of goods and services? The answer, I think, is in two parts. First, the social contrivance of commonly acceptable money, facilitating contemporaneous and intertemporal exchange, is of social value to the nation

collectively as well as to holders individually. Its contribution to national wealth may well depend on its aggregate amount. Second, in the particular situation under discussion, it is only a breakdown—whether temporary or permanent—in *internal* arrangements which is responsible for failure to use fully the real productive assets of the economy. If additional monetary assets remedy the breakdown, the real national wealth they represent is the value of the resulting stream of gains in production and consumption.

Irving Fisher on Deflation and Debt

Earlier in the same Great Depression another great economist, Irving Fisher, had reached a diagnosis precisely the opposite of Pigou's.⁹ Fisher thought that *reflation*, not deflation, was the remedy. He was struck by the increased burden that lower prices imposed on debtors—corporations, proprietors, home-owners, farmers. Debt squeezes, defaults, and bankruptcies, he thought, intensified and spread the slump in economic activity. He urged measures—monetary expansion, devaluation, marking up gold prices—designed to restore commodity prices to pre-Depression levels. For Fisher in 1932–3, more even than Keynes in 1936, raising prices was a step indispensable to recovery, not just an incidental byproduct of other measures.

I recall Fisher's position not solely from Yale patriotism but to bring our attention back to the casual "washing out" of private debts and credits in the reckoning of the base for

⁹ I. Fisher, "The Debt Deflation Theory of Great Depressions," *Econometrica*, October 1933, p. 337.
—, *100% Money*, Adelphi, New York, 1936, especially pp. 119–34.

the Pigou effect. The gross amount of these "inside" assets was and is orders of magnitude larger than the net amount of the base. Aggregation would not matter if we could be sure that the marginal propensities to spend from wealth were the same for creditors and debtors. But if the spending propensity were systematically greater for debtors, even by a small amount, the Pigou effect would be swamped by this Fisher effect.

There are indeed reasons for expecting, or at least for suspecting, just that. The population is not distributed between debtors and creditors randomly. Debtors have borrowed for good reasons, most of which indicate a high marginal propensity to spend from wealth or from current income or from any liquid resources they can command. Typically their indebtedness is rationed by lenders, not just because of market imperfection but because the borrower has greater optimism about his own prospects and the value of his collateral, or greater willingness to assume risk and to die insolvent, than the lender regards as objectively and prudently justified. Business borrowers typically have a strong propensity to hold physical capital, producers' durable goods. Their desired portfolios contain more capital than their net worth—they like to take risks with other people's money. Household debtors are frequently young families acquiring homes and furnishings before they earn incomes to pay for them outright; given the difficulty of borrowing against future wages, they are liquidity-constrained and have a high marginal propensity to consume.

When nominal prices and wages are deflated, debt service is a higher proportion of debtors' incomes, and the reduction or elimination of their margins of equity disqualifies them from further access to credit. Bankruptcies and defaults do likewise, and transmit the distress of debtors to their creditors, threatening the solvency and liquidity of

individual lenders and financial institutions. Debtor corporations, their equity positions impaired, give priority to restoration of financial structure above real investment. The declines in real market value of their equities due to the greater burden of their debts far surpass the gains to creditors. These items in the Fisher scenario may well overshadow the positive effects of the increased real value of creditors' nominal assets.

These considerations do not apply solely to ancient history. Imagine the distress which would occur if debtors who have borrowed in the 1970s in anticipation of continued inflation were suddenly to find themselves confronted by price stability. Maybe Leontief is right that sufficient deflation would make existing coins capable of buying the whole GNP. It would also make existing debts an astronomical multiple of the GNP.

Short and Long Run Effects of Prices on Aggregate Demand

To give Pigou and Fisher each his due, I am led to make a distinction between the "long run" consequences of deflation and the "short run." Perhaps the Pigou effect applies to the first, the Fisher effect to the second. I am sure that Pigou himself was conscious of this distinction, for he entitled his final contribution to this subject "The Classical Stationary State." His successors have been less careful, confidently stressing real balance effects in short-run macroeconomic analysis.

To understand the long run Pigou effect, we must use our imagination and carry out a counter-historical "as if" experiment. Imagine two alternative histories of the same economy, over the same period of time. A common feature of the two histories is the nominal value of the monetary base at each point in time; this is the same in history I and

history II. At the outset and for an extended period thereafter both economies are in a liquidity trap and are suffering unemployment. During this period nominal wages and prices are 50% lower in history II than in history I, though real wages, other relative prices, and real quantities are in the beginning the same. The period lasts long enough for all debts earlier contracted to mature and to be repaid or recontracted; alternatively, all debts outstanding were contracted with foreknowledge of the prices in each history. Pigou would say that history II would show higher employment and output than history I and would reach full employment sooner. I agree.

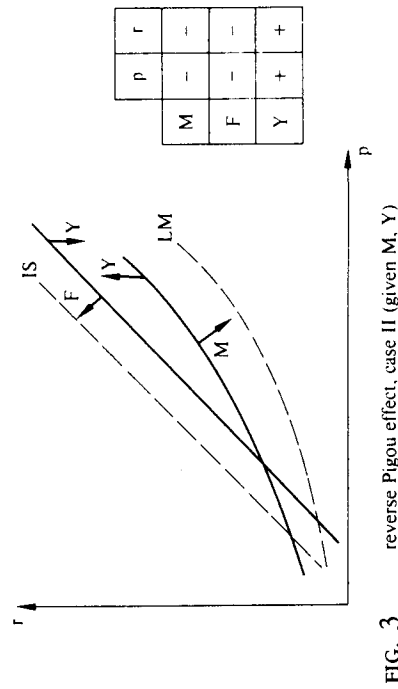
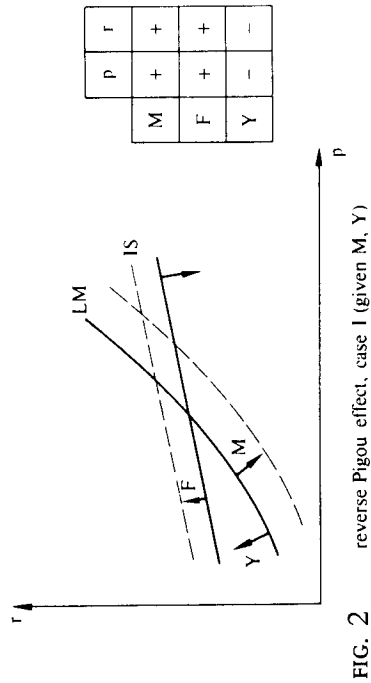
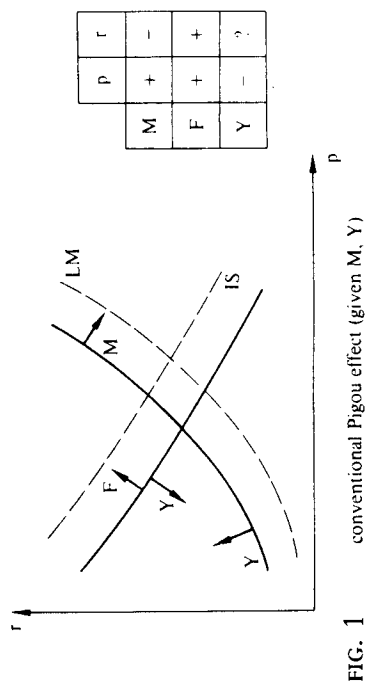
Unexpected price reduction in a single history—low prices following high prices sequentially—is an entirely different matter. Contracts made when prices were higher and expected to be higher remain in force. Fisher's observations apply. It would take a very long time before such contracts were worked off, and even then the economy would not be the same as if they had never existed.

Prices and Output in Short-run Macro Models

At this point, I would like to make a mildly technical digression. If, as I suspect, Fisher was very likely right about the short run effects of movements of price level on aggregate real demand, what does this imply for short-run macro models? Does it mean that the IS curve in r - Y space shifts upward as the price level rises in cyclical expansion? That the IS curve in r - p space for a given level of output, e.g. the full employment level, is upward sloping? Before drawing these conclusions we should remember a short-run price level effect of much greater importance now than in Fisher's time. This is the progressive structure of taxation relative to *nominal* incomes and profits; during a short run before

legislative adjustment, the fact that taxes are a larger share of given real income at higher prices works in Pigou's direction. But even if the Fisher effect is stronger, and the answers to the questions above about the relation of IS loci to price levels are affirmative, this does not mean that the IS and LM loci jointly yield a positive rather than negative association of Y and p for given settings of policy. The Keynes effect—the fact that a given nominal supply of money is smaller in real value the higher the price level—still works in the conventional direction. Particularly at high levels of output and interest, far from the liquidity trap, it may well dominate any direct price level effects on wealth and spending. The curvature of the liquidity preference schedule, then, contributes asymmetry to the situation. Altogether, aggregate demand could be positively related to price level at low levels of output and interest rates but negatively related closer to full employment. This does open some possibility of multiple equilibria.

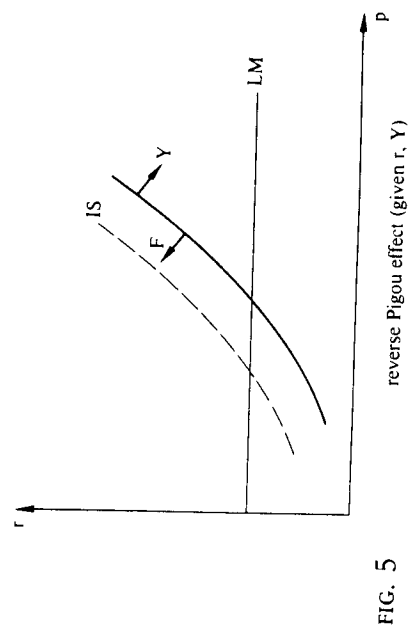
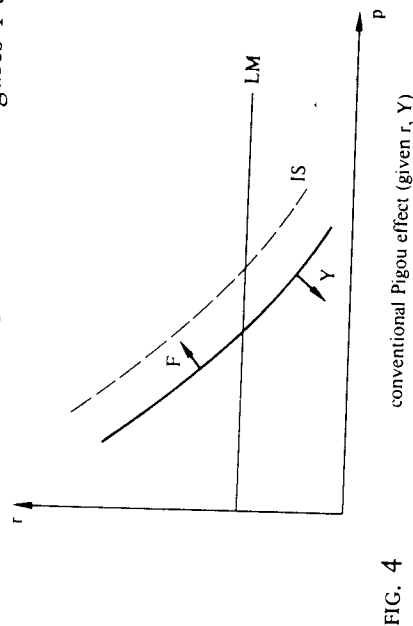
The situation can be analyzed with the help of some diagrams. In Figures 1–3, LM and IS loci are drawn for given values of the nominal money stock M and of real national product Y . They represent combinations of interest rate and price level consistent on the one hand with monetary balance, and on the other hand, with balance in demand and supply of goods. Figure 1 shows the conventional story, including the Pigou effect. The LM locus is upward sloping: the real stock of money is lower when the price level is higher, and it takes a higher interest rate to induce the public to handle transactions with smaller cash holdings. The IS locus is downward sloping: according to the conventional Pigou effect, a higher price level means less demand for goods and services, and it takes a lower interest rate to offset this effect. As the diagram also says, expansionary monetary policy "M" shifts LM to the right, while expansionary fiscal policy "F" shifts IS upwards. An



increase in Y shifts LM up (more demand for money at any given P) and shifts IS down (assuming the marginal propensity to spend is less than 1). The effects on p and r are also summarized in the accompanying table.

Figures 2 and 3 show a reverse Pigou effect or Fisher effect. The IS locus is upward sloping, because the spending by debtors encouraged by higher p exceeds the spending by creditors deterred. In Figure 3 the effect is so great that IS is steeper than LM , and the comparative statics of monetary and fiscal policy are reversed.

Figures 4 and 5 are special cases of Figures 1 and 3, in



which the Keynes effect is eliminated. This would apply in the liquidity trap, or in the event of an accommodative monetary policy that pegged the interest rate. Note that in Figure 5, as in Figure 3, p and Y are positively rather than negatively associated.

Figures 1–5 have two uses. A direct application is to the classical flexible price world with real output Y supply-determined. Reversing the Pigou effect alters some traditional comparative static results. An indirect application is to the Keynesian world of demand-determined Y . This is done in Figures 6 and 7. The first panels of Figures 6 and 7

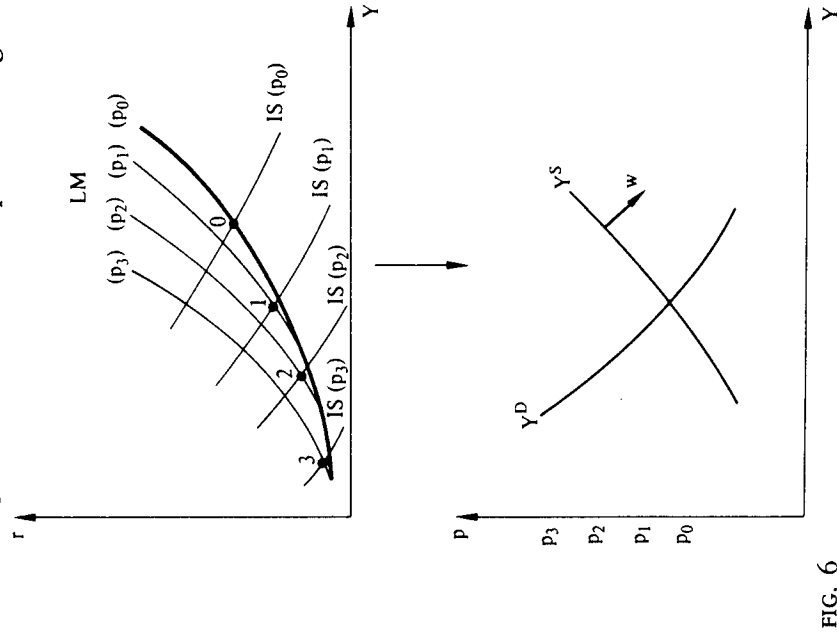


FIG. 6

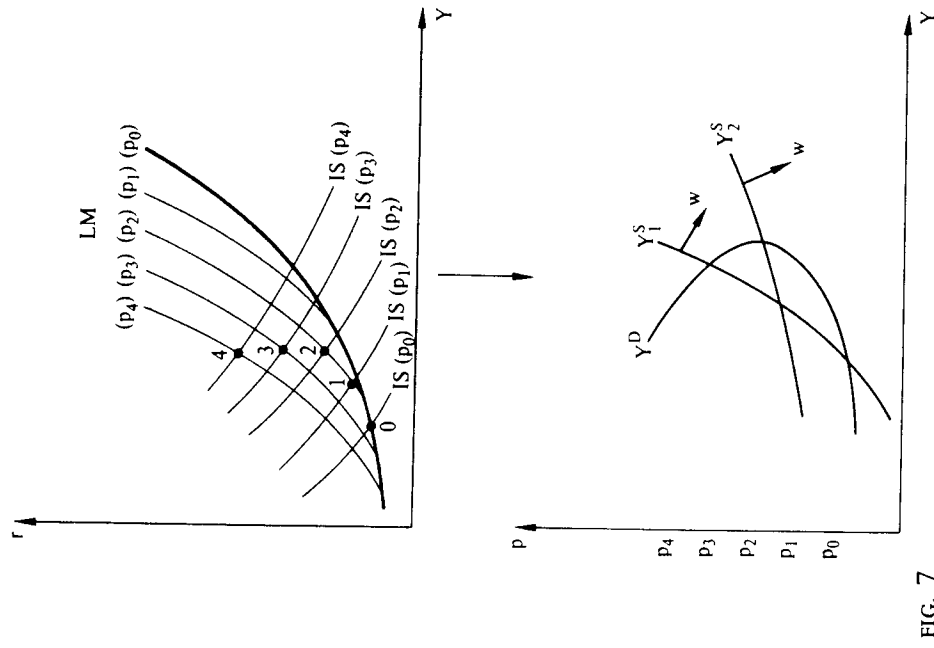


FIG. 7

show IS and LM loci in traditional (Y, r) space. Each locus assumes M and p , but a family of curves are drawn for various values of p , $p_0 < p_1 < p_2 \dots$. The various IS/LM solutions, numbered in the panel, are translated into the second panel, where they form the Y^D relations. In Figure 6 this has the expected downward slope, implying for

example that a reduction of money wages (depicted as a downward shift of Y^s) would raise employment and output. But in Figure 7, the Pigou effect reversal makes Y^D change directions, rendering ambiguous the consequences of a money wage reduction (compare shifts of Y_1^s and Y_2^s) and opening the possibility of dual equilibrium (Y_1^s).

Conclusion for Theory and Policy

There is another important difference between the two cases earlier distinguished, the "as if" comparison of alternative price levels and the sequential deflation. Deflation in real time—unless engineered by governmental fiat rather than by markets—may generate expectations of further deflation. Now expected deflation increases the demand for money, making it more attractive relative to other assets, particularly to goods and equities in goods. This effect counters the price level effect and may be stronger. If so, deflation does not correct the initial deficiency in aggregate demand that triggered it. Then deflation has no stopping point. The symmetrical case is hyper-inflation, in which the velocity of money rises astronomically.

Both Keynes and Pigou were aware of this problem as a practical matter but did not regard it as a part of their theoretical game. They were too purist. Recall the central issue: Does the market economy, unassisted by government policy, possess effective mechanisms for eliminating general excess supply of labor and productive capacity? This question applies to real time and to sequential processes. Therefore the static long run "Pigou effect" does not entitle anyone to give a positive answer.¹⁰

¹⁰ J. Tobin, "Keynesian Models of Recession and Depression," *American Economic Review*, *Papers and Proceedings*, May 1975.

This does not mean that Keynes wins the more abstract battle of theoretical principle. He did not show the existence of an excess-supply *equilibrium*, at least not in the meaning of the magic word equilibrium in the classical, or neoclassical, economics he was criticizing. In that meaning, equilibrium is a stationary state, and a state in which expectations are fulfilled. A sequence in which wages and prices are falling, and in which debts are embarrassing debtors who never anticipated prevailing wages and prices, is not such a state. Pigou succeeds in restricting "equilibrium" to situations in which markets clear, and Keynes's proposed equilibrium with involuntary unemployment does not qualify.

But why should Keynes care about such semantics? His important message was that Pigou's equilibrium may not be globally stable, that even if it is stable, disequilibrium can be protracted and stubborn. The forces which lower money wages and prices are slow and weak, and those which translate deflation or disinflation into greater real demand are uncertain. As Keynes also knew, protracted underproduction and under-utilization severely damages the marginal efficiency of capital. In mild and short-lived recessions investment is buoyed by belief that high employment and prosperity are the long-term norm. Once this confidence is destroyed, as contemporary events again demonstrate, it is terribly difficult to revive it. The practical moral is that active policy, along with market response, is part of the social mechanism for maintenance or restoration of equilibrium.