

Hayek and Friedman: Head to Head

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In the grand battle of ideas, F. A. Hayek and Milton Friedman were, at the same time, soul mates and adversaries. Hayek's *Constitution of Liberty* (1960) and Friedman's *Capitalism and Freedom* (1962) are rightly seen as companion volumes. By contrast, Hayek's *Monetary Theory and the Trade Cycle* ([1928] 1975) and Friedman's *Optimum Quantity of Money and Other Essays* (1969) are worlds apart. The tenets of classical liberalism unite these two thinkers; the methods and substance of their economics, particularly the economics of money and business cycles, divide them. A thorough understanding of both the common ground and the battle ground requires attention to several different fields of study, including philosophy of science, methodology, political economy, and economics. The comparison is facilitated by a wealth of literature produced by Hayek and Friedman as well as a voluminous and still-growing secondary literature aimed at reconciling the differences or at sharpening them.¹ But sorting it all out requires careful attention to the changing views of these two leaders of their respective schools of thought and to the various contexts in which particular arguments were made.

Hayek's own characterizations of the relationship between his views and those of Friedman are sometimes less than helpful. In a mid 1980s interview conducted by W. W. Bartley III, for instance, Hayek (1994, p. 144) claimed that "Milton and I agree on almost everything except monetary policy." A full accounting of their actual differences could well take the form of identifying all the ways in which this claim is wrong or misleading. Differing views about monetary policy follow directly from the more fundamentally differing judgments about the macroeconomic significance of money in a market economy.

¹ Enduring or renewed interest in this comparison of ideas is evidenced by Mark Skousen's *Vienna & Chicago: Friends or Foes* (2005) and by Lanny Ebenstein's separate biographies of *Friedrich Hayek* (2001) and *Milton Friedman* (2007).

Hayek theorized in terms of the market process that governs relative prices. His macroeconomic theorizing focused especially on the rate of interest, which, broadly conceived, reflects the pattern of prices of consumer goods and various categories of capital goods. Monetary expansion can disrupt the market process, causing resources to be misallocated.

Friedman focused on the strong relationship between changes in the monetary aggregates and subsequent movements in the overall level of prices—as demonstrated statistically during the heyday of monetarism for many economies and for many time periods. With possible effects on resource allocation considered to be at most a secondary issue, the empirical findings bolster the claim that the long-run effect of monetary expansion is overall price-and-wage inflation.

The differing orientations—theoretical for Hayek and empirical for Friedman—reflect a fundamental difference in methodological precepts. While actually allied on many policy issues (including even monetary policy when their policy recommendations are constrained by considerations of practicality and political viability), Hayek and Friedman are radically at odds with one another about the very nature of the requisite analytical framework.

The difficulties of comparing Hayek and Friedman get compounded by Hayek's prescription for monetary policy. A decade before he suggested that monetary policy was the primary basis for their disagreement, his own policy recommendations were almost indistinguishable from Friedman's. In a lecture delivered in Rome in 1975, Hayek (1978, p. 208) agreed that "we will have to try to get back to some more or less automatic system for regulating the quantity of money." He suggested that the rate of monetary growth should be reduced to match "the rate of real growth of production" (p. 206). His only reservations about adopting such a monetary rule were based on (1) doubts that the money supply was sufficiently well defined to make the rule practicable and (2) belief that the monetary authority should have some discretion in order to deal with liquidity crises.² The first reservation is one that came to haunt monetarism starting in the early 1980s when monetary reforms in the US (including the phasing out of Regulation Q) blurred the distinction between money and savings. The second reservation, which reflects concerns about significant variations in money demand, suggests a deviation from monetarism in the direction of Keynesianism.

² In his early writings, Hayek ([1928] 1984) had suggested that, as a policy ideal, the product of money and its velocity of circulation, i.e. MV , should be kept constant. The constant product implies that M should be varied to offset any variation in V . This aspect of the policy is aimed at dealing with liquidity crises. But the rule also implies the increased economic output should be accommodated by a declining price level. That is, a constant PQ that matches the constant MV requires that P and Q must move in opposing directions. The apparent difference here between the early and late Hayek, i.e., between a recommended constancy MV and a recommended increase in M to match the increase in Q , does not constitute a change of mind but rather is a difference between Hayek's notions of ideal policy and practical policy. See Garrison (1985).

But largely because of his attention to the market process and relative prices, Hayek was critical of Keynesian theory from the beginning. Keynes's macroeconomic aggregates, such as investment, consumption, income, and employment, tend to mask more than they reveal. One regret that Hayek often expressed is that he failed to review Keynes's *General Theory* (1936).³ Undoubtedly, Keynes's methods and especially his neglect of relative-price considerations would have been Hayek's focus. But there was also regret for not having reviewed Friedman's *Essays in Positive Economics* (1953), "which in a way," according to Hayek, "was quite as dangerous a book." (Hayek, 1994, p. 145).

It is curious that Hayek's "dangerous-book" remark was part of the same response in which he expressed nearly complete agreement with Friedman (except for monetary policy). In another interview (by Leo Rosten in Hayek, 1983, p. 95), Hayek criticized Friedman for concentrating too much on statistical relationships (between the quantity of money and the price level), claiming that matters are not quite that simple. Nonetheless, he indicated that for all practical purposes, he and Friedman were "wholly on the same side." Here Hayek qualified this claim only with the parenthetical remark, "our differences are fine points of abstruse theory."

Friedman's account of his differences with Hayek puts the "fine points of abstruse theory" into perspective: "I am an enormous admirer of Hayek, but not for his economics. I think *Prices and Production* (1935) is a flawed book. I think his capital theory book [*The Pure Theory of Capital* (1941)] is unreadable. On the other hand, *The Road to Serfdom* (1944) is one of the great books of our time" (Ebenstein, 2001, p. 81) In Friedman's view, the alliance is based on their adherence to the principles of classical liberalism; their economics—and especially their macroeconomics—is quite another matter.

Opposing Views about "The Right Kind of Macroeconomics"

Hayek's early work on capital theory was, in the first instance, an exercise in microeconomics with special attention to the market economy's temporal dimension. The Hayekian triangle, as it came to be called, was introduced in his 1931 LSE lectures (which became *Prices and Production*) as a highly stylized depiction of the economy's time structure of production. Hayek demonstrated just how the allocation of resources among the temporally sequenced stages of production can be guided by the price system. Changes in people's preferred pattern of consumption over time, as registered by their saving behavior, get translated through the price system—and especially through interest-rate movements—into an altered pattern of investment among temporally sequenced

³ See Caldwell (1998) for an assessment of the various reasons that Hayek offered for his not reviewing Keynes's book.

stages of production. In a well functioning economy, investment decisions in the current period will not be systematically at odds with people's current saving propensities or with their future demands for consumption goods. His account of how markets work to coordinate production decisions with consumer preferences is an exercise in price theory—i.e., in microeconomics. But it is foundational, in Hayek's view, to any subsequent theorizing about macroeconomic issues of boom and bust.

Long before the search for microeconomic foundations was added to the agenda of modern macroeconomics, Hayek (1935, p. 127) insisted that price theory is a strict prerequisite to monetary theory, business cycle theory, and, it might be added, to macroeconomics in general: the "task [of monetary theory] is to cover a second time the whole field which is treated by pure theory under the assumption of barter, and to investigate what changes in the conclusions of pure theory are made necessary by the introduction of indirect exchange." The mere statement of this agenda for monetary theory (and for macroeconomics) seems to command assent—with only one point of clarification. The broader context in which this mission statement appears suggests that his reference to "barter" as an assumption that underlies "pure theory" is unnecessarily strong—even to the point of being misleading. His "pure theory" is simply value theory, or price theory, which assumes away *not* money itself but rather all *problems* that might originate from the sphere of money. Monetary theory, then, beyond the accounting of money's evolution and of its essential role in facilitating exchange, is concerned with the problems that stem from breaking the direct links between supplying and demanding. Money, that is, puts some slack in the price system, allowing for the possibility of economywide disequilibrium conditions that can persist for some time.

In Hayek's *Pure Theory of Capital* (1941, p. 408), the potential for problems arising in the monetary sphere are attributed to money's status as a "loose joint": "money by its very nature constitutes a kind of loose joint in a self-equilibrating apparatus of the price mechanism which is bound to impede its working—the more so the greater play in the loose joint." By implication, pure theory assumes a tight joint. The introduction of this tight/loose distinction in the closing pages of Hayek's otherwise "pure theory" facilitated a summary assessment of Keynes's loose-joint theorizing: "the existence of such a loose joint is no justification for concentrating attention on that loose joint and disregarding the rest of the mechanism, and still less for making the greatest possible use of the short-lived freedom from economic necessity which the existence of this loose joint permits" (p. 408).

In the context of Hayek's theorizing as it compares to Friedman's, the tight/loose distinction is significant in a different way. It helps identify the "right kind of macroeconomics." The origins of a conspicuous macroeconomic problem, such as a cyclical downturn, possibly followed by a spiraling of the economy into deep depression, are to be found in the loose-jointedness of the allocation mechanism that can allow for a cumulative disequilibrium in the period preceding

the downturn. Unlike the macroeconomic problem itself (a sometimes-dramatic collapse), the *cause* of the problem is not so conspicuous. The inherent looseness, especially if that looseness is being exploited by policymakers for political gain, can allow for a more vigorous economic expansion than can be sustained. But the disequilibrium that characterizes the investment boom, that is, its unsustainability, does not reveal itself until the boom is eventually brought to an end by the systematic mismatch of production plans and consumer preferences.

The role of the economist, Hayek points out (1941, p. 409), is precisely to identify such aspects of the situation that are “hidden from the untrained eye.” For Hayek, the cause-and-effect relationship between the short-run exploitation of the price system’s loose-jointedness and the subsequent economic downturn has a first-order claim on our attention despite the more salient co-movements in macroeconomic magnitudes that characterize the post-downturn spiraling of the economy into deep depression.

On the question of the “right kind of macroeconomics,” Friedman’s judgment stands in stark contrast to Hayek’s. In his general approach to theorizing, Friedman (1986, p. 48) is a soul mate to Keynes: “I believe that Keynes’s theory is the right kind of theory in its simplicity, its concentration of a few key magnitudes, its potential fruitfulness.” As described by Allan Meltzer (1988, p. 18) “Keynes was the type of theorist who developed his theory after he had developed a sense of relative magnitudes and of the size and frequency of changes in these magnitudes. He concentrated on those magnitudes that changed most, often assuming that others remained fixed for the relevant period.”⁴ Friedman’s own professed agreement with Keynes in this regard is confirmed by his adoption of a “simple common model,” to set out the key differences between monetarism and Keynesianism (Friedman, 1970). His simple common model is the algebraic rendition of the once-standard Keynesian analytical framework (IS-LM).⁵ Here and elsewhere Friedman sees his differences with Keynes as empirical and not theoretical.

Friedman’s “right kind of macroeconomics” restricts the theorizing to measurable magnitudes whose variations are of a “substantial size and frequency.” Ruled out of consideration from the outset, then, are any subtle-but-cumulative

⁴ A particularly relevant instance of such an assumed fixity is found in Chapter 4, “The Choice of Units,” of Keynes’ *General Theory*. Here Keynes (1964 [1936], p. 45) suggests that we assume for the sake of simplification that “a given aggregate employment will be distributed in a unique way between different industries.” Keynes’s fixed structure of industry translates readily into the Austrian theory as an assumed fixed structure of production. Such an assumption, of course, would rule out or play from the very outset the very market mechanisms that keep the economy’s growth rate in line with saving preferences and that cause policy-induced growth to be internally conflicted.

⁵ Nearly three decades after introducing the “common model,” Friedman identified this particular tactic (of setting out his own ideas in the language of Keynesianism) as his “biggest academic blunder” (Weinstein, 1999). However, any alternative tactic he might have adopted would not likely have lessened the difference between his kind of macroeconomics and Hayek’s.

deviations in the pattern of investments from the pattern that would be consistent with sustainable growth. With an empirical orientation and a focus on a few key magnitudes, Friedman’s research agenda was limited in its scope by an untenable methodological maxim: big effects must have big causes. (Strict adherence to this maxim would require us to reject the possibility that a forest fire was caused by a discarded cigarette butt.) It is true, of course, that *some* causes and corresponding effects are both big. (Mt. Vesuvius and Pompeii come to mind.) And these, of course, are the ones for which there can be strong empirical support. But some causes—and sometimes the more fundamental causes—can be “hidden from the untrained eye.”

A big change in the quantity of money in circulation has a big effect on the general level of spending. This empirical finding, which is bedrock for Friedman’s monetarism, has as its theoretical expression the equation of exchange: $MV = PQ$, where M is the money supply, V is its velocity of circulation, and PQ is total nominal expenditures (E). Largely because of considerations of data availability, the monetarists’ actual empirical testing made use of total nominal income (Y) rather than nominal expenditures. The economy’s circular flow of earning and spending keeps any difference between these two magnitudes (Y and E) empirically trivial and justifies the substitution of Y for E in the equation of exchange.

Though a profoundly limited methodology, Friedman’s empiricism was enormously successful during the quarter century following his seminal restatement of the quantity theory of money (Friedman, 1956). The validity of the proposition that changes in PQ are associated with proportional or near-proportional changes in M rests on the constancy or near-constancy of V.⁶ And, in fact, the bulk of the empirical work done during the ascendancy of monetarism was aimed at showing that in many different countries and in many different time periods, the demand for money—as gauged summarily by the reciprocal of the money’s income velocity—is a stable demand. The empirical finding in the 1950s and 1960s of a well-behaved demand for money (a near-constant V with only a slight upward trend) was of great significance. It effectively countered the Keynesian vision in which money hoarders can play a major causal role in determining the economy’s level of income and expenditures. Driven by psychological factors, Keynes would have us believe, people’s hoarding propensities, i.e., their liquidity preferences, can change in unpredictable ways. With a sluggishly adjusting price level, the fetishistic behavior of money holders can keep the economy from functioning at its full-employment level.

⁶ Describing the velocity of money as “constant or nearly constant” oversimplifies but without violating the spirit of monetarism. As Friedman (1969, p. 58) in his restatement of the quantity theory, the velocity of money is a stable function of a few variables (wealth, rates of return to bonds and equity shares, and the expected inflation rate). The greater point here is that there are no empirically significant autonomous changes in money’s velocity of circulation.

Friedman's idea of "the right kind of macroeconomics" together with his empirical finding of stable money demand puts into clear perspective his own claim that "We're all Keynesians now." Insisting that he was quoted out of context, Friedman offered an in-context statement that established more accurately his relationship to Keynes: "[I]n one sense, we are all Keynesians now; in another, no one is a Keynesian any longer." He went on to identify the two senses: "We all use the Keynesian language and apparatus; none of us any longer accepts the initial Keynesian conclusions" (Friedman 1968, p. 15). Which is to say, we all set out our macroeconomics in terms of same few highly aggregated magnitudes, but we reject, among other specifics, the conclusion that variations in those magnitudes are caused by a fetish-driven and unstable money demand.

We should note here that Friedman's "all," whatever the intended context, is too inclusive. It should include Keynesians and monetarists but not Austrians. The contrast between Keynes's (and Friedman's) "variations of substantial size and frequency" and Hayek's "aspects hidden from the untrained eye" was specifically at issue when Hayek (1978, p. 25) remarked in his Nobel address—which he aptly titled "The Pretense of Knowledge": "[T]here may ... well exist better 'scientific' evidence [i.e., empirically demonstrated regularities among 'key' magnitudes] for a false theory, which will be accepted because it is more 'scientific,' than for a valid explanation, which is rejected because there is no sufficient quantitative evidence for it." The target of his remark was Keynesianism, which features the empirically demonstrable short-run co-movements of spending and employment, but the remark also has implications for monetarism, which features, almost exclusively, the empirically demonstrable co-movements of the money supply and nominal income, the movements in the latter ultimately taking the form of movements in the overall price level.

The contrast between the two methodologies is also directly at issue when Friedman claims, in reference to inter-war expansion and subsequent contraction, that "Everything going on in the 1920s was fine," and that "what happened in the thirties explains the thirties, not what happened in the twenties" (Skousen, 2005, p. 166 and p. 181 *fn* 9). Friedman's "everything going on in the 1920s" must be understood to mean everything *that can be described with the Keynesian language and apparatus*.

Relatedly, the differing methods—of discerning the hidden forces for Hayek and tracking the dramatic co-movements for Friedman—accounts for the differing judgments as to just what the important questions are about the interwar experience. What was the initiating cause that turned good times into bad? And why were the bad times of the 1930s so awfully bad. Hayek pointed to the policy-induced misallocations during the 1920s as the cause and was content to leave it to the historians to catalog all the subsequent policy perversities that made the bad situation worse. Friedman, who was blind to the market mechanisms working at sub-aggregate levels during the 1920s, deflected the whole issue of the initiating

cause by characterizing the initial downturn as an "ordinary" recession.⁷ The real question for Friedman—that is, the question that could be answered using quantitative methods—was about the magnitude of the contraction that followed the downturn.

Although Friedman's monetarism was methodologically incapable of exposing those hidden aspects of the boom that were key to Hayek's theory, its empirical demonstrations of the stability of money demand did have its intended effect of focusing attention on the money supply. That is, if the variations of the Keynesian macroeconomic magnitudes were not attributable to fetish-driven money demanders, then they must be attributed to the bungle-prone money supplier. It is changes in M and not changes in V that are associated with changes in PQ . In the long run, money-induced changes in PQ resolve themselves into changes in P , the economy's real output (Q) ultimately being determined solely by real inputs (and hence not at all by the quantity of money in circulation). It follows almost as a corollary that *until* the price level fully adjusts itself to a changed quantity of money, quantity adjustments, possibly substantial ones, will characterize the adjustment process.

The combination of the classical proposition about the long-run neutrality of money together with the empirically demonstrated stability of money demand underlies Friedman's claim that the Great Depression, or, more specifically, the severe economic contraction that began after the 1929 stock-market crash and lasted well into 1933, was almost wholly attributable to the collapse of the money supply. Similarly, his classically inspired empirical studies underlie his claim that "inflation is always and everywhere a monetary phenomenon" (Friedman, 1968, p. 39). In the long run, increases in M in excess of increases in real output are followed by proportionate increases in P .

With due allowances for allocation effects and wealth effects, which can last well beyond Friedman's short run, this long-run proposition about the relationship between the money supply and the general level of prices was disputed neither by Hayek nor by any of the other Austrian economists. In fact, Ludwig von Mises incorporated the quantity theory of money into his own thinking in *The Theory of Money and Credit* ([1912] 1953, p. 146-151). He defended this theory, which he simply took to be the supply-and-demand approach to explaining money's value, against the then prevalent theory that money is imbued with value by the state. But, for Hayek (as well as for Mises), establishing P 's long-run near-proportionality to M is only a minor part of the task of monetary theory. More demanding—and more relevant to the issues of the business cycle, monetary policy, and monetary

⁷ Modern macroeconomists who see merit in Hayek's account of the initial downturn have understandably become sensitive to the varied expressions—ordinary recession, routine recession, garden-variety recession, run-of-the-mill recession—all of which are dismissive of the question that Hayek's theory aims to answer.

reform—is the task of identifying the shorter-run non-neutral aspects of money. What can be said about the movements of real output during a monetary expansion and about money-induced changes in relative prices and hence in the pattern of output? More specifically, how is the relationship between the valuation of outputs and the corresponding valuation on inputs affected by changes in the money supply? The answers to these and related questions—by virtue of the nature of the questions themselves—must be firmly anchored in what Hayek calls “pure theory,” by which he simply means the microeconomic relationships, which may be temporarily-but-systematically distorted by changes in the money supply.

Macroeconomic Aggregates and Macroeconomic Patterns

It has long been perceived that Keynes is the father of macroeconomics. There is an important sense in which this perception is correct. Keynes’s *General Theory* certainly represents a break with ongoing developments in economics and even a break with his own earlier work. Reflecting years later on Keynes’s influence and expressing regret for not having reviewed Keynes’s book, Hayek identified the “decisive reason” for failing to write a review (one reason among several; again, see Caldwell, 1998): Hayek had an aversion to macroeconomics *per se*. His exact remarks require close scrutiny. Although ripe for misinterpretation, they can be revealing about the key difference between Hayek and Keynes—and *a fortiori*—between Hayek and Friedman.

There was [one] reason which I then only dimly felt but which in retrospect appears to me the decisive one: My disagreement with that book did not refer so much to any detail of the analysis as to the general approach followed in the whole work. The real issue was the validity of what we now call macro-analysis, and I feel now that in a long-run perspective the chief significance of the *General Theory* will appear that more than any other single work it decisively furthered the ascendancy of macroeconomics and the temporary decline of microeconomic theory (Hayek, 1978, p. 284).

Was it Hayek’s intent to declare *all* of macroeconomics invalid? That could hardly be so. Students at the London School of Economics in the 1930s were immersed in Hayekian thought and at the same time were well aware of the Keynesian alternative. The oft-quoted reckoning by John Hicks (1969, p. 203) features Keynes and Hayek as the major contenders for the field. And the field, of course, was macroeconomics, though the term itself was not yet in common use. Both Keynes and Hayek theorized about business cycles and particularly about the unemployment associated with downturns and depressions. They both wrote about the relationship between saving and investment and about money, interest rates, and wage rates. In short, they were both macroeconomists.

At most, what Hayek “only dimly felt” was the categorical difference between his kind of macroeconomics and Keynes’s kind of macroeconomics. Some two decades after the publication of the *General Theory*, the difference that emerged between Friedman and Keynes was relatively minor compared to the difference between Hayek’s macroeconomics and Keynes and Friedman’s macroeconomics. Still, Hayek’s claim of a dim feeling even in this sense is puzzling. The major theme in his *Monetary Theory and the Trade Cycle*, ([1928] 1975) which was published years before Keynes’s *General Theory*, is that the quantity theory of money has relevance beyond the simple across-the-board relationship between the quantity of money and the overall level of prices. Perceiving an undue emphasis on the price level that characterized then-prevalent monetary theory, Hayek showed that the quantity theory can serve as the starting point for an analysis of *relative* price changes that are induced by the extension of bank credit. How, then, could his general dissatisfaction with the sort of macroeconomics as set out in the *General Theory* be “only dimly felt”?

Hayek’s criticism of the crude “Quantity Theory school,” as he called it, was extended years later to apply to Keynesian crudities. In a 1979 interview, Hayek explicitly categorized “Keynes’s economics as just another branch of the centuries-old Quantity Theory school, the school now associated with Milton Friedman” (Minard, 1979, p. 49). Keynes, according to Hayek, “is a quantity theorist, but modified in an even more aggregative or collectivist or macroeconomic tendency” (*Ibid.*). Modern mainstream macroeconomists may be puzzled that Hayek—or anyone—would associate Keynes of the *General Theory* with Friedman of the “Optimum Quantity of Money.” But Keynes and Friedman are similar in Hayek’s perception in terms of their macroeconomic methodologies—a perception that is confirmed by Friedman himself when he praised Keynes for having the “right kind of economics.”

The contrast between monetarism and Keynesianism stems from Friedman’s considerably narrowed conception of the quantity theory. He began his 1956 restatement with the claim that, “The quantity theory is in the first instance a theory of the *demand* for money” (Friedman, 1969, p. 52, *emphasis original*). In Friedman’s hands, it is a theory that, contra-Keynes, the demand for money is stable. And with V not changing much, PQ moves with M . The centuries-old Quantity Theory that united Keynes and Friedman in Hayek’s mind was characterized by its high level of aggregation which allows the role of money to be analyzed exclusively in terms of the price level and without regard to the pattern of prices or the corresponding mix of outputs. With this definition, Keynes’s conception of macroeconomic equilibrium as an equality between total income and total expenditures ($Y = E$), where the Y and E change in real terms when economic activity is below its full-employment potential and change in nominal terms when the economy is pushed beyond its full-employment potential, falls comfortably into the quantity-theory tradition.

For Hayek, what mattered was the *patterns* of spending on consumable output

and on the factors of production. To focus on total expenditures and total income is to overlook the foundational microeconomic relationships that give meaning to the notion of a macroeconomic equilibrium. This is the point of Hayek's early charge that "Mr. Keynes's aggregates conceal the most fundamental mechanisms of change" (Hayek, 1931, p. 227). On this count, Friedman's quantity-theory reckoning was less attractive—i.e., more aggregative—than Keynes's circular flow. Keynes, after all, did *disaggregate* the total expenditures of the private sector into consumption expenditures and investment expenditures: $E = C + I$. Friedman combined the two categories of output into a single aggregate output: $Q_C + Q_I = Q$. The output magnitude in Friedman's quantity theory does not differentiate in any substantial way between consumption and investment.

In Hayek's macroeconomics, the wrong mix of consumption and investment and the wrong temporal pattern of investment activities can constitute a macroeconomic disequilibrium—even though total spending in the current period might equal current income and even if the overall price level is constant. In Hayek's view, something important is missing from any macroeconomics theory that does not give emphasis to this aspect of macroeconomic disequilibrium.

The Missing Trade-off—between Consumption and Investment.

As in other respects, the contrast between Hayek's and Friedman's macroeconomics is best put into perspective by first reviewing Hayek's dissatisfaction with Keynesian theory. As already indicated, Hayek considered Keynes's theorizing to be in the quantity-theory tradition—this despite Keynes's dividing total private spending into two constituent components. Keynes's distinction between consumption spending and investment spending was not made in order to allow for a trade-off between these two magnitudes but rather in recognition that one of the components, namely investment spending, was subject to unpredictable changes in both magnitude and direction.

Keynes's "animal spirits," which drive investors and which wax and wane with the winds of business psychology, cause investment spending to change accordingly and cause total spending to change in the same direction with an amplified magnitude. When investors are moved by the animal spirits, the high investment spending and higher total spending generates correspondingly higher incomes, out of which people engage in more consumption spending and more saving. Similarly, if consumption spending were to decrease, say, as a result of an increase in saving propensities, then spending generally would decrease, too. The slack economy would likely dampen the animal spirits that motivate the investment community. Here, the principle of derived demand is in play. In Keynes's construction, then, the two spending magnitudes move together (though at different rates). Neither ever moves at the expense of the other. There is no allowance for a trade-off between consumption and investment.

Reflecting on the Keynesian Revolution three decades after the publication of

the *General Theory*, Hayek ([1966] 1978, p. 285) focused on the "relation between the demand for consumers' goods and the volume of investment" in order to establish this critical difference between Keynes's theorizing and his own. "There are undoubtedly certain conditions in which an increase of the demand for consumers' goods *will* lead to an increase in investment. But Keynes assumes that this will always be the case." The "certain conditions," of course, are conditions of economywide unemployment of labor and other factors of production. But at least sometimes, scarcity is a binding constraint. Under these conditions, consumption (in the current period) and investment (that will allow for increased consumption in some future period) must present themselves as trade-offs.

Abba Lerner and others who were learning from both Keynes and Hayek in the 1930s were alive to this defining distinction (Colander and Landreth, 1996). For Keynes, consumption and investment move up and down together, their path of possible movements only occasionally (and quite by accident) bumping up against the constraint imposed by scarcity; for Hayek, these two magnitudes must be traded off against one another at full employment. And understanding the market process that can facilitate the desired trade-off, Hayek insisted, is a strict prerequisite to understanding how that process might malfunction (or be derailed) in such a way as to result in the widespread unemployment of labor and other factors of production.

While Keynes's theoretical construction effectively denied even the possibility of a trade-off, his highly aggregative treatment of investment concealed the market mechanisms that make such a trade-off possible. Hayek's alternative construction entailed a multi-stage structure of production whose separate stages are affected differentially by a change in consumption spending. For instance, an increase in saving, which *means* a reduction of consumption spending, impinges in a two-fold way on the stages of production. Late-stage production activities are curtailed by the derived-demand effect. But early-stage production activities are bolstered by the decreased interest rates, which are the direct consequence of increased saving. Resources are allocated away from the production of current and near-future consumables and toward the production of more-remote future consumables. This reallocation, which is consistent with the change in the hypothesized spending-and-saving propensities, is achieved by the interplay of the derived-demand effect and the interest-rate effect. It was Keynes's failure to recognize this interplay and its significance that led Keynes to articulate his infamous paradox of thrift.

The ruling out of any consumption-investment tradeoff and the neglect of the market mechanisms that might facilitate it was rightly seen as the Achilles heels of the Keynesian construction. Unfortunately, these critical issues were put into total eclipse by the Monetarist counterrevolution. The equation of exchange makes no first-order distinction between consumption and investment. These two components of the economy's output make only a summary appearance—as the Q in the equation of exchange, $MV=PQ$ —where Q includes the economy's consumable output as well as net additions to its capital stock. And further removing the critical

tradeoff from view, the monetarists do not write the equation of exchange explicitly in terms of output (Q) but rather in terms of the conceptually equivalent real income (y) paid to labor and other inputs in the process of producing it. (Using lower case to indicate a real magnitude, i.e., $y = Y/P$ is standard in monetarist literature.) The issues that are central to Hayek's macroeconomics and key to exposing the oversights and fallacies in Keynes's, are buried deep in Friedman's $MV=Py$.

The Monetarists' Tradeoff and the "Missing Equation"

While the Austrians' macroeconomic construction features the relative movements of consumption and investment, the monetarists' construction features the distinction between nominal and real changes in the economy's total output (of both consumption goods and investment goods). That is, in the short run, a change in nominal output (as measured by nominal income, Py) entails some combination of a change in the general level of prices (P) and a change in real output, or real income (y). Of particular interest to the monetarists, of course, are the consequences for P and y of an increase (or decrease) in the money supply. The general issue here resolves itself into the question of the P - Q split or, equivalently, the P - y split.

The hard core of monetarism is its demonstration of the nature of the P - y split in the context of the long run. The proposition for which Milton Friedman is best known is that, in the long run, money-induced changes in Py consist wholly of proportionate changes in P and hence not at all in changes in y . The long run is understood to be a period sufficiently long (typically 18-30 months) for market mechanisms, whatever their particulars, to adjust the level of prices to the higher money supply.

In the simple case of a constant velocity of money and no real economic growth, the long-run relationship between the money supply and the price level is one of strict proportionality. For an economy that experiences a real economic growth rate in the low single digits, a money supply that is made to grow at that same rate results in an unchanging price level. This is the basis for Friedman's monetary rule: year in and year out, the growth rate of the money supply should be made to match real economic growth.

The short run is a different story—and a variously told story. The issue of the P - y split during the economy's adjustment to a change in the money supply constitutes the soft underbelly of monetarism—a "major unsettled issue" Friedman (1992, p.49). Recognizing that the monetarist framework was not a closed system of equations except in its long-run application, Friedman discussed the short-run P - y split in terms of a "missing equation." In a 1974 exposition (in Gordon, ed., 1974, p. 31ff) he combines the main Keynesian variables (consumption, investment, income and the interest rate) with the essential monetarist variables (the money supply, money demand, and the price level) into what he calls a "simple

common model." Tellingly, the common model has six equations and seven unknowns—hence a missing equation. Friedman points out that the two simplest ways to close the system of equations are (1) to take the price level as given, which gives the system of equations a short-run Keynesian orientation or (2) to take real income as given, which gives them a long-run monetarist orientation. Friedman then provides a lengthy account of a "third approach" (Gordon, pp. 34-40) in which the system of equations is closed by dealing only with nominal income, Py , and not addressing the issues of the P - y split. Offering as monetarism's hardest core proposition the near proportionality between the money supply and nominal income, while remaining agnostic about the nature of the P - y split, has since become monetarism in its most defensive mode. The near-proportionality is a direct implication of the empirically demonstrated near-constancy of the velocity of money. This mode of thinking is consistent with the statement of Friedman and Schwartz ([1963] 1969, p. 222) in which they adopt an agnostic attitude about the "transmission mechanism" through which changes in the money supply affects the economy's real variables:

We have little confidence in our knowledge of the transmission mechanism, except in such broad and vague terms as to constitute little more than an impressionistic representation rather than an engineering blueprint. Indeed, this is the challenge our evidence poses: to pin down the transmission mechanism in specific enough detail that we can hope to make reasonably accurate predictions of the course of a wide variety of economic variables [i.e., the seven unknowns —RG] on the basis of information about monetary disturbance.

At this point, we have three approaches to dealing with the missing equation: a short-run Keynesian \bar{P} , a long-run monetarist \bar{y} , and a short-run agnostic monetarist Py .⁸ In his preliminary remarks, Friedman rightly and revealingly recognizes that these three approaches are no where near exhaustive. He points out that to close the seven-variably, six-equation system, "[s]ome one of these variables must be determined by relationships outside the system" (p. 31). And in a footnote, he immediately expands the possibilities: "It is not necessary that a single variable be so determined. What is required is an independent relation connecting some subset of the seven endogenous variables with exogenous variables, and that subset

⁸ Left out of account here is the common textbook exposition of long-run/short run Phillips analysis. True, the market process that moves the economy along a short-run Phillips curve and then causes the curve itself to shift was set out by Friedman himself. But his analysis was intended, as I argue elsewhere (Garrison, 2001, p. 199-203), primarily as an immanent criticism of the 1960s-style Keynesian policy menu and not as the monetarist account of the P - y split. The very notion that it is rising prices, as differentially perceived by employers and employees, that lead to an increase in output is directly at odds with one of the fundamental propositions of monetarism: According to Friedman (1970c, p. 23), "the change in the growth rate of nominal income [following an increase in the money supply] typically shows up *first* in output and hardly at all in prices," Q rises first. Also, the supposed labor-market dynamics that are central to the Phillips curve story imply that the real wage rate falls during a money-driven boom—an implication that, to my knowledge, has no empirical support.

could in principle consist of all seven variables” (p. 31 fn 18).

Here, Friedman may be seen as recognizing the open-endedness of ways to close the system. But his open-ended possibilities are constrained by Keynes and Friedman’s “right kind of macroeconomics.” There is a pre-emptive ruling out of transmission mechanisms that may be operating *within* one or more of the seven variables. As dictated by his methodology, attention is limited to measurable magnitudes whose variations are of a substantial size and frequency.

Ironically, Friedman’s earliest attempt to deal head-on with the lag that separates a change in the money supply and the eventual change in the price level focused on market mechanisms that work *within* one of the seven variables. Why should this time lag between the injection of new money into the economy and the full adjustment of the price level be so long? To answer this question, Friedman ([1961] 1969b, p. 255) focuses largely on market mechanisms *within* the investment aggregate—mechanisms that are triggered by the initial holders of the injected money:

Holdings of cash will...bid up the price of assets. If the extra demand is initially directed at a particular class of assets, say, government securities, or commercial paper, or the like, the result will be to pull the prices of such assets out of line with other assets and thus widen the area into which the extra cash spills. The increased demand will spread sooner or later affecting equities, houses, durable producer goods, durable consumer goods, and so on, though not necessarily in that order.... These effects can be described as operating on “interest rates,” if a more cosmopolitan [i.e., Hayekian—RG] interpretation of “interest rates” is adopted than the usual one which refers to a small range of marketable securities.

If his consumer durables qualify as investment, then Friedman is dealing with different sub-aggregates that make up the investment magnitude. The distinction between durables and non-durables is a rough proxy for Hayek’s distinction between various stages of production: “durable translates into “earlier stage.” What Friedman has in mind, of course, is the distinction between sources and services or, equivalently, stocks and flows. This is the distinction that underlies Frank Knight’s capital theory. Nonetheless, Friedman’s characterization of the market process that occurs between the increase in the money supply and the eventual rise in the price level has a distinct Austrian flavor—including the temporarily low rate of interest and the inherently self-reversing character of the adjustment process. In the continuation of his account (pp. 255-56) Friedman’s “reactions” that “undo the initial effects” are Hayek’s self-reversing process:

The key feature of this process [during which interest rates are low] is that it tends to raise the prices of sources of both producer and consumer services relative to the prices of the services themselves.... It therefore encourages the production of such sources and, at the same time, the direct acquisition of the services rather than of the source. But these reactions in their turn tend to raise the prices of services relative to the prices of sources, that is, to undo the initial effects on interest rates. The final result may be a rise in expenditures in all directions without any change in interest rates at all; interest rates and asset prices may simply be the conduit through which the effect of the monetary change is transmitted to expenditures without being altered at all....

The idea that artificially low interest rates govern resource allocation during the boom and that this market process is inherently self-reversing are, of course, central to the Austrian account of boom and bust. All that is lacking in Friedman’s stock-flow accounting of the process is a recognition of a more thoroughgoing intertemporal capital structure. But even this aspect of the process is brought into view when Friedman (p. 256) abandons his strict Knightian stock-flow construction:

It may be ... that monetary expansion induces someone within two or three months to contemplate building a factory; within four or five, to draw up plans; within six or seven, to get construction started. The actual construction may take another six months and much of the effect on the income stream may come still later, insofar as initial goods used in construction are withdrawn from inventories and only subsequently lead to increased expenditure by suppliers.

Friedman’s objective in this 1961 article is to make plausible the empirical finding of an otherwise implausibly long lag between the increase of the money supply and the eventual near-proportional increase in the price level. But while he makes the long lag plausible, he inadvertently created doubts that the overall price (rather than relative-price changes and hence resource misallocations) should be central to his theory and that the full adjustment to the monetary injection is complete once the price level has risen. From his earliest writings, Hayek insisted that the economy’s loose-jointedness and, more specifically, the scope for misallocation of resources into long-term-but-unsustainable capital should be the central focus. And we see now that Friedman’s long lag is attributable to Hayek’s loose joint.

The 1961 article is particularly revealing in the context of the subsequent search for the missing equation. Friedman’s monetary framework, set out on the basis of Keynesian variables, is in fact one equation short. But adding a seventh equation in terms of those seven variables fails to close the system in a satisfying way. And on the basis of Friedman’s 1961 discussion of the lag, we see that what is actually missing is Hayek.

No candidate seventh equation, whether $P = \bar{P}$, $y = \bar{y}$, $Y = Py$ (or any other equation restricted to the seven Keynesian variables), will do the job. Rather, the short run variations are to be accounted for in terms of money-induced movements of resources that are eclipsed by the Keynesian—and monetarist—aggregates. Hayek’s early criticism of Keynes applies equally to Friedman: “[Mr. Friedman’s] aggregates conceal the most fundamental mechanisms of change.”

Why, we must ask, couldn’t—or didn’t—Friedman put his earlier treatment of the lag in play when setting out his own analytical framework? The answer to this question is readily at hand: Because so doing would be contrary to his fundamental methodological precepts. Teasing the cause of the downturn out of the pattern of resource allocation during the boom is not the right kind of macroeconomics—especially as applied to the interwar experience of boom and bust. During the 1920s, there were no macroeconomic magnitudes undergoing such

dramatic change as to capture Friedman's attention. And undramatic changes, such as those that may well have been going on within the output aggregate, were *ipso facto* seen as incapable of having dramatic consequences. Besides, any attempt to track capital movements at a low level of aggregation would be fraught with measurement problems and, in any case, would be irrelevant in view of the Knightian stock-flow conception of capital and income. Finally, actual movements in interest rates during the 1920s appeared minor at best and hence hardly warranted any concern about money-induced effects on resource allocation.

Hayek and the Hidden Forces During the 1920s Boom

The task of the economist, according to Hayek, is precisely to look for aspects of market forces that are apt to be hidden from the untrained eye. There is probably no better example of such hidden forces than those that occurred during the boom of the 1920s (and, more recently, during the boom of the 1990s). The combination of technological advance and accommodating monetary policy leaves interest rates largely unaffected but skews the pattern of investment, putting it in conflict with intertemporal preferences and hence with the pattern of consumer spending.

As conventionally told, the story of the business cycle entails an actual lowering of the interest rate by the central bank. The artificially cheap credit results in excessive investment in long-term (and hence interest-rate sensitive) projects. At the same time, the low return on saving results in an increase in current and near-term consumption. In short, an artificially low interest rate drives a wedge between saving and investment and sets the economy off on an unsustainable growth path.

A conceptually separate story, the story of technological advance, entails a temporarily *high* market rate of interest. Improvements in technology, such as occurred during the 1920s (electrification, home appliances, processed foods, industrial chemicals, cosmetics, and the mass production of automobiles) gave increased leverage to investment spending. This meant that a given level of investment spending could in time yield more and/or better consumer goods than before. Consumers, however, would be eager to take at least some of those gains in the form of current consumption. New employment opportunities resulting from the technological advance are accompanied by increased spending on *currently available* consumables. Hence, the saving out of the rising incomes does not allow for a full-throttle implementation of the new technology. Inventories of consumer goods are drawn down, and hence some resources are drawn in this direction to accommodate the increased consumer demands. Competition for investment funds—to serve current consumer demand *and* to implement the new technology—causes the interest rate to rise.

In his earliest writings on monetary theory, Hayek ([1928] 1975) identified the temporary increase in interest rates during the implementation period as the interest-rate brake. That is, while increased earnings and increased saving allow for

the implementation of new technologies, the actual spending patterns of consumers sets a limit on the rate of implementation so as to allow for some increased consumption to be enjoyed during the implementation period.

When the basic story of the business cycle is superimposed onto the story of technological advance, it is not surprising that the interest rate seems not to play a major role. It undergoes little or no change because the downward pressure of credit expansion offsets the upward pressure of the interest-rate brake. Further, the fact that there is no clearly discernable net movement in the interest rate during the 1920s is not a matter of coincidence. The Federal Reserve's policy of accommodating the needs of trade, a policy based on the real bills doctrine, meant that any increased demand for investment funds would be met by an increased supply of credit rather than by an increased interest rate. That is, as a matter of policy, the Federal Reserve overrode the interest-rate brake, allowing the pattern of investment to get cumulatively out of line with the pattern of spending.

Hayek's own summary assessment ([1928] 1975, p. 179) is to the point, although in his early work on business cycles, he attributed the cycles to any system of elastically supplied credit rather than to ill-fated policies of a central bank:

The immediate consequence of an adjustment of the volume of money to the "requirements" of industry is the failure of the "interest brake" to operate as promptly as it would in an economy operating without credit. This means, however, that new adjustments are undertaken on a larger scale than can be completed; a boom is thus made possible, with the inevitably recurring "crisis."

The "crisis" in this passage refers to the inevitable downturn that eventually comes about as a result of the cumulative mismatch of the pattern of investment and the pattern of spending. This was his theory—more broadly, the Austrian theory—of boom and bust. And his judgment that the 1920s boom was not sustainable was made well before the bust. In 1923, while studying at New York University and watching the Federal Reserve, Hayek began work on a Ph.D thesis to answer the question, "Is the function of money consistent with an artificial stabilization of purchasing power?" (Hayek, 1984, p. 7). In retrospect, we might rephrase the question, "Is Friedman's monetary rule consistent with sustainable growth? No doubt, had Hayek completed that thesis, the interest-rate brake and the perversities of the real-bills doctrine would have been central to his argument.

In Hayek's view, the particulars of the market process that characterize the boom have a first-order claim on the economist's attention, despite any subsequent spiraling downwards of income and spending and despite subsequent ill-conceived fiscal and monetary policies that, along with trade policies, price supports, and relief programs, made the ensuing depression much deeper and much longer than it otherwise would have been. The fact that movements in the macroeconomic aggregates can be large ones and the correlations among the aggregates can be strong ones does not detract from the significance of the policy-driven market

process that preceded the bust.

A Summary Judgment: Methodology as Trumps

A careful reading of Hayek's and Friedman's monetary theory reveals some common ground. Neither Hayek nor Austrian economists generally have denied the kernel of truth in the quantity theory of money. No doubt, the long-run relationship between the money supply and the price level (as well as its implications for monetary reform) accounts for the occasions in which Hayek minimized the differences between Friedman and himself. The merits of a Hayek-Friedman alliance were especially obvious in the 1970s, when monetary restraint in almost any form had to be considered preferable to a continuation of the money-driven double-digit price-and-wage-inflation. This aspect of the common ground is, no doubt, fairly widely understood.

Hardly recognized at all, however, is that Friedman, who has issued emphatic and wholesale dismissals of Hayek's *Prices and Production*, actually wrote his own *Prices and Production* in the form of "The Lag in Effect of Monetary Policy." The key excerpts from that article (presented above) have an undeniable Hayekian flavor. A Friedman-Hayek alliance would seem to be in order especially in the context of the 1920s, when the story to be told could not be convincingly told in terms of the Keynesian aggregates. Friedman's own story of the M-P lag and hence the P-y split fills in the blanks and aligns his own understanding of the boom with Hayek's

It can only be that Friedman's pre-commitment to Keynes's kind of macroeconomics stood in the way of such an alliance. For Friedman, methodology trumped. But with the methodological issues fully in view, modern readers can appreciate both Friedman's post-boom empirical findings and Hayek's pre-bust economic insights.

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