Price Flexibility and Output Stability: An Old Keynesian View

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In this symposium I shall play the role in which I was cast, the unreconstructed old Keynesian. Time was when I resisted labels and schools, naively hoping that our fledgling science was outgrowing them. I had, to be sure, been drawn into economics when *The General Theory* was an exciting revelation for students hungry for explanation and remedy of the Great Depression. At the same time, I was uncomfortable with several aspects of Keynes' theory, and I sought to improve what would now be called the microfoundations of his macroeconomic relations.

The synthesis of neoclassical and Keynesian analysis achieved in the 1950s and 1960s promised a reconciliation of the two traditions, or at least an understanding of the different contexts to which each applies. The hope and the promise were premature, to say the least. In the last 20 years, the dominant trend in macroeconomics has dismissed Keynesian theory. Nevertheless, Keynesian models continue to prove useful in empirical applications, forecasting and policy analysis. Macro-econometric models are mostly built on Keynesian frameworks. The gulfs between doctrine and observation, between theory and practice, are chronic sources of malaise in our discipline.

I have benefitted from Gregory Mankiw's "refresher course" in modern macroeconomics (1990). He writes that recent developments—methodological,

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new classical, and new Keynesian—are to old macroeconomics as Copernicus was to Ptolemy. It just takes time before Copernican truths can outdo Ptolemaic approximations in practical applications.

Considering the alternatives, I do not mind being billed as a Keynesian, an old Keynesian at that. But old Keynesians come in several varieties, and I speak for no one but myself. Nor do I defend the literal text of *The General Theory*. Several generations of economists have criticized, amended, and elaborated that seminal work. I shall argue for the validity of the major propositions that distinguish Keynesian macroeconomics from old or new classical macroeconomics.

Summary of the Keynesian Case

The central proposition of Keynesian economics is commonly described as follows: "According to the Keynesian view, fluctuations in output arise largely from fluctuations in nominal aggregate demand. These fluctuations have real effects because nominal wages and prices are rigid" (Ball, Mankiw, and Romer, 1988, p. 1). On the contrary, I shall argue that Keynesian macroeconomics neither asserts nor requires nominal wage and/or price rigidity. It does assert and require that markets not be instantaneously and continuously cleared by prices. That is a much less restrictive assumption, and much less controversial. It leaves plenty of room for flexibility in any commonsense meaning of the word.

Keynesian models were said to be vulnerable to the charge that "the crucial nominal rigidities were assumed rather than explained," although "it was clearly in the interests of agents to eliminate the rigidities they were assumed to create.... Thus the 1970s and 1980s saw many economists turn away from Keynesian theories and toward new classical models with flexible wages and prices" (Ball, Mankiw, and Romer, 1988, p. 2). Those market-clearing models have not just flexible prices but *perfectly* and *instantaneously* flexible prices, an assumption that is surely more extreme, more arbitrary, and more devoid of foundations in individual rational behavior than the imperfect flexibility of Keynesian models.

The central Keynesian proposition is not nominal price rigidity but the principle of effective demand (Keynes, 1936, Ch. 3). In the absence of instantaneous and complete market clearing, output and employment are frequently constrained by aggregate demand. In these excess-supply regimes, agents' demands are limited by their inability to sell as much as they would like at prevailing prices. Any failure of price adjustments to keep markets cleared opens the door for quantities to determine quantities, for example real national income to determine consumption demand, as described in Keynes' multiplier calculus.

For this reason, Keynesian macroeconomics alleges that capitalist societies are vulnerable to very costly economy-wide market failures. Individuals would be willing to supply more labor and other resources in return for the goods and services the employment of those resources would enable them to consume now or in the future, but they cannot implement this willingness in market transactions. As the quotation from Ball, Mankiw, and Romer suggests, many contemporary theorists cannot believe any theory that implies socially irrational market failures. They suspect that individual irrationalities are lurking somewhere in the theory. In continuously price-cleared competitive markets, they know, individually rational behavior implies collectively rational outcomes. But this theorem does not apply if markets and price-setting institutions do not produce perfectly flexible competitive prices. Individual rationality does not necessarily create the institutions that would guarantee "invisible hand" results. Keynes was not questioning the rationality of individual economic agents; he was arguing that their behavior would yield optimal results if and only if they as citizens organized the necessary collective institutions and government policies. In the same spirit though in different contexts, some modern theoretical research has shown that welfare-improving policies may be designed even when asymmetries of information and incompleteness of markets prevent the achievement of global optima.

Ball, Mankiw, Romer and others style themselves as New Keynesians. Their program is to develop improved microeconomic foundations for imperfectly flexible prices. In the process, they hope to illuminate the paradox that individually rational or near-rational behavior can result in significant collective market failures. These are certainly laudable objectives. In the end, I suspect, the program will not change the essential substance of Keynesian macroeconomics. But it will make Keynes more palatable to theorists.

In Keynesian business cycle theory, the shocks generating fluctuations are generally shifts in *real* aggregate demand for goods and services, notably in capital investment. Keynes would be appalled to see his cycle model described as one in which "fluctuations in output arise largely from fluctuations in nominal aggregate demand" (Ball, Mankiw, and Romer 1988, p. 2). The difference is important. The impact on real purchases of a one-time one percent shock to aggregate nominal spending will be eroded if and as nominal prices increase in response, and eliminated once prices have risen by the same one percent as nominal spending did. But suppose it is real demand that initially rises one percent. At the prevailing prices nominal spending will rise one percent too. But if and as prices rise in response the one percent real demand shock becomes an ever larger amount of nominal spending. Its impact is not mechanically eroded by the price response; if it is absorbed, the process is subtle and indirect.

The big issue between Keynes and his "old classical" opponents was the efficacy of the economy's natural market adjustment mechanisms in restoring full employment equilibrium, once a negative real demand shock had pushed

the economy off that equilibrium. Keynes and Keynesians said those mechanisms were weak, possibly nonexistent or perverse, and needed help from government policy. That is still the major question of macroeconomic theory and policy, even though new classical economists finesse it by assuming that the economy can never be pushed out of equilibrium even for a moment. Keynes' classical contemporaries and predecessors would never have drawn real-world lessons from theories based on such an assumption. Their successors strain credulity when their models imply that markets are cleared and joblessness is voluntary when measured unemployment is 10 percent as truly as when it is 5 percent.

Keynesian theory of nominal wage stickiness does not deserve the disdain with which it is commonly regarded. It is not dependent on "money illusion." But Keynes certainly would have done better to assume imperfect or monopolistic competition throughout the economy, in both product and labor markets. In markets of these kinds, nominal prices are decision variables for sellers or buyers or are determined by negotiations between them. They therefore move only at discrete intervals. Despite considerable effort over the years to give macroeconomics improved microfoundations along these lines, there is plenty of scope for the "New Keynesian" program of theoretical and empirical research on this topic.

In the absence of perfect flexibility, does greater flexibility of nominal prices strengthen the equilibrating mechanisms, or does it weaken them? Keynes doubted that the problems of involuntary unemployment and underutilized capacity would be mitigated by greater flexibility of nominal wages and prices. On the whole, he favored stable nominal wages. Critics of Keynesian macroeconomics forget this strand of the argument when they assume that without absolute "rigidity" aggregate demand could never be deficient. Fortunately, this issue has been receiving greater attention in the last few years, with considerable support for Keynes' position.

Macroeconomics with Effective Demand Constrained

The empirical relevance of Keynesian economics is based on its assertion that situations of pervasive excess supply often occur. An advanced capitalist industrial economy is frequently in a state in which most labor and product markets are not clearing at prevailing prices. As a result, workers are involuntarily unemployed and capital capacity is underutilized. The effective constraint on output is the aggregate demand for goods and services; likewise the effective constraint on employment is the amount of labor required to produce that output.

Keynesian unemployment must be differentiated from both frictional and classical unemployment. Frictional unemployment occurs because of

microeconomic flux. Demands and supplies are continually shifting, bringing unemployment and excess capacity in some sectors and contemporaneous labor shortages and capacity bottlenecks elsewhere. The gross aggregates of these frictional excess supplies and excess demands vary together positively over time. In contrast, cyclical excess supplies and demands are negatively correlated; in economy-wide recessions and depressions, excess-supply markets and sectors predominate, while the reverse is true in inflationary booms. The amount of frictional unemployment depends on the strength of intersectoral shocks and on the mobility of factors of production in responding to them. Large and protracted shocks, for example in technology or in supplies and prices of key commodities like energy, convert frictional unemployment to *structural* unemployment. Neither is remediable by demand expansion alone.

A common species of classical unemployment occurs when jobs are limited because of excessive real wage rates imposed by governmental or trade union regulations. For individuals who would like to work at or below the wage floor, such unemployment is involuntary. For the workers collectively whose bargaining strength or political clout established the regulations, the unemployment could be regarded as the voluntary consequence of their exercise of monopoly power.

Identification of observed unemployment as classical or Keynesian is sometimes difficult. In either case unemployment might be observed to be associated with real wages above their full employment equilibrium values. In the Keynesian case, this could result from perfect competition among producing firms; they would be paying workers the high marginal products associated with low employment. The big difference between the two cases is that in the Keynesian case, but not in the classical case, real wages would decline on their own and output and employment would increase in response to expanded demand. In the classical case removal of the regulations would be essential.

There are several variations on the classical unemployment theme. One case is queuing for a high-wage job. An artificially high wage in a particular sector could draw workers from employment elsewhere to wait and hope. This model was originally designed to explain the heavy unemployment in the urban centers of developing countries, where the queuing requires living near the scarce jobs, far from alternative means of subsistence in traditional agriculture. It fits less well in advanced economies, where workers can search and apply for better jobs while employed. Another source of voluntary unemployment may be unemployment insurance benefits and other transfers that increase the reservation prices of persons without jobs. However, in the United States, where unemployment is measured by large household surveys conducted monthly by the Census, persons without jobs will be counted not as unemployed but as "not in labor force" unless they report they have been actively searching. Although some misreporting doubtless occurs, it is small, not always in the same direction, and cannot begin to account for the cyclical variability of unemployment rates.

Agents who are unable to sell as much as they would like at prevailing prices restrict demands in other markets. Unemployed workers cut their consumption. Demand-constrained firms restrict their hiring of labor and their purchases of other inputs. Keynes' insight that quantities actually sold, if smaller than sales desired at existing prices, will keep demands in other markets below equilibrium values, was rediscovered and elaborated by self-styled "disequilibrium theorists" 30 years later (Barro and Grossman, 1971). In old Keynesian economics, multiplier theory formalized the determination of quantities by quantities. It did not and does not, however, preclude the relevance of other determinants of demand, notably prices and interest rates. In this respect it is more general than most of its latter-day extensions in "disequilibrium theory." In demand-constrained regimes, any agent's increase in demand—for example, more investment spending by a business firm—has positive externalities. It will increase the attainable consumption of third parties. In some modern literature, this idea of Keynes is revived and elaborated under the label "strategic complementarity" (Cooper and John, 1988).

Liquidity constraints are an important but extreme form of effective demand constraint. Some wage earners, no doubt, depend on each week's wages to buy the goods for that week's consumption. But Keynes' principle does not depend on such short horizons for consumption-smoothing. Expectations of future spells of unemployment, enhanced by present and recent experience, can limit the current consumption and durables purchases even of long-horizon households. Liquidity constraints and prospective effective demand constraints can also limit business investment. Common observation suggests that households and businesses, and governments too, differ widely in their horizons, i.e. the length of the future period over which expected resources are regarded as potentially available for spending today. These horizons, moreover, doubtless change over time with circumstances and behavior.

The multipliers relating change in aggregate demand to demand shocks, from policies or other events, are not as large as they were thought to be when the concept was first introduced and estimated in the 1930s. One reason is a substantial structural change in democratic capitalist economies. Governments are much larger relative to private sectors than before World War II, and their fiscal institutions are "built-in stabilizers." Their expenditures are quite unresponsive to current business conditions, while their revenues (net of transfers to the private sector) are cyclically sensitive and thus moderate swings in private incomes. A second reason is that economists have come to recognize that, thanks to accommodating capital markets as well as to their own foresight, most economic agents have horizons longer than one year.

While this consideration implies that multipliers of transient shocks are lower than for permanent changes, it by no means implies that they are zero. Both consumption and investment appear to be sensitive to contemporaneous and recent incomes. For most agents capital markets are far from perfect; in particular future and current labor incomes are not fungible. Moreover,

expectations of economic futures, individual, national, and global, are influenced by current events, perhaps to an irrational extent.

As Keynes explicitly observed, his theory refers to economies with incomplete markets. In his day futures markets were rare, and contingent futures markets even rarer. They are still scarce. As Keynes explained, decisions not to spend now are not coupled with any definite orders for future or contingent deliveries. Typically they result in accumulations of assets that can be spent on anything at any future time. The multiplier effects of lower current spending propensities are not offset by specific and firm expectations of higher future demands.

Business Cycles as Demand Fluctuations

According to Keynesian macroeconomics, business cycles are fluctuations in aggregate effective demand, carrying output and employment in their wake. They do not reflect movements in market-clearing supply–equals–demand equilibria.

Supplies of labor and other factors of production move fairly smoothly from year to year and from cycle to cycle. So does economy-wide factor productivity, largely reflecting technological progress. Equilibrium output and employment cannot be as variable as actual cyclical observations. In the neoclassical neo-Keynesian synthesis, trend growth is supply-determined; markets are cleared; supply truly creates its own demand. In cyclical departures from trend, demand evokes its own supply. Keynesian short-run macroeconomics does not pretend to apply to problems of long-run growth and development.

Equilibrium cycle theories (Plosser, 1989) are unconvincing. They rely on incredible volatility in technology, retrogressive as well as progressive. They rely on extreme intertemporal substitutions among work, leisure, and consumption. Or they contrive informational asymmetries and misperceptions that seem easy to correct. For example, a few years ago a popular theory attributed business cycles to confusions by suppliers of products and labor between increases in their own real prices, on the one hand, and economy-wide inflation, on the other. Evidently businesses and households were assumed to ignore the flood of current statistics on prices and money supplies.

I am using the word equilibrium to mean Walrasian market-clearing by prices, as is the current usage of both new classical macroeconomists and disequilibrium theorists. Keynes used it otherwise, to refer to a position of rest. That is why he referred to outcomes with involuntary unemployment as equilibria on a par with full employment, and why he termed his theory "general" in the title of his book. The basic issue is not semantic. It is whether situations of general excess supply can and do exist for significant periods of time, whether or not they are called equilibria.

Some passages of *The General Theory* can be read to assert that involuntary unemployment is much more than a temporary cyclical phenomenon, that it is in the absence of remedial policies a chronic defect of capitalism. This was a natural enough view in the 1930s. In Alvin Hansen's American Keynesianism (e.g., Hansen, 1938) secular stagnation was a central proposition. Formally, however, the analysis of *The General Theory* is limited to a time period short enough that the changes in capital stock resulting from non-zero investment can be ignored.

Postwar Keynesians, for the most part, have not regarded protracted depression as a likely outcome.[1] Chronic inflationary gaps could also occur, and alternations between excess-supply and excess-demand regimes were highly probable. Keynesian macroeconomics is two-sided. Deviations on both sides of Walrasian market-clearing can occur, though not necessarily with symmetrical symptoms. Excess demand in aggregate is mainly an "inflationary gap," generating unfilled orders and repressed or open inflation, rather than significant extra output and employment. Macroeconomic stabilization requires two-sided countercyclical demand management.

In any case, habitual application of Keynesian remedies reinforces whatever natural mechanisms tend to return the economy to its full employment growth path. Expectations that those remedies will be used contribute to the stability of that equilibrium path.

The Efficacy of Classical Adjustment Mechanisms: Interest Rates

Suppose that shocks to current real demands for goods and services create, at existing prices and wages, excess supplies of labor and capital services. What are the variables whose changes would avert or eliminate macroeconomic disequilibrium? The leading candidates are current prices, which include both wages of labor as well as prices of products, and interest rates, which involve future as well as current prices. In what follows, I shall set forth Keynesian skepticism regarding the efficacy of these classical adjustment mechanisms.

If these mechanisms respond instantaneously to shocks, no actual discrepancy between demand and supply will occur or be observed. The shocks will be wholly absorbed in the market-clearing variables. This is the assumption of equilibrium business cycle theory and of the "real business cycles" approach. It is this assumption that, among other things, enables new classical macroeconomists to dismiss out of hand real aggregate demand shocks and to react

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[1]In Tobin (1955), stagnation is one possibility, the stable solution of a non-linear model whose unstable solution is a repetitive cycle.

with incredulity when Keynesians mention them. However, if these adjustments do not occur instantaneously but take real time, then Keynesian situations of excess supply do occur. They occur even if prices and interest rates are falling at the same time. The consequence is that the quantity adjustments of the multiplier process start working counter to the possible equilibrating effects of interest rate and price reductions.

In standard Walrasian/Arrow-Debreu theory, perfect flexibility of all wages and prices, present and future, would maintain full employment equilibrium. Short of that, an old question of macroeconomic theory is whether, given current nominal wages and prices, changes in future money wages and prices —that is, in nominal interest rates—could do the job.

In old classical macroeconomics, interest rates are the equilibrators of both capital markets and goods markets. Their adjustment is crucial to the Say's Law story, which dismisses as vulgar superficiality notions that an economy could suffer from shortfalls in demand for commodities in aggregate. Market interest rates keep investment equal to saving at their full-employment levels—and therefore keep aggregate demand equal to full employment output—even if nominal product prices and wages stay put. Indeed classical doctrine is that the real equilibrium of the economy is independent of nominal prices, as if it were the outcome of moneyless frictionless multilateral Walrasian barter.[2]

Can interest rates do the job? The Keynesian insight is that the institutionally fixed nominal interest rate on currency, generally zero, limits the adjustment of nominal interest rates on non-money assets and imparts to them some stickiness even when they are above zero. As a result, after an aggregate demand shock they may not fall automatically to levels low enough to induce sufficient investment to absorb full employment saving. As a result, aggregate demand—consumption plus investment—will fall short of full employment supply.

The case for significant non-zero interest elasticity of money demand is simply that the opportunity costs of holding money fall as the interest rates available on non-money substitutes decline. As those rates approach the interest paid on money itself, zero at the lowest, the opportunity costs vanish. The interest rate on money sets the floor for other nominal market interest rates. The familiar specific money demand models—transactions costs, risk aversion, regressive interest rate expectations—all depend on the fixed nominal interest floor.

The interest-elasticity of money demand is a key parameter in macroeconomic theory. Three cases can be distinguished. One is a classical extreme, often associated with the quantity theory of money: the elasticity is zero. At the other extreme is the Keynesian liquidity trap: market interest rates are so close to the floor that people are on the margin indifferent between money and

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[2]Dudley Dillard (1988) calls this the "barter illusion" of classical economics.

other assets. In between is the vast middle ground, where the interest-elasticity of money demand is somewhere between zero and negative infinity. Undergraduate students of macroeconomics know, or used to know, that in standard models monetary policy can effectively alter spending in the classical and intermediate cases but not at the liquidity trap extreme. They also know, or used to know, that fiscal policy is effective in the liquidity trap and intermediate cases but not at the classical, monetarist extreme.

My focus here is somewhat different. The question is the efficacy of market interest rates as automatic stabilizers in the face of real demand shocks, when monetary quantities, fiscal parameters, and other policy instruments are fixed. The answer is not in dispute for the two extremes: they work in the classical case and not in the liquidity trap. Who owns the middle ground? Quantity theorists used to contend that classical propositions obtain everywhere outside the liquidity trap. But the middle ground belongs to the Keynesians. Real demand shocks will move aggregate income despite their effects on interest rates, for the same reason that fiscal policies will do so. Unless the real supply of money is increased by monetary policy or by price reduction, the interest rate will not fall enough after a negative aggregate demand shock (the same thing as a negative investment-minus-saving shock) to maintain investment–equals–saving equality at full employment. The interest rate that would do that job would also require additional money supply—unless money demand is perfectly inelastic with respect to market interest rates.

Recent structural changes have made the monetary system more monetarist, more like what the quantity theorists said it always was. Bank deposit interest rates, even on the checkable deposits used for most transactions, now are market-determined and move up and down along with rates on non-money assets. The differential between them, the opportunity cost important in cash management, is less systematically related to the general level of interest rates than it used to be. This development has undoubtedly made the demand for deposits less elastic with respect to the interest rates that matter for demands for goods and services. (On these developments see Tobin, 1983).

However, the zero floor on nominal interest rates is still there. The monetary base, currency held outside banks plus bank reserves, remains interest-free. The money market in which the demand for and supply of bank reserves are equated is the fulcrum of the banking system and of the entire structure of interest rates. States of nature in which equilibrium would require negative real interest rates still have positive probability. Since nominal rates cannot be negative, full employment would not be possible in those contingencies unless expected inflation made real rates negative. The possibility of these states will influence the portfolio and investment decisions of rational agents.

Money demand is not the whole story. Keynes also stressed liquidity preference in a different form, sticky long-term interest rates. Because traditional expectations of future long rates persist in slumps, current long rates do

not automatically follow short rates down far enough to induce the spurts in investment needed for recovery.

Classical and new classical theories assert that capital markets generate equilibrium real rates independently of what is happening to nominal interest rates and commodity prices. But the evidence is that nominal interest rates do matter. Changes in them are usually changes in real rates. Likewise changes in inflation expectations are not fully offset by changes in nominal rates. The "Fisher equation" asserts that real interest rates are independent of nominal rates and inflation expectations, but Irving Fisher himself concluded from his empirical investigations that the proposition held if at all only in very long runs. Modern research has confirmed his findings.

The Efficacy of Classical Adjustment Mechanisms: Nominal Wages and Prices

If interest rate adjustments cannot suffice, no matter how rapidly asset markets clear, the job falls to nominal prices. If it is a crime not to accept the instantaneous clearing by prices of product and labor markets as the foundation of macroeconomics, then Keynes and Keynesians are certainly guilty. But it is a caricature of Keynesian economics, no less false because it is widely believed, to attribute to Keynesians the assumption that nominal prices are perfectly rigid, for the entire time period over which the analysis is intended to apply. In fact Keynes himself did not contend that nominal prices and product prices are fixed independently of amounts of excess supply or demand, and neither do most Keynesians today.

The "fixprice" method used in many textbooks was a convenient device for expounding the Keynesian calculus of adjustments of quantities to quantities and to interest rates. It was carried to extreme in modern formal "disequilibrium theory." The method is misleading when it conveys the impression that Keynesian economics assumes price rigidities and indeed is defined by that assumption. It is especially misleading if it gives the idea that such an assumption is necessary. This impression of Keynesian theory, whether the result of caricatures by its enemies or careless expositions by its friends, appears to be the source of the defection of many economists.

Consider a spectrum of the degree of nominal price flexibility from complete flexibility at one extreme to complete rigidity at the other. Complete flexibility means instantaneous adjustment, so that prices are always clearing markets, jumping sufficiently to absorb all demand or supply shocks. Complete rigidity means that nominal prices do not change at all during the period of analysis. In between are various speeds of price adjustment, various lengths of time during which markets are not clearing. Here again, as in the case of

interest rate effects and despite common beliefs to the contrary, Keynesians own the middle ground. It is not true that only the arbitrary and gratuitous assumption of complete rigidity converts nominal demand shocks into real demand shocks and brings multipliers and IS/LM processes into play. Any degree of stickiness that prevents complete price adjustment at once has the same qualitative implications, and can even be treated by the fixprice method on an "as if" basis.

Keynes argued that nominal wage would not fall rapidly in response to excess supplies of labor. At the same time, he asserted that real wages could fall if product prices rose as necessary to induce firms to expand employment. This asymmetry led many critics to suppose that Keynes was attributing "money illusion" to workers and to dismiss Keynesian theory out of hand. Why would workers accept a cut in *real* wages achieved by an increase in the price of wage goods but resist cuts in money wages? Keynes' reason for this asymmetry is both empirically realistic and theoretically impeccable. Workers are concerned primarily with relative wages, with how their pay compares with the pay of those to whom they regard themselves at least equal in merit. Those concerns do not depend on money illusion, they are certainly not irrational, and there is a great deal of empirical evidence of their importance.

Labor markets are disaggregated and desynchronized. To any single worker or local group, a nominal wage cut appears to be a loss in relative wages; there is no assurance that others will also take cuts. On the other hand, an increase in the cost of living is the same for everybody. Workers may be perfectly prepared to receive lower real wages with unchanged relative wages, but labor market institutions give them no way to communicate this willingness.

The hole in this story is that it does not explain how the relative-wage concerns of employed workers prevail when there are unemployed workers willing to work for less pay—real, nominal, and relative. The power of insiders vis-a-vis employers and outsiders evidently derives from the costs of turnover among members of an interdependent working team. Insider power has lately been the subject of considerable theoretical and empirical inquiry, notably by Assar Lindbeck and his colleagues (Lindbeck and Snower, 1990). Labor economists have long observed that queues of jobseekers outside the factory gate have little effect on the wages paid to employees inside. Hard times do bring wage cuts, but usually by so damaging the financial and competitive positions of employers that they can credibly threaten layoffs of senior workers and even plant closings and bankruptcies.

All Keynesian macroeconomics really requires is that product prices and money wages are not perfectly flexible, whatever may be the rationale for their behavior. After all, the Walrasian auctioneer of classical macroeconomics is itself not an implication of optimizing behavior. It is a fictitious institution with no presumptive priority over alternative institutional assumptions.

Seeking to win the game on his opponents' home field, Keynes pretended to be assuming pure competition in all markets. But his insights regarding

labor markets implicitly recognized that wages are administered or negotiated prices, and for that reason alone are not perfectly flexible, not prices set in impersonal auction markets. His product markets, however, remained Marshallian. Given money wages and given the overall aggregate demand constraint, competition equated product prices to marginal cost. Thus real wages were equal to marginal productivity. But, as the existence of excess supply would imply, those wages exceeded the wages necessary to induce workers to supply the actual volume of employment.

Marginal productivity theory implies that real wages and employment or output would be negatively correlated in business cycles. But this implication has been repeatedly refuted by empirical observations. This is not a blow to Keynesian policy recommendations, quite the contrary. If it is possible to expand demand and increase output and employment without lowering real wages, so much the better—there is less reason to worry that observed unemployment may be classical.

Clearly product markets, as well as labor markets, should be modeled as imperfectly competitive. There too prices are decision variables, a fact that at the very least suggests that they don't change every hour. When the economy is in a Keynesian excess-supply regime, dynamics of adjustment determine the paths of wages, markups, and product prices. The path of real wages lies between the classical labor demand the supply curves, and could be either pro-cyclical or counter-cyclical. Likewise, the paths of output and employment typically diverge from production functions. In the past 50 years a great deal of empirical work has been done on these relationships. Phillips curves and Okun's law are among the best known examples.

In addition, more formal models of nominal price inertia have been developed. Arthur Okun (1981) provided a theory of "invisible handshakes," in which price adjustments are moderated in the interest of maintaining long-run customer-supplier relationships. Stanley Fischer (1977) and John Taylor (1980) formalized wage stickiness in models of overlapping staggered contracts. These models can apply even to non-union shops where wages are administered rather than negotiated; employers with large work forces change announced wage scales periodically. In a monograph that has attracted too little attention, Katsuhito Iwai (1981) gave Keynesian macroeconomics rigorous microfoundations in a model of monopolistic competition. A microeconomic world of imperfect competition is a Keynesian macroeconomic world, where nominal prices are imperfectly flexible.

Keynes' explanation of money-wage stickiness is the usual focus of discussion and criticism. It is to the second strand of his argument, commonly ignored, that I wish to direct major attention. Even if money wages and prices were more flexible, even if excess supplies of labor were to lead more rapidly to cuts in money wages, this greater flexibility would not prevent or cure unemployment. Given a contractionary shock in aggregate demand, deflation of money wages and prices would not restore real demand to its full employment

value. This classical market-clearing adjustment mechanism was, in Keynes' view, much too frail to bear the weight of macroeconomic stabilization. In fact, Keynes recommended stability rather than flexibility in money wages.

Keynes did not challenge the efficacy of price adjustment mechanisms in clearing particular markets in the Marshallian partial equilibrium theory on which he had been reared. He did challenge the mindless application of those mechanisms to economy-wide markets. Founding what came to be known as macroeconomics, he was modeling a whole economy as a closed system. He knew he could not use the Marshallian assumption that the clearing of one market could be safety described on the assumption that the rest of the economy was unaffected.

Consider the difference between a local market for a particular kind of worker and the national market for all labor. Excess supply in the local printing trades, for example, would in a competitive market cause printers' wages to fall. Declining nominal wages would be declining real wages; both would be falling relative to the rest of the economy. The adjustments themselves would not have any noticeable effects on local printing firms' schedules of demand for printers or on workers' supply schedules. But suppose there is an economy-wide excess supply of labor. How is the conventional adjustment apparatus to be deployed?

The orthodox instinct is to think of the price in this market as the real wage. It is in terms of the real wage that the employers' downward sloping demand schedule, following the law of diminishing marginal productivity, is expressed. In the same terms are expressed workers' marginal choices between the consumption rewards of paid employment and the utilities of other uses of time. The orthodox expectation and prescription is that real wages fall to eliminate unemployment.

But, Keynes asks, how do workers and employers engineer an economy-wide reduction in real wages? The unemployment is nation-wide, but the markets where wages are set are decentralized. In every local market it is the money wage, not the real wage, that is determined. If money wage rates fall in all these excess-supply local labor markets, will real wages in fact fall?

It is certainly far from obvious. The relevant labor demand curves are the nominal values of marginal products. These values will fall, the demand curves shift down, if and as product prices fall. Product prices will fall because nominal labor incomes decline along with wage rates; as a result, workers' money demands for the products they produce will decline too. Here, then, is a case in which demand and supply schedules do not stay put while the price adjustment to excess supply takes place. It is illegitimate to appeal to the intuition that seems so credible for single markets. Instead, the question is whether proportionate deflation of all nominal prices will or will not increase aggregate effective real demand.[3]

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[3] In formal general equilibrium theory the stability of markets determining relative prices cannot be guaranteed without special assumptions. This is *a fortiori* true if money is introduced and markets determine nominal prices. See the survey by Franklin Fisher (1987).

Two issues in this debate need to be distinguished. The first concerns the relation of real aggregate demand to the *price level*. The second concerns its relation to the expected *rate of change* of prices. In discussing them, I shall not distinguish between money wages and nominal product prices or between their rates of change, but rather follow the assumption, conventional in this debate, that they move together. I remind you that the theoretical argument refers to a closed economy—maybe the United States in years gone by, or post-1992 Europe, or the whole OECD area.

Keynes in Book I of *The General Theory* denied that real aggregate demand was related at all to the price and money wage level. In effect, he turned the classical neutrality proposition against the classicals. If all money wages and prices are lowered in the same proportion, how can real quantities demanded be any different? Thus, if a real shock makes real demand deficient, how can a purely nominal price adjustment undo the damage?

Actually Keynes himself provided an answer in Chapter 19. If the nominal quantity of money remains the same, its real quantity increases, interest rates fall, and real demand increases. This scenario is often called the "Keynes effect." This mechanism would fail if demand for money became perfectly elastic with respect to interest rates—as in the liquidity trap discussed above—or if demand for goods for consumption and investment were perfectly inelastic.

Pigou (1943, 1947), Patinkin (1948, 1956 [1965]), and other authors provided another scenario, the "Pigou effect" or "real balance effect," which alleges a direct effect of increased wealth, in the case at hand taking the form of the increased real value of base money, on real consumption demand (possibly also on investment demand as wealth-owners seek to maintain portfolio balance between real and nominal assets). This effect does not depend on reduction of interest rates.

To an astonishing degree, the theoretical fraternity has taken the real balance effect to be a conclusive refutation of Keynes. Perhaps it does refute his claim to have found underemployment *equilibria*. If involuntary unemployment and excess capacity are pushing nominal wages and prices down, the economy is not in equilibrium in any sense. It is not in a position of rest, markets are not clearing, and expectations are not being realized. Equilibrium requires wages and prices so low that the purchasing power of net monetary wealth is so great that aggregate real demand creates jobs for all willing workers. In principle, as Leontief observed, prices could be low enough to enable you to buy the whole GNP for one thin dime.

Nevertheless the real balance effect is of dubious strength, and even of uncertain sign. Most nominal assets in a modern economy are "inside" assets, that is the debts of private agents to other private agents. They wash out in accounting aggregation, leaving only the government's nominal debt to the private sector as net wealth. Some, though probably not all, of that debt is internalized by taxpayers. The base of the real balance effect is therefore quite small relative to the economy—in the United States the monetary base is

currently only 6 percent of GNP. A 10 percent increase in the value of money would increase net wealth by 0.6 percent of GNP and, if the marginal propensity to spend from wealth were generously estimated at 0.10, would increase spending by 0.06 percent of GNP.

While Don Patinkin (1948) stressed the theoretical importance of the real balance effect, he disclaimed belief in its practical significance. In the Great Depression, he pointed out, the real value of net private balances rose 46 percent from 1929 to 1932, but real national income *fell* 40 percent.

That inside assets and debts wash out in accounting aggregation does not mean that the consequences of price changes on their real values wash out. Price declines make creditors better off and debtors poorer. Their marginal propensities to spend from wealth need not be the same. Common sense suggests that debtors have the higher spending propensities—that is why they are in debt! Even a small differential could easily swamp the Pigou effect—gross inside dollar-denominated assets are 200 percent of United States GNP.

Irving Fisher (1933) emphasized the increased burden of debt resulting from unanticipated deflation as a major factor in depressions in general and in the Great Depression in particular. Therefore, I like to call the reverse Pigou-Patinkin effect the Fisher wealth redistribution effect (not to be confused with other Fisher effects). It is quite possible that this Fisher effect is stronger than the Pigou and Keynes effects combined, particularly when output and employment are low relative to capacity.[4]

Aggregate Demand and the Rate of Change of Prices

The previous argument refers to *levels* of nominal wages and prices. An even more important argument refers to *rates of change*. The Keynes and Pigou effects compare high prices and low as if they were timeless alternatives, without worrying about the process of change from high to low in real time. Economists of their day argued in this way quite consciously, as dictated by the rules of the comparative statics games they were playing.

The process of change works on aggregate demand in just the wrong direction. Greater expected deflation, or expected disinflation, is an increase in the real rate of interest, necessarily so when nominal interest rates are constrained by the zero floor of the interest on money. Here is another Fisher effect, another factor Fisher stressed in his explanation of the Great Depression. Keynes stressed it too, as a pragmatic dynamic reinforcement of the lesson of his static general theory.

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[4]I have exhibited a dominant Fisher effect and examined its macroeconomic consequences in an IS/LM model that also has a Keynes effect, in Tobin (1980, Chapter 1). See also Caskey and Fazzari (1987).

Figure 1
The Problematic Stability of Price Adjustment
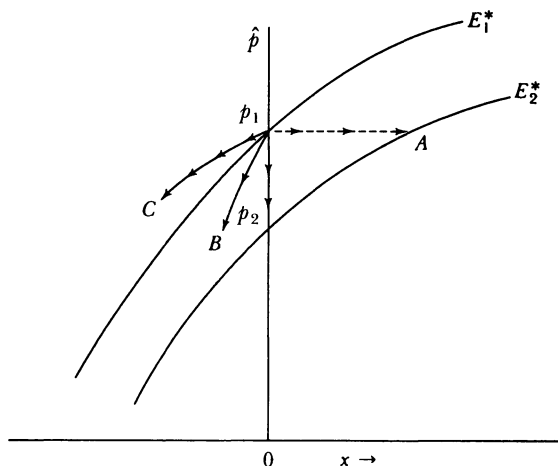
The problematic stability of price adjustment is evident in Figure 1. Here the horizontal axis represents expected price deflation or inflation, x. The vertical axis represents p the log of the price level. An upward sloping curve like E_1^* plots combinations (x, p) of expected price change and price level that generate the same aggregate real demand E. The slope reflects the assumptions that demand is related negatively to the price level and positively to its expected rate of change. In given circumstances, a higher curve refers to a lower demand E and a lower curve to higher demand. The curvature of the E^* loci reflects the assumption that the "Keynes effect" of increases in real money balances in lowering interest rates declines as those balances increase and interest rates fall.

Suppose that initially the "isoquant" E_1^* makes demand equal to full employment equilibrium output Y^*, here taken to be constant. Points above or left of that isoquant are positions where E is lower than Y^*, characterized by Keynesian unemployment. Points below or right of E_1^* are positions of macroeconomic excess demand. In Figure 1, the equilibrium inflation rate (expected and actual) and price are $(0, p_1)$. Suppose now that a discrete one-time negative shock to real demand shifts the isoquant for $E = Y^*$ down to E_2^* so that the new equilibrium inflation rate and price are $(0, p_2)$. The old isoquant E_1^* now implies an E lower than Y^*. To restore equilibrium the price level must fall from p_1 to p_2. How is the price decline to be accomplished? One scenario is the Walrasian miracle, an instantaneous precipitous vertical descent, so that there is no time interval during which actual or expected price changes are other than zero. If jumps of that kind in p are excluded, there is no path of actual price changes and rationally expected prices that avoids departure from $E = Y^*$ during the transition. It would take a burst of positive inflation, actual and expected, to offset the negative demand shock, as at point A. But this would move the price level in the wrong direction.

The likely scenario is a path like B or C in Figure 1: The excess supply that now characterizes the initial equilibrium point $(0, p_1)$ and the first isoquant starts prices declining, and the anticipation of their decline is bad for aggregate demand. Along B the real balance effect is strong enough to overcome the negative effects of the deflation; aggregate demand E is increasing as the path hits lower isoquants. The new equilibrium may be attained, though probably by a damped cyclical process. Along C, however, the price level effect is too weak to win out, and the gap of E and Y below Y^* is increasing.

Fisher and Keynes were right. In Tobin (1975), I exhibited a simple formal macroeconomic system, classical in the sense that it has only one equilibrium, which is characterized by full employment, indeed by a "natural" rate of unemployment. Given a zero natural real growth rate and a constant nominal monetary base, the price level is constant in that equilibrium.

Several specifications of the short-run dynamics of this model are possible. One is a Keynesian specification, as follows: (1) Production increases when desired purchases exceed actual current output, but not by the full amount of the gap. This adjustment can be thought of as response to undesired changes in inventories or unfilled orders. (2) Nominal prices follow expectations plus or minus a "Phillips curve" adjustment to the difference between actual and full employment output. (3) Price change expectations adapt to the difference between actual and expected inflation or deflation.

Alternatively, the price change expectations could be regarded as rational expectations of the Phillips curve price adjustment mechanisms. That is, the impossibility of instantaneous jumps to the new equilibrium would be as intrinsic to the structure of the system as the system's static equations themselves.

The stability of this system requires, first, that the dynamics of output at constant prices, involving marginal propensities to spend and adjustments to excess or deficient inventories and other manifestations of demand/output gaps, is stable. Assuming this condition is met, stability depends on the relative strengths of the price level effects on demand—both "Keynes" and "Pigou" as modified by "Fisher wealth redistribution"—and the real interest effect— another "Fisher"—of expected deflation (or disinflation). The latter is the product of two coefficients, the response of price change expectations to actual change (equal to one if expectations are rational) and the response of real demand to expected price change. The real interest effect may well dominate if the real balance effect is weak, especially if the Fisher wealth redistribution effect overshadows it, and if the demand for money is highly sensitive to interest rates. The equilibrium is then unstable. Moreover, because of the curvature of the E^* loci, the system could be stable locally but unstable for large displacements.

I have experimented with simulations of a discrete-time approximation to this model, subjecting it to stochastic shocks to real aggregate demand. One extreme case is "Walrasian": prices vary from period to period as necessary to

keep goods markets always cleared, prices are always anticipated to equal their expected value corresponding to zero shock, and both output and aggregate demand always equal equilibrium full employment output. An opposite extreme is "rigid-price Keynesian:" prices are constant at their expected equilibrium value and expectations of price change are constant at zero. In between the extremes, nominal prices adjust with some inertia to excess real demand or supply, and expectations of price change adapt, more or less speedily, to observed changes.

In these simulations the underlying "fixprice" dynamics are stable, and its parameters are the same in all cases. "Greater price flexibility" can mean two things: (1) a larger Phillips curve coefficient relating price change to excess real demand or supply; (2) if expectations are taken to be adaptive, a larger coefficient of adaptation of price change expectations to actual price changes.

The issue is whether greater price flexibility increases or decreases the ratio between the standard deviation of the actual output gap and the standard deviation of the stochastic real demand shock. That ratio is zero in the Walrasian case, where the shock is always wholly absorbed in prices. It is of course positive for the rigid-price case. What happens in the intermediate cases? Not surprisingly, the results depend mainly on the same condition that determines stability or instability with respect to a single unrepeated shock. Greater flexibility in sense (1), a faster "Phillips" adjustment, diminishes the test ratio when the stability condition is met—that is, the price level effect on demand is negative and bigger than the price change effect—and raises it otherwise. Greater flexibility in sense (2), faster adjustment of price expectations, always raises the test ratio.[5]

Policies, Expectations, and Stability

Keynes stressed the central role of long-term expectations. He had in mind in particular expectations of real variables—effective demands and real returns on investments. They might be either stabilizing or destabilizing. If business managers believe that recessions will be quickly reversed, their actions will help to bring about recoveries. If they expect business activity to continue to be subnormal or to fall further, their pessimism may turn recession into depression. That is why policies and policy expectations are very important. After World War II, widespread perception that government fiscal and monetary

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[5]At long last the question whether price flexibility (in any sense short of the Walrasian auctioneer fairy tale) is stabilizing has begun to receive considerable attention. De Long and Summers (1986) have investigated this question using the Fischer-Taylor staggered-contract model (Fischer, 1977; Taylor, 1980), amended to allow both price-level and price-change effects on demand. Their most interesting simulation has the intuitively desirable property that close to the limit of perfect price flexibility greater price flexibility means greater real stability, while farther away from it the reverse is true. Similar results are obtained by Caskey and Fazzari (1988) and Chadha (1989).

policies would keep recessions short and shallow helped to keep them short and shallow. In these circumstances, the economy would work well if, as Keynes advocated, employers and workers kept average money wage rates stable, so that actual and expected price and wage changes were not a source of instability.

In the 1930s both Fisher and Keynes saw deflation as a cause of depression in production and employment, and advocated monetary and gold policies of reflation for recovery. Today, however, unexpectedly high prices are regarded as bearish economic news, and unexpectedly low prices as bullish. Is this a paradox? Does it mean that price flexibility is stabilizing after all? Again, policies and policy expectations are crucial. Today the public understands the high priorities central banks attach to inflation control. If prices are above the path to which the central bank is committed, it will take measures to contract demand. The faster private agents respond by lowering prices and wages, the sooner the monetary authorities will reflate. In this sense, price flexibility is stabilizing.

In contrast, extrapolative expectations are destabilizing. Policies—policy rules if you like—that create and sustain regressive expectations of output and price departures from equilibrium are stabilizing. Those facts are wholly consistent with the contentions of Fisher and Keynes, and of this paper, that in the absence of activist "feedback" policies, monetary and fiscal, flexibility may well be destabilizing, both to prices and to real macro variables. Governments and central banks should not expect disinflation or deflation alone to maintain or restore full employment.

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