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The "Classical" Monetary Theories of Marshall, Wicksell, and Keynes and The General Theory's Critique: Equilibrium, Price Trends, and Cycles

by

William Beryl Gaynor Jr.

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Department of Economics, McGill University, Montréal, Quebéc, Canada

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Abstract

We first demonstrate the importance of the doctrines of the quantity theory and the long-period stationary state in the formulation of Marshall's, Wicksell's, and Keynes' pre-General Theory monetary theories. We analyze the anomalous events characterized by these writers as short-period phenomena. From the perspective built up around the quantity equation and its long-period context, business cycles represent economic convolutions in which the behavioral mechanisms of the long-period break down. We demonstrate the theoretical breakdown; importantly, it is not reflected in the work of these writers that they understood that their explanations of short-period events undermined the long-period theorizing they carefully built. Second, it is argued that Keynes saw the General Theory as a theory of the short-period in contrast to the long-period monetary frameworks. We use the General Theory's criticisms of classical monetary theory to establish this point.

Résumé

Nous démontrons l'importance des doctrines de la théorie de quantité et de l'état stationnaire de longue période dans les théories monétaires de Marshall, Wicksell, et Keynes avant la Théorie Générale. Nous analysons des événements anomaux que ces auteurs caractérisent comme des phénomènes de courte période. De la perspective de l'équation de quantité et de son contexte de longue période, les événements de courte période, comme les cycles d'affaires, représentent les circonvolutions d'une économie où s'écroulent les mécanismes de comportement de longue période. Nous démontrons cet écroulement théorique; principalement que ces auteurs ne montrent pas qu'ils aient compris que leurs explications des événements de courte période ont sapé celles qu'ils développent à propos des événements de longue période. Nous utilisons les critiques de Keynes sur la théorie monétaire classique pour établir qu'il considérait la Théorie Générale comme une théorie de courte période par contraste avec les modèles monétaires de longue période.

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Introduction

Main Themes and Contributions

This is a thesis on the history of economic doctrine. It presents two sets of arguments. The first set analyzes the theoretical structure of "classical" monetary theory. The second set presents the General Theory's critique of "classical" monetary theory and situates the General Theory's theoretical structure in contrast to that of "classical" monetary theory's.

In the first set of arguments I demonstrate through extensive textual references the importance of the doctrines of the quantity theory and of the long-period stationary state in the formulation of the pre-General Theory monetary theories of Marshall (1923), Wicksell (1898), and Keynes (1930a&b). I then argue that the quantity theory of money led these authors to adopt a long-period, stationary-state perspective at the core of their theoretical structure. This contention is most clearly expressed in Wicksell's Interest and Prices, but is also, I argue, central to an understanding of Marshall's Money, Credit, and Commerce and Keynes' A Treatise on Money.

I analyze, again through extensive textual reference, the anomalous events characterized by these writers as short-period phenomena: crises, trade cycles or business cycles. These writings tend to locate the possibility of equilibrium in a long-period context, while the short-period is associated with disequilibrium states. Further, these writers develop their long-period theories to explain price-level trends, and define their equilibrium states relative to price-level stability. The short-period is associated with two rather

distinct phenomena. First, it characterizes the economy's disequilibrium movement as an inflationary or deflationary price trend from one position of price stability to another. Second, the short-period characterizes the business or trade cycle. But importantly, both types of short-period events are explained by using variations on theories developed from the long-period equilibrium perspective of the stationary state.

From the perspective built around the quantity equation and its long-period stationary-state context, short-period events -- trade cycles or crises -- represent convolutions of an economy in which the behavioral mechanisms of the long-period break down. I demonstrate the theoretical breakdown, which is interesting in itself, but go on to show that these writers did not understand that their explanations of short-period crises undermined the long-period theorizing they so carefully built. The short-period crisis represents, so to speak, the worm in the long-period apple.

The second set of arguments presented in the thesis are concerned with establishing the short-period setting of the General Theory. I argue that Keynes saw the General Theory as a theory of the short-period in contrast to the long-period monetary frameworks of his own Treatise[1] and that of Marshall (1923) and Wicksell (1898). Keynes has remarked that the position he presented in 1936 is to be contrasted with "orthodox theory" which is "particularly applicable to the

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[1] Throughout the thesis Keynes' A Treatise on Money will be referred to as either the Treatise, Keynes (1930a&b), Keynes (1930a) or Keynes (1930b), where 'a' and 'b' refer to volumes one and two respectively. The Collected Writings of John Maynard Keynes will be cited as CWJMK with the relevant volume number and page numbers attached.

stationary state" [Keynes (1937a) p.107] and "concerned with what we now call long-period analysis" [Keynes (1937b) p.112].[2] I present an argument for a short-period interpretation of Keynes (1936) by outlining the details of the General Theory's critique of "classical" monetary theory.

I find in the earlier works not only a reliance on the quantity theory and the stationary state as motivating and organizing principles, but also an extensive reliance on wage, price, and interest-rate flexibility. The latter three are relied upon to express the equilibrating and stabilizing forces that maintain a stationary full-employment economy. Keynes in the General Theory argues at length against the effectiveness, if not the illogic, of price flexibility in maintaining an "optimum or ideal" full-employment economy [CWJMK Vol.29 p.54]. As well, I find him reformulating his theory of effective demand in a manner that allows him to argue that the quantity theory is but a special case of his new theory. "Classical" monetary theory was, at least in part, what Keynes was escaping in his "long struggle of escape" [Keynes (1936) p.xxiii].[3]

Situating the General Theory in the short-period and demonstrating it to be critical of thinking that dwells on full-employment "optimum" long-period outcomes will come as no surprise to Keynesians. They

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[2] Robinson (1973 p.xv) has stated Keynes "brought the argument down from timeless stationary states into the present."

[3] There is a true "irony," as Howitt (1989 p.1) has stressed, also see Howitt (1986 pp.628-629), in the traditional textbook view of Keynes (1936) relying on rigid nominal wage to bring about an underemployment equilibrium when Book V of the General Theory spends more than fifty pages addressing the ineffectiveness of flexible prices.

accept the fixity of plant and equipment as a hallmark of short-period analysis; and they accept the fixity of the nominal wage and the limitations it places on equilibrium adjustments. But there is more to the General Theory's short-period analysis than the fixity of plant and equipment, and it explicitly argues against the equilibrating potential of price flexibility. Its short-period analysis derives also from a monetary tradition captured in Marshall (1923), Wicksell (1898), and Keynes (1930a&b). This tradition attached a different meaning to the notions of long-period and short-period, though not necessarily mutually exclusive meanings as we would find them, for example, in Marshall's Principles.

The stationary state of the monetary tradition implies that expected values and actual or realized values of motivating economic variables coincide, including the proceeds that motivate investment. The General Theory's arguments against price flexibility as an equilibrating force undermine the necessity of a stationary state, or steady state, and its required level of investment. I argue that the state of long-term expectations, which determines investment decisions in the General Theory, replaces the stationary-state level of investment. While the long-period of the stationary state defined the equilibrium in the earlier monetary tradition, Keynes (1936) now defines his equilibrium relative to a given state of long-term expectations. A given state of long-term expectations no longer necessarily implies a level of investment sufficient to maintain stationary or steady-state long-period conditions. The equilibrium of the General Theory is a short-period one relative to the long-period

equilibrium of the stationary state.

Contribution to the Debate

Leijonhufvud (1981 p.168) has called the method of Wicksell (1898) and Keynes (1930a&b) a "two-stage approach." In the first stage, price level trends were analyzed and in the second stage they addressed in an "ad hoc" manner cyclical movements in price, employment, and output. These stages correspond to what we have characterized as long-period and short-period analysis respectively. It is not fully appreciated in the secondary literature how much influence the stationary-state theorizing of the first stage had on the cyclical, second-stage, explanations. The latter were contorted or contrived to fit the principles established in the long-period equilibrium analysis of the quantity theory. The short-period explanations were not truly "ad hoc." The quantity theory and the hypothesized behavior built around it ruled the roost. Most telling of the quantity theory's influence was the manner in which short-period events characterized by unemployment were analyzed to evolve through price-level changes. We will explore these contortions and price-level changes in detail.[4]

The stationary-state condition, or its steady-state growth generalization, which underlies the fundamental equations of Keynes (1930a&b), implies that the economy is modeled under a full-employment

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[4] Writing about the "established economic theory" of the time period immediately preceding the General Theory Clower (1975) states that its "equilibrium and stability presuppositions" led to a

> [p]rofessional awareness of the growing discrepancy between presumption and reality...most clearly apparent in the business cycle literature of the era... Clower (1975) p.188 my brackets.

This "discrepancy" is also revealed in the theoretical writings chosen for discussion in this thesis when those writers address the business cycle, although there is little "awareness" of the "discrepancy."

assumption. Keynes (1930a&b) does analyze fluctuations in employment and output, but they are secondary to his theoretical structure; and we will argue that they cannot be handled by his long-period theory designed to explain price trends. Patinkin (1976) argues that "[t]he basic problem" Keynes was trying to explain in the Treatise was the trade cycle "and the fluctuations in employment and output which characterize it." Patinkin's statement presents a misleading picture of Keynes' analysis [Patinkin (1976) p.33 p.37 p.45]. Bridel (1987 p.127 p.137) places a similar emphasis on changes in employment and output in the Treatise. This is slightly surprising since Bridel is careful to link the Treatise's analysis to Marshall's long-period full-employment perspective [Bridel (1987) p.47 p.127].

Eshag (1963 p.88) notes that Marshall in his monetary theory when faced with "various short-period problems" tended to apply the "reasoning relevant only to long-run analysis." This is certainly in keeping with the views expressed here. But in his own analysis of Marshall's trade cycle he fails to point out the influence of the long-period perspective on Marshall's reasoning [Eshag (1963) pp.72-89 pp.137-141]. Bridel (1987 p.47) falls into a similar trap when he writes of "a clear cut dichotomy" in Marshall between long-period theory and trade-cycle theory; the former is called long-run or normal value theory by Bridel.

> ...[T]he crucial element to keep in mind is the total independence of the 'normal theory of value' from trade cycle theory. Bridel (1987) p.48 my brackets.

They fail to note Marshall's preoccupation with price-level changes through the trade cycle, a preoccupation fostered by Marshall's

ultimate acceptance of the quantity theory and its emphasis on the influence of a change in the money supply, however broadly defined, on the price level. Milgate (1982) is an exception; he writes of the Treatise's explanation of the trade cycle:

> ...[T]he conceptual framework of the traditional long-period method permeates almost every sentence. Milgate (1982) p.166 my brackets.

However, there is a critical problem in Milgate's long-period interpretation of the General Theory. This problem is relevant to the second set of arguments in the thesis; it will be taken up in a moment.

As the secondary literature described above suggests, the influence of a long-period framework built around the quantity theory and stationary- or steady-state conditions has not been fully appreciated in the literature. Nor has it been fully appreciated how much influence this theoretical perspective had on the discussion of short-period cyclical events or crises in Marshall (1923), Wicksell (1898), and Keynes (1930a&b). We will address these issues in some detail with a particular desire to critically assess the short-period explanations put forward by the three authors. That, then, is the first focus of this thesis.

The second set of arguments in the thesis presents the General Theory as a short-period theory based on a given state of long-term expectations. There is a view, recently emerging, that argues that the General Theory is a long-period theory; some writers argue that this was in fact Keynes' intention. Panico and Petri (1987) in their article "Long-run and Short-run" in the New Palgrave state:

> J.M. Keynes criticized the neoclassical conclusion that the market economy has as inherent tendency towards full

> employment. ...[H]e insisted that his concern was not the analysis of the temporary and cyclical fluctuations of the level of activity, but the theory dealing with the more fundamental forces which tend to prevail in the economic system. ...He wanted thus to replace the neoclassical long-period theory of the level of output with a new one [a new long-period theory]. Panico and Petri (1987) p.239 my brackets.

The textual references they cite for their conclusion are from a draft chapter for Keynes (1936), a note, and a lecture outline all written in 1932 when Keynes was still operating in the framework of the Treatise [CWJMK Vol.13 pp.405-407, Vol.29 pp.54-57]. As stated earlier I find that in the Treatise persistence or equilibrium of a state of the economy is defined as a long-period state; disequilibrium events exist in the short-period. Working within the Treatise's framework, but wishing to abandon its full-employment assumption, if Keynes had wished to analyze a suboptimal equilibrium state of the economy, he would have defined it as a long-period state.

A second line of approach to the establishment of a long-period analysis in Keynes (1936) relies on a quote directly from the General Theory [Eatwell (1979 p.98) Milgate (1982 p.87) Panico and Petri (1987 p.239)]. Keynes writes:

> ...[W]e oscillate, avoiding the gravest extremes of fluctuation in employment and in prices in both directions, round an intermediate position appreciably below full employment and appreciably above the minimum employment a decline below which would endanger life.
>
> But we must not conclude that the mean position thus determined by 'natural' tendencies, namely, by those tendencies which are likely to persist, failing measures expressly designed to correct them, is, therefore, established by laws of necessity. The unimpeded rule of the above conditions is a fact of observation concerning the world as it is or has been, and not a necessary principle which cannot be changed. Keynes (1936) p.254 my brackets.

What these writers fail to notice is that this passage comes at the end

of a section of the General Theory where Keynes is digressing on "the theory of business cycles" in a digression which he asserts is "not logically necessary" to his theory [Keynes (1936) pp.249-250]. He later writes that the cyclical regularity that is observed "in a given epoch" is due to cyclical change in the marginal efficiency of capital schedule, itself due to the durability of plant and equipment, "the carrying-cost on surplus stocks," and variations in the demand for working capital [Keynes (1936) p.313 pp.317-318].

The confusion that the long-period view of the General Theory harbors is a confusion generated by not recognizing that "classical" monetary theory's natural rate of interest, a product of stationary-state reasoning, has been transformed into the state of long-term expectations in the General Theory. In the General Theory, stability of the level of investment, given the interest rate, depends on the state of long-term expectations. In the Treatise, and in Wicksell (1898) and Marshall (1923), the level of investment, given the market rate of interest, depends on a long-period equilibrium interest rate referred to by Wicksell and Keynes as the natural rate. The natural rate of interest is a real rate of interest; it is effectively the rate which would be found, everything else held constant, if the economy were non-monetized. Further, it is generally thought to be independent of monetary disturbances, and therefore capable of acting as a stable point and center of gravity during disturbances. I argue that the role previously held by the natural rate in the earlier theories is transferred to the state of long-term expectations in Keynes (1936), but the state of long-term expectations is not securely

anchored in the real forces of the economy and can no longer act as a center of gravity to which the economy and economic behavior can conform. This is but a variation on my earlier argument that the role of stationary-state investment expectations has been transferred to the state of long-term expectations.

Strategy and Brief Outline

The thesis is organized to capitalize on the theoretical development and growing sophistication in monetary theory reflected in each of the three major "classical" works discussed. One of the novel features of the thesis is an argument showing that Marshall implicitly held a position akin to Wicksell's requiring a stationary long-period equilibrium for the quantity theory to hold and that Marshall, too, implicitly held a concept of the natural rate acting as a convergent point. This insight and the presumed joint influence of Marshall and Wicksell on the Treatise allows us to clarify the nature of the long-period equilibrium presented in the Treatise, and fold it into the monetary traditions of Marshall and Wicksell.

The three authors differ in their theoretical development and sophistication, but show substantive similarities in theoretical structure and perspective. The central point of divergence arises from the different capital traditions found in Wicksell on the one hand and Marshall and Keynes on the other. Once I have established a parallel theoretical core I can turn to Keynes' criticism of "classical" theory to establish the General Theory's significant contrasts and contributions.

I turn first to Marshall in Chapter One, then to Wicksell in

Chapter Two, then spend Chapter Three and Four on the Treatise, and finally close in Chapter Five with the General Theory's critique of "classical" monetary theory.

In the chapters on Marshall (1923), Wicksell (1898), and Keynes (1930a&b), I first interpret the authors' positions on money, savings, investment, the interest rate, and wages. Second, I analyze how those variables interact and motivate the behavior of economic actors, emphasizing the behavior of firms, the banking and financial system, and labor. Third, I interpret their notions of equilibrium and its relation to short-period and long-period analysis. Fourth, I discuss the authors' analyses of secular price trends, or, as they prefer, monetary cycles, and their analyses of trade cycles or crises. In each explication I ask a final question: Within the confines of the behavior described and the adjustments suggested is it possible to conceptualize a short-period equilibrium occurring under the authors' stated conditions?

The final chapter uses the General Theory to critically reflect on the theories outlined above. I am interested not only in Keynes' critical remarks, but also in the insights they provide as I attempt to analyze the nature of the General Theory's equilibrium and situate it relative to the "classical" monetary tradition, the tradition from which Keynes emerged.

Chapter One

Money, Credit, and Commerce: Marshallian Monetary Theory, Equilibrium, and Cycles

If we may be permitted to speak of Marshall's research program, then one area he left for his students to develop was an adequate theory of the trade or business cycle.

> These matters [industrial fluctuations], however, belong more properly to a volume which is designed to supplement Principles of Economics, Industry and Trade, as well as the present volume [Money, Credit and Commerce]. Marshall (1923) p.245 my brackets.

A theory of industrial fluctuations would have perhaps entered Marshall's next planned, but unwritten, volume, Progress: Its Economic Conditions, but his fading health leading to his death in 1924 precluded this [Keynes (1924) p.65].[1] It is possible by gathering up the scattered remarks made by Marshall, primarily in Money, Credit and Commerce, to piece together his thinking along these lines.[2] This chapter's final section will present Marshall's trade-cycle theory as well as a discussion of his theory of the price-level changes induced by a change in the money supply.

Much of Marshall's monetary theory has been discussed before, for

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[1] Interestingly, Keynes (1924 p.60) and Robertson (1959 p.9) refer to Marshall's planned volume by the title Money, Credit, and Employment; the parallels to the title of Keynes (1936) are apparent. Some of this planned volume appears to have been incorporated in Marshall (1923). Our interest is essentially in the Marshallian macro-foundations to the General Theory. On the Marshallian micro-foundations see Asimakopulos (1982).

[2] Wolfe (1956), Eshag (1963 pp.77-85), and Bridel (1987 pp.47-51) explicate Marshall's trade cycle, the latter two explicate other aspects of his monetary theory as well. All fail to discuss the possible integration of Marshall's trade cycle into these other aspects of his monetary theory.

example by Eshag (1963) and more recently by Bridel (1987). Here we would like to integrate Marshall's trade cycle and monetary theory into his methodological perspective as presented in the Principles. We are particularly interested in understanding what roles the short-period, the long-period, and the stationary state play in the monetary analysis. From which of these perspectives does Marshall analyze the quantity equation, the trade cycle, and the price level and its alterations, as well as their components and stimulating variables: savings and investing behavior, expectations, and the interest rate? Marshall (1923) is an example of pre-General Theory macroeconomic analysis, as it deals with aggregate movements, or attempted movements, in the price level, employment, investment, etc. Eshag (1963) has shown that Marshall's monetary theory forms the basis of much of Keynes' later work in the Treatise and the General Theory. Particular interest has been focused on the transition from the Treatise to the short-period equilibrium of the General Theory. In Marshall, as well as in the Treatise, the trade cycle handles disequilibrium short-period price-level fluctuations; to further our understanding of what constitutes the short-period and how its equilibrium in the General Theory may come about we return to Marshall's discussions in the same area.

Robinson (1973 p.89 p.xv) has argued that the General Theory "brought the argument down from the cloudy realms of timeless equilibrium" contained in the "timeless stationary state."[3] The premise is that Keynes, as a student of Marshall, started in the

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[3] Keynes (1936 p.146, 1937a p.107, 1937b p.112) makes similar remarks.

methodological tradition that Marshall had established, continuing with the problems that Marshall had left unresolved. We shall see that when Marshall applies his method of the Principles to his monetary theory, he employs a stationary-state model. In taking up Marshall's project on his way to his later work, Keynes adopted this methodological perspective, only to reject it in his later writings.

The transition from Marshall to the General Theory demonstrates itself most clearly through the Treatise. To further our understanding of Marshall's influence on the later works we will develop a series of Marshallian themes; they also, we argue, prefigure the general monetary framework that is required to understand Marshall's trade cycle and his discussion of inflation and deflation. The first section of this chapter, then, reviews the Principles' methodological perspective of periods. The second section describes Marshall's supply and demand for money, as well as the methodological context in which the quantity equation is valid. The third section presents his supply and demand for savings or "capital" and asks in what context their equilibrium occurs. The fourth and final section presents his theory of long-period and short-period price-level dynamics, and again attempts to connect the analysis to the methodological time frames presented in the Principles. We conclude that the quantity equation implies a long-period stationary state in Marshall's monetary framework, and that Marshall's trade-cycle analysis is not integrated back into the theoretical framework developed around the quantity equation. Marshall's unsatisfactory explanation of the trade cycle and his unsatisfactory development of the macroeconomics of the short-

period was an area left for consideration by Marshall's students and successors.

Marshall's "Statical Method"[4]

In this section we tackle the question of Marshall's methodological device of periods: the market period, the short-period, the long-period, and the secular period [Marshall (1920) pp.314-315]. Marshall's Principles introduces and uses this terminology and Marshall carried much of it over into his Money, Credit, and Commerce. The latter is the source of our forthcoming discussion of money and related matters; a clear understanding of the discussion requires that we delineate Marshall's methodological perspective. One question we have to address is the extent to which the terminology retains its meaning between the texts. Later, we will find ourselves returning to the Principles' perspective when we approach the writings of Keynes. Along with the four periods listed above three other topics will come to light in this section: Marshall's use of a stationary state; his use of normal, market, and average values; and his use of the phrase 'in the long run.'

Normal values, for example normal prices, arise out of normal conditions -- the background conditions which are assumed for most of Marshall's theoretical supply-and-demand analysis.

> ...[W]e are investigating the equilibrium of normal demand and normal supply in their most general form...Thus we assume that

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[4] Davenport (1935) and Reisman (1986) both also discuss Marshall's statical method. Davenport emphasizes the role of the stationary state as I do here. Reisman emphasizes Marshall's discussion of expectations and argues for a predominate role for an uncalculable uncertainty in Marshall's market process. Reisman's position, as will become clear, is not one argued for here.

> the forces of demand and supply have free play; that there is no close combination among dealers on either side, but each acts for himself, and there is much free competition; that is, buyers generally compete freely with buyers, and sellers compete freely with sellers. But though everyone acts for himself, his knowledge of what others are doing is...generally sufficient to prevent him from taking a lower or paying a higher price than others are doing. ...[T]his is the supposition on which we proceed...there is only one price in the market at one and the same time... Marshall (1920) p.284 my brackets.

Marshall does consider noncompetitive situations and in such situations the above conditions are altered, but in the competitive case the above are operative. The equilibrium price which emerges given the background conditions is called the 'normal price'; it is to be contrasted with "'current' or 'market' or 'occasional'" prices "where accidents of the moment exert a preponderating influence" [Marshall (1920) p.vi p.30 p.289]. Normal prices in the competitive context are not synonymous with competitive prices, since momentary accidents or temporary forces are operative in competitive markets. It is for the purpose of controlling for the temporary forces and analyzing a prescribed set of forces that Marshall devised his period analysis.

> Of course Normal does not mean Competitive. Market prices and Normal prices are alike brought about by a multitude of influences, of which some are competitive and some are not. It is to the persistence of the influences considered, and the time allowed for them to work out their effects that we refer when contrasting Market and Normal price... Marshall (1920) p.289.

The "influences considered and the time allowed" are specified in each of Marshall's time periods. Each of these periods represent a second condition superimposed on the background conditions.

Marshall states that the "chief cause of...difficulties in economic investigations" is the passage of time [Marshall (1920) p.304]. This

is because "disturbing causes" in historical time interfere with the clear view of the causes under consideration. Marshall proposes that economists proceed using an analytical model as if it were a controlled experiment. The tools he uses are ceteris paribus as the controlling factor and the stationary state as the initially controlled experimental environment. The method leads an investigator

> ...to go step by step; breaking up a complex question, studying one bit at a time, and at last combining his partial solutions into a more or less complete solution of the whole riddle. ... The study of some group of tendencies is isolated by the assumption other things being equal: the existence of other tendencies is not denied, but their disturbing effect is neglected for a time. Marshall (1920) p.304.

The "breaking up" is produced through the "partial studies" of the market, short, long, and secular periods, but each premised on the stationary state [Marshall (1920) p.307].

> By that method [statical method] we fix our minds on some central point: we suppose it for the time to be reduced to a stationary state; and we then study in relation to it the forces that affect the things by which it is surrounded, and any tendency there may be to equilibrium of these forces. Marshall (1920) pp.306-307 my brackets.

The type of forces that are let loose are conveniently catalogued in the four periods which we will review in a moment.

Marshall's stationary state consists of the following attributes:

> ...[I]n it [the stationary state] the general conditions of production and consumption, of distribution and exchange remain motionless...The average age of the population may be stationary...And the same amount of things per head of the population will have been produced in the same ways by the same classes of people for many generations together; and therefore this supply of the appliances for production will have had full time to be adjusted to the steady demand. ...[T]he plain rule would be that cost of production governs value. There would be...no fundamental difference between the immediate and the later effects of economic causes...no slack times, and no specially busy times...normal price would never vary. Marshall (1920) pp.305-306 my brackets.

Further in the stationary state, "[I]ncome earned by every appliance of production" is "anticipated beforehand," so that expected results are realized [Marshall (1920) p.667]. The stationary state as described is static; all relationships between variables "are reduced to rest," albeit a state of rest that reproduces itself [Marshall (1920) pp.305-306]. It epitomizes the statical method. Marshall remarks that its characteristics can be transformed to a steady state, "where population and wealth are both growing," if the qualitative relationships remain the same, but he leaves this aside undeveloped [Marshall (1920) p.306].

Having at hand the background normal conditions, which are essentially and usually the conditions for a competitive market, and a benchmark in the form of the stationary state from which the analysis can proceed, Marshall introduces controlled disturbances through his various periods. In the market period supply is assumed to be fixed, limited to that "which is on hand, or at all events 'in sight'" [Marshall (1920) p.314]. He gives an example, holding everything else constant in a stationary state, of the "day to day oscillations in the price of fish" due to weather altering their supply [Marshall (1920) p.307]. He calls market-period prices 'market prices' due to their close resemblance to the daily price fluctuations found in some actual markets, such as fish and grain markets, but they are hypothetical prices determined as if one price ruled on the "market day" [Marshall (1920) pp.277-278 p.314 p.307 p.411].

Normal prices emerge from the next three periods at the "equilibrium of normal demand and normal supply" [Marshall (1920) p.282]. In the short-period, supply is limited by "the existing stock

of plant, personal and impersonal" [Marshall (1920) pp.314-315].

> The supply of specialized skill and ability, of suitable machinery and and other material capital, and of the appropriate industrial organization has not time to be fully adapted to demand; but the producers have to adjust their supply to the demand as best they can with the appliances already at their disposal. Marshall (1920) pp.312-313.

Again following Marshall's fish market example, he supposes a "cattle plague" raises the demand for fish, presumably due to price substitution effects, and leads the fishing industry to bring into use its moth-balled ships as the augmented demand "raises the normal supply price" [Marshall (1920) pp.307-308]. The "expectation of a high price," a high price that is not due simply to day-to-day events, calls forth a greater supply, but no expansion of available facilities [Marshall (1920) p.311]. The realization of the higher expected price through sales, which would be a requirement of a short-period equilibrium, is not permanent, since the changes which induced it are not of a permanent nature. We would not anticipate that the new price level would become an element of a stationary state; it is as impermanent as its cause. Marshall does not address the price actually realized after the expansion of output, nor the economy's position relative to the stationary state. The whole question of a stationary state falls by the wayside as Marshall proceeds in his description of the short-period. But after firms "adapt their production to changes in demand" given their existing capabilities we may assume the realized price and the expected price are equal in the short-period equilibrium [Marshall (1920) p.412].

The expansion of available capacity occurs in the long-period. In this case

> ...Supply means what can be produced by plant, which itself can be remuneratively produced and applied within a given time... Marshall (1920) p.315.

> In the long periods...all investments of capital and effort in providing the material plant and the organization of a business, and in acquiring trade knowledge and specialized ability, have time to be adjusted to the incomes which are expected to be earned by them... Marshall (1920) p.313.

The change in demand leading to the change in the long-period supply is effectively seen by entrepreneurs as permanent, such as "a permanent distaste" for meat raising the demand for fish, to continue Marshall's example [Marshall (1920) p.308]. Like the short-period adjustment in output, it is the expectation of income or price that leads both to the change in plant and equipment in the long-period and to the long-period normal price. Unlike the short-period adjustments, the altered long-period conditions of supply and its normal price are permanent in nature. Marshall notes that "a theoretically perfect" long-period leads to a stationary state, although a new one, after all the effects of the changed permanent demand have reverberated through the industries and markets supplying the initiating market, as well as through the markets supplying these markets and their factors of production [Marshall (1920) p.315 fn.1]. The "logical consequences" of this are "a stationary state of industry" and a complete knowledge of future values, presumably lasting as long as the state remains unaltered [Marshall (1920) p.315 fn.1]. Clearly realized prices equal expected prices.

Finally we have the secular period.

> ...[T]here are gradual or <u>Secular</u> movements of normal price, caused by the gradual growth of knowledge, of population and of capital, and the changing conditions of demand and supply from one generation to another. Marshall (1920) p.315 my brackets.

Presumably if we stopped the permanent secular development in its path, in a moment in time, we would be analyzing a long-period.

Notice that the events that alter equilibrium values, whether short-period values or long-period stationary-state values, are of an exogenous nature: weather, sickness, and changes in taste. We will find the changes in the state of entrepreneurial confidence that initiate the trade cycle also are exogenously determined, that is, determined independently from the economic variables contained within the theory's framework. The turning point of the cycle from a slump is not explained by Marshall's theory as presented, just as he does not explain the weather. In consequence of this, first, we will find it difficult to situate Marshall's trade-cycle theory in his monetary framework. Second, we will find Keynes in the Treatise, who borrowed heavily from Marshall's monetary theory, struggling to integrate the trade cycle, a struggle which leads to a rather contrived scenario. Finally, we will find in the General Theory, where Keynes adopts in a more general manner Marshall's methodological framework, aspects of the theory whose motivations rely on exogenous events that are not explained, for example the demand for investment goods.

We need to raise a few final points of clarification before closing this section; these points will become important when we investigate Marshall's monetary and trade-cycle theories. Marshall notes that classical economists, such as Adam Smith, had a notion similar to his stationary state in their phrase 'in the long run.' To them, the "normal, or 'natural' value of a commodity"

> ...is that which economic forces tend to bring about in the

> long run. It is the average value which economic forces would bring about if the general conditions of life were stationary for a run of time long enough to enable them all to work out their full effect. Marshall (1920) p.289.

Marshall is paraphrasing the classical perspective in this quote, and he refers us, through a footnote attached to this passage, to his above-quoted discussions of the stationary state. His own use of the phrase 'in the long run' usually points to a hypothetical passing of time sufficient to bring about normal values under "the dominance...of certain tendencies under given conditions" [Marshall (1920) p.31]. The "given conditions" in which we find Marshall using the phrase are those of the long-period; for examples the reader is referred to Marshall (1920 pp.313-314 p.378). Thus, in reference to price, the phrase 'in the long run' usually refers to the long-period equilibrium normal price.

Some caution is required though, since there are times where Marshall uses the phrase to imply the passage of real or historical time [Marshall (1920) p.69 p.312, (1923) p.93 for examples]. In these contexts if it refers to price, then the usage conforms more to his idea of an average price which may be taken over "any set of sales" for any time-span or "at any time in many markets" [Marshall (1920) p.309]. In the averages are included all the fluctuations of the actual market prices "in general conditions of life" which are not stationary [Marshall (1920) p.289 Smith (1776) p.55]. Only in a stationary state would the average price equal the normal price [Marshall (1920) p.309]. Of course in the stationary state there is "no distinction between long-period and short-period normal values" [Marshall (1920) p.305]. As stated above the discussion of the meaning

and of the usage of long run and average values will become important when we consider some aspects of Marshall's monetary and trade-cycle theories. As well, our discussion of the short-period, the long-period, and the stationary state will have relevance. It is to the subject of Marshall's monetary theory and his trade-cycle theory to which we now turn.

The Supply and Demand for Money

Although Marshall considers the term 'money' to be somewhat elastic he classifies under it

> ...all coined money, issued by competent authority, and free from injury by "clipping" or otherwise...notes printed on paper, and issued by Government or other competent authority: under the latter head may be included notes issued by banks under official supervision; [and] notes issued by other banks which are in good repute, serve the same purpose in ordinary times. Marshall (1923) p.12 my brackets.

Money above is in effect currency, but Marshall speaks of bills of exchange and checks as possible alternative media of exchange [Marshall (1923) pp.15-16]. This points up Marshall's view of the necessity for an elastic view of what constitutes money. Further, by introducing bills of exchange he merges money and credit. Acceptance of a bill of exchange in a transaction represents a personal or private loan and when discounted through the banking system for currency or a demand deposit it transfers the lending to the banking system. We will see that Marshall wants to assign a different status to money proper or currency than to credit in his discussions of price-level dynamics, but at this stage the distinction is not clearly drawn. In general when Marshall speaks of the demand for and the supply of money he is referring to coin and bank notes. At times, though, he refers to

"ready purchasing power" not only as currency, but also as what is available to individuals on "current account in a bank," and so would include checking or demand- deposit accounts in his classification of money [Marshall (1923) p.44 also see p.39 pp.44-47 p.228].

Marshall assigns to money two functions; it is a medium of exchange and a standard of deferred value for contracts [Marshall (1923) pp.15-17]. The "money of account" function is mentioned but not made central; we must assume this function of money is implicit in the other two functions, particularly the standard of deferred value [Marshall (1923) p.269]. The first function, medium of exchange or means of payment, reflects money's role as a facilitator of transactions "that are completed almost as soon as they are begun" [Marshall (1923) p.16]. The second relies on money having a stable value over time; that stable value "is the one essential condition" [Marshall (1923) p.16]. Instability of value in the currency generates "great evil" through speculative booms and busts with consequences for production and employment [Marshall (1923) pp.17-19]. One important aspect of an adequate theory of price-level dynamics is to formulate policy to moderate or eliminate this evil. Marshall also describes the second function as arising from the requirement for "a store of value for long-period contracts," a unique usage of the store-of-value function of money usually associated with hoarding [Marshall (1923) p.16]. The hoarding of "precious metals" Marshall relegates to foregone eras; savings in the form of government bonds, "other familiar stock exchange securities" or accounts "to the charge of the banks" have replaced the hoarding function of currency [Marshall (1923) p.46].

> ...[B]y far the greater part of the currency, which is held in private hands, is designed as provision against some occasion for its use as direct purchasing power in the not very distant future. Marshall (1923) p.46 my brackets.

The hoarding or store-of-value function of money is taken over by income-generating investments. We might add that in the extreme, when it is anticipated that securities will lose value, hoarding can be taken over by savings deposits "to the charge of the banks." We will see it is precisely such a position that Keynes presents in the Treatise in his discussion of bull and bear speculative interaction and which he extends to consider the interaction's effect on the market rate of interest [Keynes (1930a) pp.127-130].

The determinants of the money supply will clearly depend on what falls under the category of money. If we take money in the narrow sense of coin and bank notes, with the latter determined by the periodic public loans to the government, which led to the founding of the Bank of England, plus gold reserves to back note issues, then the amount of money as currency in the economy is regulated by the inflow and outflow of gold reserves and the existing founding loans to the government [Robertson (1922) pp.47-68, Dunbar (1917) CH.8]. If we include in the definition of money, as Marshall sometimes does, demand deposits and bills of exchange, then the gold-backed exogeneity of money breaks down. Loans can be granted through the banking system simply by creating demand deposits; bills of exchange, at least for local transactions, can circulate as a medium of exchange, if not discounted for demand deposits [Marshall (1923) p.249]. Should the increased demand deposits call for more bank notes and coin, the respective banks can run down their held reserves; the English reserve

ratio was set by convention, not law. Marshall does not anticipate checking accounts to call forth a greater demand for currency; the holder of a check or "bank money," as Marshall prefers to write, "seldom desires to draw any considerable quantity of currency" [Marshall (1923) p.15]. The same flexibility of the reserve ratio inhibits the braking power which gold reserves might have over the expansion of demand deposits through expanded lending, not just over expansion through the discounting of bills. So, not only is the definition or classification of money elastic, but its supply too is elastic. The elasticity of the money supply in its aspect as credit will become important in Marshall's discussion of the trade cycle. In fact he presents different price-level dynamics engendered by expansion or contraction of gold-based versus credit-based money. Through the first, gold-based, he analyzes long-period sustainable price-level alterations. Through the second, credit-based, he analyzes short-period industrial fluctuations and price-level cycles. We will enter into his distinctions in a later section.

Marshall's demand for money resembles the General Theory's transaction motive and precautionary motive to hold money [Keynes (1936) pp.195-196]. Although there is also an element of the speculative motive present, property or wealth enters as a factor determining the demand for money. Property or wealth is not fully integrated by Marshall into his credit- or trade-cycle theory where it would be relevant; for example, he does not address the impact of an increased demand for currency or bank deposits due to bearish security-market sentiments on the banking system's lending capacity.

The integration of the banking system, the security market, and individuals' motives to hold money was, of course, performed by Keynes, first in the Treatise and then again in the General Theory [Keynes (1930a) pp.127-130 pp.222-230, (1936) pp.166-172 pp.205-208].

The demand for money or for "ready purchasing power" derives first from money's "convenient form" and that it "renders business easy and smooth" [Marshall (1923) p.38 p.45]. Further, holders of ready purchasing power are "at an advantage in bargaining" [Marshall (1923) p.45].

> ...[W]hen a man has spent or invested nearly all the money which he commands...in consequence [he may have] failed to take advantage of a good bargain which came within his reach. Or he may have been forced to buy from retailers who charged him high prices and delivered inferior goods, being fortified by the knowledge that if he raised objections, he could be brought into subjection by a hint that he must pay up quickly. Marshall (1923) p.44 my brackets.

Essentially we have money held for transaction purposes and for precautionary bargain hunting and bargaining purposes. The benefits of money balances to an individual consumer or entrepreneur derived from those uses are to be compared to

> ...the benefits...which he would get by investing some of it [the stock of currency] either in a commodity -- say a coat or a piano -- from which he would derive a direct benefit; or in some business plant or stock exchange security, which would yield him a money income. Marshall (1923) p.39 my brackets.

In keeping with Marshall's marginalist tradition, the incremental benefits from "enlarging his stock of currency in hand" are weighed against the incremental benefits of immediate consumption or income-generating investment [Marshall (1923) p.39 my underlining]. Presumably in the latter it is ultimately the real-income stream which is important, not the money-income stream. Real income or real

consumption benefits would bring the comparisons into conformity with the underlying reason for holding transaction and precautionary balances.

> ...[D]emand [is] not for a certain amount of metallic (or other) currency; but for an amount of currency which has a certain purchasing power. Marshall (1923) p.39 my brackets.

The 'purchasing power' of money signifies the real value of money in terms of the commodities "which are in fact consumed" [Marshall (1923) p.21]. In Marshall then we have a transaction and a precautionary demand for real money balances determined by comparing the marginal benefits of holding real purchasing power against the marginal benefits of immediate consumption or of investment for future consumption.

Marshall gives "definiteness" to his ideas through an example where after each individual considers the benefits and losses of holding purchasing power,

> ...the inhabitants of a country, taken one with another (and including therefore all varieties of character and of occupation) find it just worth their while to keep by them on the average ready purchasing power to the extent of a tenth part of their annual income, together with a fiftieth part of their property...the aggregate value of the currency of the country will tend to...equal the sum of these amounts. Marshall (1923) p.44.

It is interesting to note that property or accumulated wealth as well as income is a determinant of money demand. This becomes important if we consider the interactions between the banking system and the security market operating through Marshall's bear and bull sentiments. The role of property in the demand for money and Marshall's analysis of the security market, in which securities are one form that property can take, are suggestive of the origins of the General Theory's liquidity preference theory of the interest rate. The synthesis leading to

liquidity preference is not performed by Marshall, but is begun in Keynes' Treatise. Through Marshall (1923) we receive an inkling of a role for accummulated assets or wealth in whatever equilibrium process is considered.

On Marshall's own terms, how are the demand and the supply of money linked to the demand and the supply of securities? We should say at the outset that Marshall does not fully answer this question. Marshall defines the 'money market' as the market for short-term loans or "advances of money" lent at a discount rate or a rate of interest particular to "short period loans" [Marshall (1923) p.14 p.78]. The loans appear to range in duration from overnight to a few months with varying discount rates or "terms."

> ...[I]t is convenient for the purposes of the Money Market to speak of the amount of ready command over money that bankers and others are inclined to lend on any of these terms, as the "amount of money" that is available for it. Marshall (1923) p.14 fn.2.

Short-period credit is given on the basis of titles to property, stock exchange securities, and the banker's knowledge of "the personal character of the borrower" [Marshall (1923) p.78]. In contrast the stock exchange deals in "long period credit," which takes the forms of 1) ordinary and preferred shares granting ownership and of 2) debentures: "acknowledgment of debt paying a fixed rate of interest." The term 'securities' encompasses both shares and debentures [Marshall (1923) pp.78-79]. Debentures or bonds may be issued by either firms or the government [Marshall (1923) p.91]. The "normal rate of interest on fairly secured permanent loans" or "the mean rate of interest for long loans" is distinguished from the rate of discount, and the former is

essentially determined by the supply and demand for savings [Marshall (1923) p.79 p.255]. The supply of and the demand for savings are the subject of the next section. We might note that Marshall holds that the security market is a "stimulus" to an individual's propensity to save; its "variety of stock exchange investments" allows choice in the degree of risk assumed while generating income [Marshall (1923) pp.91-92]. The decision to save is not simply a decision not to consume, but also a decision of what form the savings will take. We will see that it is precisely such a conception of savings that motivates Keynes' discussion of bear and bull security-market sentiments in the Treatise [Keynes (1930a) pp.127-130].

The interest rates on short-period loans and long-period loans are determined by different markets, which are in turn defined essentially by the duration of the credit instrument involved. The markets operate simultaneously and, as we will see, they interact. The terms 'short-period' and 'long-period' in this context appear to simply signify that the duration of the credit agreements are tied to their different functions in the economy. The terms also refer us back to the methodological precepts outlined in the Principles, but Marshall leaves this reference unexplored. Marshall does tell us in the Principles that after proceeding "step by step" with the periods analysis an economist can draw together the conclusions

> ...at last combining his partial solutions into a more or less complete solution of the whole riddle. Marshall (1920) p.304.

The forces segregated for the purpose of the period analysis are operative simultaneously in actuality and can be conceptually superimposed. Further, and in keeping with the notion that money or

credit is a facilitator of both current transactions and transactions planned for the future, there is no reason to think that distinct financial markets would not grow up around the different forces and accommodate their financial needs.

The short-period forces are identified by Marshall with impermanent alterations in short-term conditions of supply and demand, for example his "cattle plague" and its effect on the supply and demand of fish. The long-period forces are identified with permanent alterations in the conditions of supply and demand due to changes in the fundamental structure of tastes, production, communication, and distribution, for example a rise in the demand for fish and the productive facilities of their supply due to the "growth of a high-strung artisan population" [Marshall (1920) p.307]. We can conceive of short-period credit accommodating the needs of normal turnover and short-period fluctuations, for example working capital that might be used to meet wage bills and bills for intermediate goods and to expand the output of given facilities [Marshall (1923) pp.17-19]. Long-period credit, in the form of securities, accommodates the needs of large-scale business organizations for investable funds [Marshall (1923) p.78], funds that can be used as the conditions warrant for both maintaining plant and equipment and for net investment.

The institutions of the money market and the security market serve purposes parallel to Marshall's methodologically designed periods, and they are where the monetary ramifications of the forces he identifies are played out. We shall find that in stable periods Marshall posits that the long-period interest rate determines the short-period interest

rate; they are equal except for differences arising from differing loan durations and the potential uncertainties attached to long lending. In the real world the potential uncertainties always exist, so that even in stable times this difference remains. But the near equality, an equality undermined only by uncertainty about the future, refers us back to a stationary state approximated by stable conditions and the equality of short-period and long-period normal or equilibrium values. The normal values now under discussion, of course, are the short-period and the long-period interest rates. In the real world the potential uncertainties become actual; fluctuations in output, employment, prices, and the interest rates occur; this leads Marshall to speak of "the mean rate of interest on long loans," "the mean rate of discount," and in another passage "the average rate of interest" which in the context applies to long loans and is contrasted with the discount rate [Marshall (1923) p.255 p.258]. The intrusion of the real world implies there is no long run, but Marshall analyzes the world from the perspective of his periods, particularly his long-period, and we see his perspective peaking through in his terminology: 'short period loans,' 'long period credit,' and the 'normal rate of interest.'

According to Marshall the connecting link between the money market and the security market is the positioning of bull and bear speculators. Bulls are taking their position in securities through borrowing short-term money-market funds at the current rate of discount in anticipation of rising security prices. Marshall is a little less clear on what exactly bears are doing, but they can be presumed to be taking short-term liquid positions, lending, either directly or

indirectly, their funds through the money market which includes the banking system. As Marshall explains, among the bulls and bears are always individuals "on the margin of doubt, whether to continue or not" and they will take their cue from movements in the rate of discount [Marshall (1923) pp.258-259]. An upward movement in the discount rate turns marginal bulls to bears; a downward movement in the discount rate turns marginal bears to bulls. As Marshall explains, in a somewhat contradictory manner, those who borrow to speculate will "reduce their holdings of all marketable things" with an increase in the discount rate and the long-term interest rate. "Marketable things" include "cotton, wheat, copper, etc." and securities whose prices will fall with the higher discount rate [Marshall (1920) pp.251-252]. Bull speculators are turning bearish we would suppose. But we are told securities "are held semi-speculatively" due to the income they generate in periods of high interest rates, when prices are not expected to rise, so that "a slight increase in profit" in commodity speculation due to a change in conditions -- a fall in the discount rate -- reduces the holdings of securities. We seem to have two contradictory forces presented and we sense that securities are predominately bonds. Further, a small bearish movement due to a rise in the discount rate may develop into a "panic" of selling, driving the security prices down [Marshall (1920) p.259].

The actual possibilities are not well explained by Marshall; neither is the banking sector's reaction and its effect on the discount rate. We will see that Keynes in the Treatise offers an explanation claiming that, with the banking system's reserve assets fixed, an

outbreak of bearishness raises the level of savings deposits supported by the given banking reserves, slows the velocity of circulation, and drives the lending rate higher. The latter feeds the bearish sentiments [Keynes (1930a) pp.223-228]. Keynes' analysis is of the mechanism of change once initiated; as it stands it does not tell us what determines the initial level of the discount rate. Both Keynes and Marshall turn to the determinants of the long-period interest rate to understand the discount rate; it turns out that the short-period interest rate fluctuations, discount rate fluctuations, are anchored by the long rate. Their theories of the long-term rate of interest are tied to the analysis of the supply and demand for savings at full employment. We will approach Marshall on this topic in a moment.

Marshall tops off his analysis of the supply and demand of money by introducing the quantity theory of money. Everything else held constant,

> ...there is a certain volume of their resources which people of different classes...care to keep in the form of currency; and...there is a direct relation between the volume of currency and the price level, that, if one is increased by ten per cent., the other also will be increased by ten percent. ...[T]he less the proportion of their resources which people care to keep in the form of currency,...the higher will prices be with a given volume of currency. Marshall (1923) p.45 my brackets.

The "Quantity doctrine" as Marshall calls the quantity theory "is helpful as far as it goes," but he criticizes its proponents for neither stating what must be held constant for it to hold nor explaining what determines the velocity of circulation [Marshall (1923) p.48]. On the velocity of money or its "efficiency" Marshall is not exactly clear himself, and presumably it is altered by advances in

transportation and communication, and the development of check-clearing houses [Marshall (1923) p.45 p.48 pp.86-87]. Marshall lists several factors which lie behind the ceteris paribus clause: population, wealth, aggregate income, the state of development of credit or money substitutes, the state of development in "transport, production, and business generally which affect the number" of exchanges of a commodity before it reaches its final buyer,

> ...the amount of business transacted per head of the population...the percentage of that business which is effected directly by money... Marshall (1923) p.48,

and finally the velocity of circulation [Marshall (1923) p.45 p.48]. These factors resemble, if not mimic, the conditions that determine Marshall's long-period stationary state. Changes in these factors lead to permanent changes in the quantity theory's posited relationship between the money supply and the level of prices; they lead to long-period normal price adjustments, independently of any change in the money supply. The relationship be "temporarily modified by fluctuations of general commercial confidence and activity," that is, by changed expectations of price and output levels and by changed actual levels [Marshall (1923) p.45]. Short-lived alterations in demand lead to nonsustainable price-level movements which, if frozen in time, would presumably reveal short-period normal prices.

To anticipate our discussion slightly, fluctuations in economic activity are the subject of Marshall's trade cycle and require an analysis of the necessary, but temporary, modifications of the quantity theory. That is, they require an analysis of periods where the quantity theory does not hold; Marshall refers to such periods as

times of "short-period" price and output fluctuations. Marshall is unsuccessful in connecting the short-period changes back up to the quantity theory and its stationary conditions, a point we will raise later. Short-period fluctuations are to be distinguished from "long-period" price fluctuations due to an alteration

> ...in the amounts of the precious metals relatively to the business which has to be transacted by them...Marshall (1923) p.19.

Marshall virtually ignores fluctuations in output in the context of long-period price-level dynamics, but states that long-period price adjustments can be punctuated by cycles of boom and bust, "broken by cyclones of distrust" [Marshall (1923) pp. 256-257, (1926) p.274], which lead to fluctuations in the level of output due to changes in the above "commercial confidence" [Marshall (1923) p.45 also see pp.17-19].[5] Uninterrupted long-period price-level changes would occur if the conditions that coincide with those of the quantity theory and the stationary state prevailed uninterrupted; money is then a veil. The actual mechanism lying behind the long-period or quantity equation price-level changes depends, first, on the transaction and precautionary demands for money and, second, on the relationship between the short-period rate of interest charged by the banking system or the money market and the availability of credit relative to the long-period interest rate determined by the supply and demand for savings. We now turn to the supply and demand for savings.

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[5] Marshall and Marshall (1879 pp.151-152) give a series of historical examples of crises, alterations of output and employment, occurring between 1850 and 1873 in the midst of an expansion in the stock of "precious metals" and a long-period price-level increase.

The Supply and Demand of Savings

The supply and demand of savings determines the "rate of interest for long loans" operative in the security market. The demand for savings is determined "by the needs of business for capital"

> ...which is determined by the extent and the richness of the field for the investment of capital... Marshall (1923) p.255

The supply of savings, "loanable capital" or "capital free for investing," is given by "the actual excess production over consumption" [Marshall (1923) p.73 p.79 p. 257]. In the Principles Marshall tells us that "Consumption may be regarded as negative production" [Marshall (1920) p.53]. And he tells us that

> ...production of material products is really nothing more than a rearrangement of matter which gives it new utilities...[C]onsumption of them is nothing more than a disarrangement of matter, which diminishes or destroys its utilities. Marshall (1920) p.54 my brackets.

Further, he implies that consumption is the consumption of both consumer goods and producer goods, since the latter "distinction...is...not of much practical use" [Marshall (1920) p.54]. Savings apparently is net savings and we must assume that the monetary demand for the "free" capital is also a net demand. Although Marshall is unclear on this last point, it is certainly in keeping with his view of the development of the English economy that net investment is occurring [Marshall (1920) pp.556-573]. He does give an example of the interaction of the demand and the supply of savings where with the supply of free capital increasing and "in spite of a great widening of the field of investment" the interest rate on long loans is forced down [Marshall (1923) p.255]. The net savings rate is growing faster than the net investment rate so that at any moment in time the equilibrium

interest rate is reduced.

In general the interaction of the supply and demand of savings, presumably at least in part mediated by the securities market, leads to an equilibrium position.

> Equilibrium is found at that rate of interest for long loans...which equates supply and demand. Marshall (1923) p.256.

But what is the nature of this equilibrium? It does not easily fit into the categories we have so far discussed. Long-period changes are to be approached in a statical or comparative static manner, looking at the effect on normal values of permanent changes in the conditions of supply and of demand, not of an ongoing change in the conditions of supply, as would be the case with net investment occurring. We might rather artificially assert a dynamic stationary state, a steady state; a situation where net savings matched net investment, but in such a manner that the fundamental relationships between consumption, production, distribution, and communication remain unaltered, leaving normal values constant including the interest rate. In supposing this we are trying to give a context in which the supply and demand for savings can operate. Marshall will supply his own context in his discussion of price-level dynamics, the subject of our next section. As it turns out, the context he supplies is that of the quantity theory, essentially that of a static stationary state with no net investment or net savings occurring. In this context the monetary interest rate on long loans is equal to an equilibrium long-period interest rate determined by the real forces of savings supply and investment demand.

Money, Credit, and Commerce brings in the discount rate by adding,

> It is obvious that the mean rate of discount must be much under the influence of the mean rate of interest for long loans. ... Marshall (1923) p.255.

or

> The rate of discount is determined by the average profitableness of different business; that is, determined partly by the amount of capital that is seeking investment as compared with the openings for new docks, new machinery, and so on... Marshall (1923) p.75.

The equilibrium long rate has a "corresponding" equilibrium short rate or discount rate, though they are not necessarily equal, presumably due to varying degrees of liquidity, risk, and duration attached to the loans [Marshall (1923) p.256]. The correspondence must come about though the money market's linkage to the securities market; we have seen above that the connecting link is the behavior of bears and bulls. We have also suggested that the interaction between the money market or the banking system and bulls and bears is not well-developed by Marshall. The linkage between the discount rate and the long-term rate is therefore not well-developed either. At Marshall's posited equilibrium short rate we must assume that the bull and bear positions somehow balance, and that they balance in conformity with the dictates of the equilibrium "average profitableness of business in general" [Marshall (1923) p.258].

It is interesting to note that in Marshall's discussion of the savings decision, in neither Money, Credit, and Commerce (1923) nor Principles of Economics (1920), are fluctuations in the level of income, output, and employment made a consideration. This became an important point of criticism that grew out of the Cambridge Circus'

reading of the Treatise and is thought to have spurred Keynes toward the General Theory [CWUMK Vol.XIII pp.339-340 p.342].[6] Marshall makes savings a function of the level of income in suggestive passages such as this:

> ...[S]urplus of production over the necessaries of life...gives the power to save. Marshall (1920) p.186 my brackets.

But throughout Marshall's discussion of savings it is implicitly the full-employment level of income from which these savings arise. Symmetry or comparability would require that demand, or investment, be on the same footing. The equilibrium interest rate on long loans or the long-period interest rate determined above is a full-employment equilibrium rate.

We might take a moment to investigate the factors outlined in the Principles that underlie individuals' savings and investing behavior, substantiating what role income, output, and fluctuations play, as well as investigating the nature of the equilibrium interest rate that is determined.

We have already noted the dependence of savings on income. In a similar passage Marshall writes,

> The power to save depends on an excess of income over necessary expenditure; and this is greatest among the wealthy. Marshall (1920) p.190.

The "social and religious sanctions" of particular times and regions, the degree of regional or national "security," plus the level of economic development motivate individuals to save for the sake of "old

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[6] Eshag (1963 p.50) points to Marshall's overlooking fluctuations in output and income.

age" and "family affection," and define "man's prospectiveness; that is, his faculty of realizing the future" [Marshall (1920) pp.187-193]. Marshall points to the "modern methods of business," particularly the development of "trustworthy savings-banks" as having "induced some people [to save] who would not otherwise have" [Marshall (1920) p.189 my brackets]. Along with the social and economic factors, including the level of income, Marshall identifies the interest rate as a motivating force to savings.

> ...[T]he deferring of a gratification necessarily introduces some uncertainty as to its ever being enjoyed; and secondly, that, as human nature is constituted, a present gratification is generally, though not always, preferred to a [deferred] gratification that is expected to be equal to it...[W]e are justified in speaking of the interest on capital as the reward of the sacrifice involved in the waiting for the enjoyment of material resources, because few people would save much without reward... Marshall (1920) pp.192-193 my brackets.

Marshall notes that a rise in the interest rate may lead those individuals who save for a fixed future income to lower their "annual rate of savings" [Marshall (1920) pp.195-196], but in general an increase in the interest rate, "in the demand price for savings," increases the level of savings [Marshall (1920) p.196 p.443].

The savings behavior of individuals that is under discussion in the Principles is taken over uncritically to the macroeconomic discussion of Money, Credit, and Commerce, so that the impact of alterations in the level of income or of alterations in the level of investment on the aggregate savings level is not considered. In fact, in the Principles Marshall suggests we wait until the "theories of money, credit and foreign trade have been discussed," the subjects of Money, Credit, and Commerce, before we assess the impact of "temporary

fluctuations" on "normal earnings," that is, the business cycle causing subnormal and above-normal earnings [Marshall (1920) pp.514-515]. The relation between the business cycle, earnings, and savings is not raised in the later volume. This leads us to conclude that an implicit full-employment assumption underlies Marshall's discussion of savings as well as his equilibrium long-term interest rate.

We have already noted above that the demand for investable resources depends on "the extent and richness" of available investment opportunities. In the Principles Marshall has written that the "demand for capital arises from its productiveness" [Marshall (1920) p.68] and that an entrepreneur operating under the principle of substitution

> ...will push every investment up to the margin at which he no longer expects from it a higher net return than he could get by investing in some other material, or machine, or advertisement, or in the hire of some additional labour... Marshall (1920) pp.340-341.

The emphasis on expectations highlights the future-looking nature of the investment decision; the outcome of an individual's "investment may vary widely from his expectation" [Marshall (1920) p.341 also see p.431 p.443]. Fluctuation in output and income are not presented in the Principles as forces that disturb expectations; they are not mentioned. Only secular forces such as "new invention, changes in fashion, etc." are brought forward to alter the field of available investment opportunities and allow profits to deviate from their "normal" level [Marshall (1920) p.341]. Investments, like savings, appear to reside in a full-employment economy, as does the entrepreneurial income dependent on investment. The "rate of interest" on investment in a secularly unchanged context

> ...is a ratio: and the two things which it connects are both sums of money. So long as capital is "free," and the sum of money or general purchasing power over which it gives command is known, the net money income, expected to be derived from it, can be represented at once as bearing a given ratio (four or five or ten per cent.) to that sum. Marshall (1920) p.341.

This rate of interest on investment is perhaps better thought of as the rate of return on investment to distinguish it from the rate of interest determined by the interaction of supply and demand. "The sum of money" is, of course, "known," since it has been saved or borrowed by the investing party; it represents the cost of a new investment project. Presumably, given an unchanged secular state and changes in demand not arising from fluctuations, the ratio is constant over time; a project's cost will tend to equal its cost of production, and we enter the long-run stationary state [Marshall (1920) p.282 pp.289-291 p.305].

After an illustration showing how the above "rate of interest" may be calculated for a particular investment project he remarks:

> They [illustrations] cannot be made into a theory of interest...without reasoning in a circle. Marshall (1920) p.430 my brackets.

But given an already determined rate of interest, its rise deters investment and its fall spurs investment [Marshall (1920) p.431]. The demand for savings consists of the "aggregate of the demands of all individuals in all trades" and the "commodity" savings or "capital" obeys the law of demand like any other commodity: a rise (fall) in its price, the ruling interest rate, lowers (increases) its demand [Marshall (1920) p.432]. No mention is made of the effect of alterations in the interest rate on the expected net returns of investment projects, an effect which operates through a multiplier

process. Nor are the effects of economic fluctuations brought to bear, a more likely consideration for Marshall [Marshall (1920) pp.493-494]. The level of income is presumed constant, if not at full employment.

Marshall contrasts free capital with capital that has already been invested, or "fixed capital" [Marshall (1920) p.63]. Comparing them, Marshall writes that

> ...the income derived from capital already invested in particular things, such as factories or ships, is properly a quasi-rent and can be regarded as interest only on the assumption that the capital value of the investment has remained unaltered. ...[T]he phrase "the general rate of interest" applies in strictness only to the anticipated net earnings from new investments of free capital... Marshall (1920) p.443 my brackets.

From Marshall's point of view "the capital value" will be "unaltered" only in a stationary state where no secular changes occur; in such conditions he surmises that the investment's historical cost will equal its replacement cost. The money value of fixed capital will vary from its original cost "if its prospective income-yielding power" varies [Marshall (1920) p.341 pp.492-493]. Fixed capital's value, therefore, may not be known, but can be "ascertained...by capitalizing the net income which it will yield" in a new secular environment [Marshall (1920) p.341]; its value is "the aggregate discounted value of its estimated future net incomes" [Marshall (1920) p.492].[7] Separating the relevant role of the interest rate in considerations of new and old capital demonstrates his above aggregate demand for capital applie-

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[7] This latter notion is similar to the Treatise's "demand price of capital goods" and the General Theory's "demand price of investment," both of which refer to new investments [Keynes (1930a) pp.180-181 (1936) p.137].

solely to "the investments of new capital" or to the capital flow of "marginal investments" [Marshall (1920) p.492 also see p.195].

Holding the secular conditions constant Marshall tells us "in the long run" the quasi-rent on fixed capital will equal the long-period normal rate of interest.

> The many misconceptions...as to the nature of a quasi-rent, seem to arise from an inadequate attention to the differences between short periods and long in regard to value and cost. ...Quasi-rent is correctly described as an unnecessary profit in regard to short periods, because no "special" or "prime" costs have to be incurred for the production of a machine that, by hypothesis, is already made and waiting for its work.
>
> ...[W]hile in the long run it [quasi-rent] is expected to...yield a normal rate of interest...on free capital... Marshall (1920) p.352 fn.1 my brackets.

Marshall is merely reiterating his position, now applied to the theory of capital, that in a stationary state short-period and long-period values converge.

Finally we are told that it is the real interest rate which investors are considering.

> For the rate of interest which the borrower is willing to pay measures the benefits that he expects to derive from the use of the capital only on the assumption that the money has the same purchasing power when it is borrowed and when it is returned. Marshall (1920) p.493.

Marshall goes on to explain that fluctations in the "real rate of interest" are linked to "inflation and depression," but "[t]hese evils" are to be distinguished from the "slow changes in the purchasing power of money" [Marshall (1920) pp.493-494 my brackets]. We will address Marshall on the trade cycle and trend price movements in a moment. Setting these factors to one side, for the moment, it is clear that we can conclude from the quoted passages that Marshall's investors, like

his savers, are weighing the real benefits of their activities according to the principle of substitution.

The equilibrium interest rate "is determined in the long run" by the interaction of the aggregate supply and the aggregate demand for savings or 'capital,' the term Marshall prefers [Marshall (1920) p.443 marginalia].

> Thus then interest, being the price paid for the use of capital in any market, tends towards an equilibrium level such that the aggregate demand for capital in that market, at that rate of interest, is equal to the aggregate stock forthcoming there at that rate. Marshall (1920) p.443

Reference to the supply of savings as "the aggregate stock forthcoming" is confusing. It interjects an asymmetry in comparison with the flow of investment demand we have identified above and contradicts the flow of savings supply, or "annual rate of savings," that we have already discussed [Marshall (1920) p.196]. In both sections of the Principles from which we are now drawing, he speaks of the "volume of saving" or the "accumulation of wealth" changing with the rate of interest [Marshall (1920) pp.195-196 p.443]. To the contemporary ear, in the above-indented quote Marshall sounds as if he is mixing a stock with a flow, and presenting an ambiguity of interpretation.

Eshag (1963 pp.47-48) raises the same issue in reference to the same quote and decides on a strictly flow interpretation. His interpretation is also a net-flow interpretation which is certainly reasonable under the Principle's preoccupation with growth and accumulation [Marshall (1920) p.492]. In the context of Money, Credit, and Commerce and its clear, if implicit, stationary-state

assumptions which we have uncovered, growth or accumulation in long-period equilibrium would lead us into a steady-state model. To make Marshall consistent in the context of both his books under discussion either we limit the Principle's discussion to a stationary-state context or we extend the stationary-state conditions to accommodate accumulation under steady-state conditions. Either option would preserve the long-period equilibrium of the economic system; this appears to be Marshall's main contention in laying out the stationary-state conditions for the quantity theory in Money, Credit, and Commerce.

Taking the stationary-state route, since we will find that Marshall holds the level of plant and equipment constant in his explanation of long-term price trends [Marshall (1923) p.256], this route would imply that "in the long run" of a stationary state's long-period normal values not only would the flows of savings and of investment be equal, but also the accumulated savings either in the form of bonds or in the form of direct ownership and indirect stock ownership would be equal to the accumulated wealth whether private or public. In the stock of private wealth Marshall includes

> ...land and houses, furniture and machinery, and other material things...but also any share in public companies, debenture bonds, mortgages and other obligations... Marshall (1920) p.47.

In the stock of public-material wealth are such things as the facilities of "civil and military security" and "public property and institutions of all kinds" [Marshall (1920) p.49]. If a full-blown long-period stationary state is the situation envisioned, including the equality of historical and replacement capital costs, it is clearly

not a simple partial equilibrium.

But this should not be surprising since we saw that the "logical consequences" of his long-period analysis were of a general equilibrium nature [Marshall (1920) p.315 ft.1]. Through his implicit assumptions of the stationary-state conditions, Marshall is implicitly pointing to the conclusion that the value of all outstanding stocks, bonds, deeds, mortgages, etc. reflect the historical and replacement cost of all outstanding physical capital. And in a stationary state, Marshall's rate of interest on long loans is a long-period equilibrium long-term interest rate and the discount rate is the long-period equilibrium discount rate, both situated in a context ideal for the quantity equation. Interestingly, he notes that in a stationary state the seasons, and therefore "the harvests themselves...[are] uniform," so that their effects are predictable and do not disturb expected normal values; good and bad harvests are factors, among others, which Marshall identifies as initiating his trade cycle [Marshall (1920) p.305 my brackets, (1923) p.260].

Monetary Price Level Dynamics and the Trade Cycle

Marshall's theory of price-level dynamics is situated in the quantity theory tradition, although as we said above he was dissatisfied that the conditions under which the quantity equation held have not been made specific. We identified Marshall's conditions with those of a stationary state. The quantity equation holds when the relationships between consumption, production, distribution, and communication are all stable including the exchange relationships; the credit instruments and institutions are held fixed; and population,

aggregate income, and wealth are constant [Marshall (1923) p.45 p.48].[8] It is because the same conditions are required of the quantity equation as of a stationary state that we can identify the values which prevail when the quantity equation holds as long-period stationary-state values. From our review of the Principles we also understand that in a stationary state, as well as in short-period or long-period equilibrium, expected values are realized values and so we add yet another condition. It is the changes in expectations that "temporarily" alter the quantity equation's price-level/money-supply relationship and lead to Marshall's trade cycle; but further, changes in expectations are induced by changes in the money supply that set in motion Marshall's long-period price-level adjustments [Marshall (1923) p.45 p.249 p.256].

Marshall presents examples of two disturbing factors: an increase in the narrowly defined money supply and a change in expectations. The latter may occur spontaneously or be induced by the former. Changes in the supply of "precious metals" lead to "long-period fluctuations" of the price level, while "short-period fluctuations" of the price level arise from "uncertainty," changes in "confidence," and the expansion of credit [Marshall (1923) pp.18-19 p.246 p.249]. Although the expectational consequences of a long-period money-supply change are brought forward by Marshall, he analyzes money-supply changes as if their expectational consequences do not affect the level of output and employment. It is in the trade cycle that we find changes in expectations leading to changes in employment and output. His

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[8] Marshall (1871) presents a similar analysis.

presentations are designed to reveal the mechanism or causality behind price-level dynamics, a theme we will find both Wicksell (1898) and Keynes (1930a&b) developing. For clarity's sake we will address the disturbing causes one at a time. We will address a monetary disturbance first.

Inflationary and Deflationary Trends:

Starting from an equilibrium long-period long-term rate with its "corresponding rate of discount," Marshall introduces an "influx of a good deal of bullion"; he is looking at the "special case of the effect of an increase in currency" [Marshall (1923) pp.256-257]. When bullion is entered into the banking system, its initial impact is to lower the rate of discount and increase the "command over capital" in speculators' hands. The influx does not enlarge "the amount of capital,"

> ...in the strictest sense of the word: it does not increase the amount of building materials, machinery, etc. Marshall (1923) p.256.

Capital includes both:

> Consumption capital...in a form to satisfy wants directly...[and] Auxiliary capital...consist[ing] of all the goods that aid labour in production. Marshall (1920) p.63 my brackets.

The amount of capital or goods neither increases initially nor later; output is fixed at its full-employment level. The speculative traders enter the various markets and increase their demand for the various commodities "and so raise prices" [Marshall (1923) p.256]. The process becomes "cumulative":

> The loans to one man make him a good customer for others at good prices, and make them eager to borrow: that makes them good customers; and so the movement grows. Marshall (1923)

p.257.

With a higher price level, and given "the methods of business remaining stationary," the quantity of "cash" or "currency" that individuals and firms hold for transaction and precautionary purposes increases [Marshall (1923) p.256 my underlining]. Marshall states that the price-level increase attained is "sustained"; nominal money demand has risen with the price level. We can suppose -- Marshall does not state this, but seems to imply it -- that the influx backing speculative loans has been transformed into coin and the backing of bank notes and deposits held for transactions and in precaution.

Marshall explicitly adopts another avenue to explain why the price-level rise "tends to increase the rate of discount" [Marshall (1923) p.257]. Marshall explains that the discount rate rises as the real discount rate would fall with inflation; he is implying that lenders and lending institutions attempt to preserve their real purchasing power [Marshall (1923) pp.73-74 p.257]. It is interesting that Marshall does not explain the rise in the discount rate as being caused by the banking system finding its excess reserves run down through the increase in transaction and precautionary demand. Although there is a passing reference to "anxious" bankers worrying about the exportation of precious metals when the specie point is met, the passage which refers to the rise in the discount rate makes the fall in purchasing power the direct causal factor [Marshall (1923) pp.73-74 p.251 p.257, (1926) p.274]. But Marshall's explanation is incomplete; presumably the rise in the discount rate reduces the speculative buying and selling, ending the inflation. As the inflation rate comes down so

would the discount rate required to keep lenders satisfied, stimulating anew the speculative behavior. The use of onetime excess reserves as transaction and precautionary balances would also motivate, but now also would sustain, as Marshall would like, the discount-rate increase needed to inhibit excess speculation.

What has happened to the long-term interest rate through all this? In the earlier sections we discussed the interest rates in the context of an implicitly stable price level; this is an assumption that Marshall holds throughout the Principles [Marshall (1920) pp.51-52]. Marshall now has explicitly introduced a distinction between the nominal and the real rates of interest [Marshall (1923) pp.71-74]. He states that not only will the discount rate rise due to the fall in purchasing power, but so will "the rate of interest on long investments," which is our long-term interest rate, which in stationary conditions is determined "by the rate of interest...[on] the investment of capital" [Marshall (1923) pp.257-258]. By the term 'investments' in this quote Marshall means loans and by the phrase 'long investments' he means securities [Marshall (1923) p.73 p.257 also see pp.91-92, (1926) p.274]. He does not mean investment in real capital -- plant and equipment -- which he tends to refer to as 'investment of capital' or 'investments of capital' [Marshall (1923) p.75 p.257, (1920) pp.292-301 p.341]. The rate of interest on long investments, the long-term rate, is then rising with the discount rate due to inflation as long lenders attempt to preserve their real purchasing power.

Marshall does not supply us with the securities markets' mechanisms behind the long-term rate. Presumably, the initial fall in

the discount rate has led to a reductio. in the long-term rate, as the speculative bullish demand for securities and its own cumulative process, a bull market, lowers the premiums in interest and dividends required to induce speculators to hold securities. The increase in the discount rate turns bulls bearish, requiring an increase in the long-term rate to attract them back into the market. What motivates the increase in the discount rate, though, is ill-specified.

As mentioned earlier Marshall states the process outlined above may be "broken by cyclones of distrust," pushing the discount rate "for a time" to an "exorbitant" height and causing stock market "panic" [Marshall (1923) p.257 p.259]. Before entering into this territory, we might set it aside while keeping in mind its potential presence, and ask where the discount rate and the long-term rate are heading, if the process worked smoothly. Both rates are grounded in a stationary state or in secular changes in a stationary state; the latter at any frozen moment in time is simply the former. In a stationary state an equilibrium long-period interest rate is defined through the interaction of the supply and the demand for savings or capital. Marshall takes us part of the way to this conclusion, but an inconsistency arises. He writes:

> A change in the rate of discount is indeed the ripple of a wave on the surface: the average level of the rate is governed by the rate of interest which can be got for the investment of capital: and this is being lowered by the rapid and steady growth of things, the actual excess of production over consumption. Marshall (1923) p.257.

The reference here to the "average" discount rate derives first from the passage appearing in a context were the question of "cyclones" has been raised. Second, net investment is occurring simultaneously as

seen in "the actual excess of production over consumption"; as noted above, consumption for Marshall is both the consumption of consumer goods and the consumption of capital goods [Marshall (1920) p.54]. A stationary state has not come into being and the interest rate on the net "investment of capital" is not yet the long-period stationary-state equilibrium interest rate. Further, there is perhaps room in the above quote to suggest ongoing changes in the secular conditions continuously spurring net investment.

The inconsistency is this; Marshall has already claimed that the price level attained with added precious metals is sustainable through the operation of increased transaction and precautionary-demand balances and through the maintenence of a constant level of the real interest rate. Further, there is no change in capital "in the strictest sense of the word"; but we learn in the Principles that as the scale of production is increased through net investment, "internal and external economies" of scale will drive the supply price downward [Marshall (1920) pp. 380-381]. Returning to Marshall's fishing-industry example:

> ...[A]n increased supply could be produced at a lower price after a time sufficiently long to enable the normal action of economic causes to work itself out: and, the term Normal being taken to refer to a long period of time, the normal price of fish would decrease with an increase in demand. Marshall (1920) p.308 my brackets.

For the price level to be stable or sustainable, net investment must not be occurring and secular changes which give rise to net investment must not be occurring. The price-level dynamics described by Marshall are occurring relative to a given stationary state where both the discount rate and the long-term rate are determined by the long-period

equilibrium interest rate. All that has been disturbed in this state are the price and profit expectations of security speculators and commodity traders, which are returned to their normal levels by the rise in the discount rate, and no real net investment takes place. The expected-price/realized-price equality occurs at a higher level due to the influx of precious metals.

It is perhaps the always pragmatic and realistic side of Marshall that holds him back from some of the logical consequences of his theorizing. He has in mind an explanation of actual values or averages of actual values through the combined insights of his various periods. In the immediate context Marshall states that:

> ...the rate of interest is governed by the average profitableness of business in general: fluctuations of the market rate of discount about the average rate of interest are governed by a great variety of passing incidents in the general course of business. Marshall (1923) p.258.

Marshall's ultimate quest is organized through his methodological perspective, but because his ultimate quest is an explanation of realized actual values, it is not surprising that he does not draw the stationary-state conclusions and speak of a unique long-period equilibrium interest rate. When we turn to Wicksell and Keynes' Treatise, much of this tension between market values and theoretical values will have retreated. This, of course, is not to say that they are not ultimately concerned with explaining market values. But the long-period interest rate, or a variation on it, re-emerges in the more precisely defined setting of their "natural rate" of interest.

Having stated that the average profitability of business -- or, we might state, the stationary state long-period equilibrium interest rate

-- is the ultimate determining factor of the discount rate and the long-term rate, Marshall does not bring the long-period interest rate into play when there is an influx of precious metals. That is, given an initial long-period equilibrium, entrepreneurs do not compare either their current long-period interest rate, their current rate of return, nor their expected rate of return on new investment projects to the ruling long-term interest rate and attempt to expand or to contract capacity. This becomes a theme in both Wicksell and the Treatise; in the latter it points up where Keynes picks up from Marshall. Only in Marshall's trade cycle or credit cycle do we get an inkling of alterations in output and capacity. It is to the trade cycle we now turn.

The Trade Cycle:

In the Principles we are told that a "reckless" credit expansion is "the chief cause of all economic malaise" [Marshall (1920) p.591].[9] Quoting Lord Samuel Overstone, Marshall tells us that:

> ...the state of trade resolves apparently in an established cycle. First we find it in a state of quiescence-next, improvement-growing confidence-prosperity-excitement-overtrading-convulsion-pressure-stagnation-distress-ending again in quiescence. Marshall (1923) p.246.

If a credit expansion is the "chief cause" of the cyclical pattern, there are initiating causes of an exogenous nature that stimulate the credit expansion. Marshall states:

> An improvement of credit may have its rise in the opening out of foreign markets after a war, in a good harvest, or in some other definite change: but more often it arises from the mere passing away of old causes of distrust, which had their origin in some previous misfortune or mismanagement. Marshall

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[9] Also see Marshall (1920 pp.493-494).

(1923) p.249.

But "an ill-considered increase in the volume of an inconvertible currency" or a "currency inflation" alone may set the cycle in motion [Marshall (1923) p.47 p.75]. Currency inflation is one response to an exogenous change in the demand for money broadly defined, along with the expansion of "book credit" or demand-deposit loans and the expansion of the acceptance of bills of exchange [Marshall (1923) p.249].

At the level of methodological abstraction, both the demand-induced credit expansion and the institutionally initiated currency inflation are exogenous in nature. They lead to "short-period fluctuations" in the price level which "efface themselves" relative to long-period values, much like the short-period consequences of a "cattle plague" [Marshall (1923) p.19]. It is left vague where the economy is at the outset of the cycle; this makes it difficult to understand what relationships hold between the discount rate, the long-term rate, and the stationary long-period equilibrium interest rate. These relationships are not addressed in Marshall's description of the trade cycle. The initial conditions are left vague and we do not know precisely upon what the exogenous events are acting, nor do we know how to connect the process the exogenous events initiate with the quantity equation and its conditions.[10]

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[10] Keynes (1930a p.167) criticizes Wicksell (1898) for not "linking up" the short-term rate with the quantity equation. Presumably this criticism would apply equally to Marshall. The Treatise's direct criticism of Marshall is aimed at Marshall's emphasis on the stimulation given by a fall in the bank rate to speculation at the expense of ignoring investment in plant and equipment [Keynes (1930a) pp.171-173]. While this criticism is true of money-supply changes that

A number of initial possibilities are suggested by Marshall's description of the initiating factors: A "good harvest" may disrupt the long-period normal equilibrium values from their stationary state, or the "passing away of old causes of distrust" may lead to a "revival" from slump conditions [Marshall (1923) p.249 p.75]. In the latter case does each firm, from its point of view, begin from a short-period equilibrium relative to its product market, given the slump demand condition and in keeping with Marshall's short-period statical methodology? Would Marshall concur that at each phase of Lord Overstone's "general outline," a momentary hypothetical entrepreneurial short-period equilibrium could be analyzed [Marshall (1923) p.247]? The answer would appear to be yes, insofar as the methodology of the short-period was designed to analyze just such transitory events. Marshall is now interested in explaining the transition from one phase to the next; it is not surprising that he does not address this question. To Marshall, short-period equilibrium positions are uninteresting. But for us it is a natural question, our having been taught the lesson of the General Theory's sustainable short-period equilibrium, and it is a question that will recur when we address the trade cycles of Wicksell (1898) and of A Treatise on Money. We will investigate the implications of this question for Marshall after laying out his trade cycle.

The process having begun, Marshall emphasizes the rise in prices and wages that is apparently facilitated by the expansion of credit;

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we have just discussed, it is not wholely true in Marshall's trade cycle, as we shall see.

this emphasis is at the expense of downplaying output and employment gains, a possible fallout from slump conditions, and downplaying the actual expansion of capacity through investment, both of which could also be facilitated by the expansion of credit [Marshall (1923) pp.18-19 pp.249-250, (1920) pp.590-592]. The impression is that we are dealing with an economy that acts as if it is at full employment, even though resources are less than fully utilized at some points in the cycle. It is an increase in product price and presumably revenue that spurs further expansion, according to Marshall. Implicitly, at least in a cycle that begins from slump conditions, increases in output and employment accompany the upturn.

The upturn begins, "Whatever its origin," with orders to "builders and manufacturers...for additional machinery and other plant"; prices rise, as do wages, as firms "compete with one another for labour." The higher wages of labor "increase the demand for all kinds of products," presumably consumer goods and the goods required in the production of consumer goods. New companies are brought into being with the rise of "general activity." Confidence is re-enforced and credit expands further; prices, wages, incomes, and profits rise further and speculators enter the markets buying "goods with the expectation of selling them at a profit" [Marshall (1923) p.249]. There is some suggestion that the velocity of circulation increases as inflation undermines the real purchasing power of money, driving the inflation rate higher; that is, demand for nominal balances falls. This is only a suggestion since Marshall in this passage is only speaking of inconvertible currencies [Marshall (1923) pp.47-48]. There is no

reason not to generalize this proposition, though Marshall neither generalizes it nor brings it forward in his discussion of the trade cycle. We will find Keynes in the Treatise making extensive use of alterations in the velocity of circulation in his price-level cycles.

The cycle peaks as existing firms, emerging firms, and speculators borrow, respectively,

> in order to extend their business...in order to start their business...in order to buy and hold goods: trade is in a dangerous condition. Those whose business it is to lend money are among the first to read the signs of the times; and they begin to think of contracting their loans. But they cannot do this without much disturbing trade. Marshall (1923) pp.249-250.

The overt sign that Marshall points to arises in the international sphere; the balance of trade turns against the inflating nation; it leads to a depreciated currency and the meeting of the "specie point" [Marshall (1923) p.251]. The "anxious" bankers are apparently prepared to raise their lending rate, the money-market rate, in order to preserve their precious metal reserves. Marshall does not bring forward his argument that lenders raise the interest rate in an attempt to preserve the value of their lent funds. He has simply posited the emergence of a general bearishness which apparently affects all lending, short or long, as people anticipate "a fall in prices" and the inability of borrowers to repay their loans [Marshall (1923) p.251]. Funds can be raised only on "very high" terms or not "even on any terms," projects go uncompleted, speculators unable to pay creditors sell out at a loss, and the result is that "failure and panic breed failure and panic" until we reach the bottom of activity and prices, described as "a dull heavy calm" [Marshall (1923) p.250].

Presumably a return of confidence is awaited; a return that is

premised, we can infer, on a turn-around in the terms of trade and a reduction in the interest rates. A turn-around in the terms of trade will require a reduction in nominal product prices and, as a component of product prices, a reduction in nominal wages. Marshall points out that both entrepreneurs and labor will be reluctant to make such reductions; entrepreneurs prefer reducing their output "to help improve the market for [their] own goods" or to keep from "spoiling their markets" and workers "are inclined to stop work" on the supposition that a nominal wage cut "will not be easily raised" even if, through a fall in nominal consumer-good prices the nominal wage cut does not imply a real wage cut [Marshall (1920) pp. 311-312 (1923) pp.18-19]. Something of a nominal wage/price floor is implicit in Marshall's remarks; he does not perform this synthesis nor draw out its consequences. We will find Keynes in the Treatise arguing that the nominal wage floor leads to a long process of adjustment as the interest rate must be held at a high level to squeeze nominal wage concessions [Keynes (1930a) pp.242-245].

It is apparent that at the bottom of a slump we have not returned to the long-period normal values of a stationary state, since we have argued above that this implies full employment and the complete adjustment of a firm's organization, labor-skill needs, and plant and equipment to permanently altered conditions of demand. But is it possible to posit a short-period equilibrium in the "dull heavy calm"? As mentioned above, Marshall is interested in the transition from one stage of the cycle to another and does not raise the question of a possible equilibrium. Given our discussion of the entrepreneurial

pricing and output decision, which partially draws from the Principle's description of the short-period[11], we may assume the surviving firms are in a short-period equilibrium with respect to their slump demand conditions at any frozen moment in the time frame of the short-period.

> Those [firms] who have saved themselves are in no mood to venture again: companies, whose success is doubtful, are wound up, and new companies cannot be formed. Marshall (1923) p.251 my brackets.

The surviving firms are covering their marginal prime costs (wages, raw material cost, and cost to wear and tear on plant and equipment) and some of their supplementary costs (management salaries and owners' profits or "charges" to the capital invested) [Marshall (1920) p.299 pp.311-312]. The factor that would disrupt their short-period equilibrium pricing is a possible change in expected prices or a change in confidence, say due to some exogenous event such as a good or bad harvest or an outbreak of war, or due to a change in the endogenous variable: the banker's discount rate.

Presumably a change in the discount rate would alter the behavior of speculators and, through them, the long-term interest rate, which in turn would alter the level of investment. But Marshall tells us in a subsection, where he continues his discussion on "unreasonable expansions of credit," that "even a temporary stringency of the money

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[11] Marshall drew heavily on his earlier writings when composing later works; he did this, at times, in an almost verbatim manner. On the trade cycle the interested reader can compare Marshall and Marshall (1879 pp.152-153) to Marshall (1923 pp.249-250); Eshag (1963) points out many of these overlapping passages in the footnotes to his text. On the short-period pricing and output decision compare Marshall (1920 p.299 pp.311-312) to Marshall (1923 pp.18-19).

market" leading to "small" changes in the discount rate and security prices may set off "a stock exchange avalanche, or panic" [Marshall (1923) pp.258-259]. The "dull heavy calm," we may conjecture, falls over the security market when the panic's bottom is reached and cuts off the institutional route by which the discount rate operates through the economy. A fall in the discount rate may not simply and mechanically induce speculative activity, but must also overcome the expectational barrier set in place by the security-market panic. Given the state of expectations, it is the interest rate, the endogenous variable influenced by international exchange considerations, which may keep Marshall's hypothetical short-period equilibrium from being an equilibrium in real historical time; but with the security market's inclusion under the expectational umbrella, the historical equilibrium is complete. We have, of course, wandered into this Marshallian synthesis from the hindsight of the General Theory, particularly Keynes' discussion of investment and liquidity preference [Keynes (1936) ch.12-13 ch.15]. Liquidity preference is designed to hold in general circumstances, not just in a slump; how Keynes reached the generalization forms part of our quest.

Conclusion

In this chapter we first described Marshall's "statical method" as he presents it in his Principles. We found it contained a notion of a stationary state with its attendant long-period implications. Although this notion was used little in the context of the Principles's industry-level partial-equilibrium analysis, we found the stationary state was raised to a level of great importance when Marshall took up

questions in monetary theory, particularly in his description of the context in which the quantity theory held. With this insight in hand we were able, by cross reading Money, Credit, and Commerce with the Principles, to determine Marshall's implied views on investment and saving. This led us to conclude that he held a view of interest-rate determination that implies a long-period normal-equilibrium interest rate akin to a natural rate of interest determined purely by the real side of economic activity.

With this interpretive perspective in hand, as well as an understanding of Marshall's views on money and financial markets, we turned to his analysis of price-level trends and periods of economic crisis. In his analysis of inflationary and deflationary price-level trends we found that the speculative behavior he describes takes place relative to a stationary state, particularly due to his assumption that real capital does not change and the long-period interest rate is determined by "the average profitability of business in general" in full-employment "stationary" conditions [Marshall (1923) pp.256-258]. Although Marshall mentions that price-level trends may be interrupted by periods of crisis, his argument implies that stationary-state values determine the eventual outcome.

For Marshall, "short-period fluctuations" in the price level are transitory relative to long-period values [Marshall (1923) p.19]. But we raised the issue, unaddressed by him, of a short-period equilibrium in his credit crisis by asking about the expectational consequences of the crisis, particularly since he explicitly states that the banking system and financial markets can be part of the current expectational

state of the economy. Our tendency was to answer positively to the possibility of an underemployment equilibrium in Marshall's system, though it is clear that Marshall did not hold such a view. Instead he relied on the dominance of long-period values to have themselves felt and equilibriate the economy at its full-employment potential. It is unclear, though, through what mechanisms these long-period values or their potentials were made known to Marshall's actors in the economy. We will find in Wicksell (1898) and in Keynes (1930a&b) an attempt to make the mechanisms of long-period adjustment more precise, although their continuation in the quantity-theory tradition, with its emphasis on price-level adjustments, will lead them to overlook the expectational consequences of less than full employment and will lead them to focus their attention on price-level adjustments.

Chapter Two

Interest and Prices: Wicksellian Monetary Theory, Equilibrium, and Cycles

Wicksell, working in the quantity-theory tradition [Wicksell (1898) p.xxiii p.50], proposes to explain the mechanism behind cyclical price-level changes. A stable price level is shown to emerge after either changes in the availability of credit, changes in factors affecting the supply of inputs or changes in productivity. These elements are largely not distinguished and are presented as giving rise to the same cyclical mechanism, though some differences in detail are observed, particularly at the microeconomic level. We will touch on the latter in a moment. "The economic equilibrium of the system is ipso facto disturbed" when a difference arises between the money rate and the natural rate, setting in motion dynamic disequilibrium price-level adjustments [Wicksell (1898) p.105]. The natural rate roughly represents "the profit on capital, which in its turn is determined by the productivity and relative abundance of real capital" [Wicksell (1907) p.214]. We will clarify the components of the natural rate in a moment. It roughly corresponds to what we have identified as Marshall's long-period normal interest rate. In Wicksell its gravitational and stabilizing role is made quite clear. The money rate of interest and the natural rate are considered independent within the limits set by international monetary arrangements, with passing reference to the role of domestic-account reserve ratios [Wicksell (1898) pp.111-114]. The banking system has a degree of freedom in setting the money or market rate, so that the market rate and the

natural rate are not "immediately connected with each other" [Wicksell (1907) p.214] Their separation sets in motion the dynamics of the price level.

From the outset we should clarify what price-level dynamics or cycles Wicksell has set out to explain. The dynamics primarily under discussion are similar to Marshall's trend price-level movements. The short-period price-level movements of crises' booms and busts are only marginally discussed, although we shall find Wicksell's comments important. Using published data for England and Europe, Wicksell tells us that "beginning in the seventeen nineties" until 1809-1810 the available price-level indices rose, and then from 1809-1810 "until the middle of the century" they fell; this is a sixty-year cycle [Wicksell (1898) p.169]. These inflationary and deflationary trends were punctuated by shorter cycles in 1815 and the crisis of 1847 [Wicksell (1898) pp.169-170 p.172]. The second "upward movement of prices started in the fifties," ending in 1873, and since then, at the time of Wicksell's writing, there has been a "gradual fall in price...up to the present time [1898]"; again, these secular trends were punctuated by shorter cycles in 1857 and in the period 1864-1866 [Wicksell (1898) pp.173-174 my brackets]. Wicksell relies on changes in the natural rate and the ensuing disparities between it and the market rate to explain the secular price-level cycles. The periods of crisis or short-period cycles are left largely unexplained, but the passages presented are suggestive of the direction that an explanation might take; as well, they add critical insight toward an understanding of the limitations of a monetary theory built around the natural rate.

The Natural Rate

The natural rate is the consequence of the interaction of "productivity and relative abundance of real capital" [Wicksell (1907) p.214]. Productivity is roughly the state of technical efficiency or development, and it changes with technological advance. From that, we would expect "an ever-changing natural rate" [Wicksell (1898) p.117] and ever-emerging disparities between the natural rate and the market rate; the natural rate alters in a "continuous" manner and the market rate moves in "discontinuous jumps" [Wicksell (1898) p.106]. Holding constant the level of technical efficiency and the abundance of real capital,

> There is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them. This is necessarily the same rate of interest which would be determined by supply and demand if no use were made of money and all lending were effected in the form of real capital goods. It comes to much the same thing to describe it as the current value of the natural rate of interest on capital. Wicksell (1898) p.102.

> Now if money is loaned at this same rate of interest, it serves as nothing more than a cloak to cover a procedure which, from the purely formal point of view, could have been carried on equally well without it. The conditions of economic equilibrium are fulfilled in precisely the same manner. Wicksell (1898) p.104.

The real side of the economy is thought to dominate monetary phenomena in Interest and Prices and clearly the natural rate is equivalent to the real rate. To borrow Schumpeter's terms, "real analysis" dominates "monetary analysis"; the latter

> ...is of secondary importance in the explanation of the economic process of reality. Schumpeter (1954) p.227

We will see that for Wicksell the natural rate, assuming its determinants are constant, is a stable point around which the monetary

interest rate moves in the processes of price-level determination.[1]

An understanding of Wicksell's notion of real capital is necessary to understand his explanation of the determination of the natural rate. Wicksell presents a "systematic" model with a period of production as its basis; the period of production is assumed to be uniform for the sake of exposition, but different intersectorial and intrasectorial periods are discussed as asides. From the perspective of a period of production, capital can be viewed in two manners, as a "lengthwise section" or "at any moment of time a cross section" [Wicksell (1898) pp.125-126]. From the lengthwise view, wages and rent are advanced at the beginning of production to laborers and landlords and are in turn spent on consumption goods that were saved from the previous period of production by capitalists. The division of actors into different groups: laborers, landlords, capitalists, and entrepreneurs--entrepreneurs will be introduced in a moment -- is for clarity of exposition and convenience; in actuality actors take on multiple roles [Wicksell (1898) pp.124-125]. Neither laborers nor landlords organize productive activity or "accumulate capital" [Wicksell (1898) p.124]; they do not save, so their remuneration is devoted solely to consumption goods.

> In this sense consumption goods might be regarded as constituting the original (free) capital by which labour and

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[1] Kohn (1986 pp.76-79) characterizes a real-analysis dominated theory as one that perceives the economy as one of "repetitive flows--a situation in which behavior is unchanging over time." Wicksell (1898) presents itself as a theoretical incidence of a repeating process; after dispensing with relative price changes, he writes that his "cumulative" monetary price-level process "goes on repeating itself over equal intervals of time in precisely the same manner" [Wicksell (1898) p.99].

land are purchased. Wicksell (1898) p.124.

> Beginning with "labor applied to the land," it appears successively as tools, machines, raw material, half-finished product (in which, partly or wholly, the capital is once again free). Wicksell (1898) p.125.

From this vantage, capital is "a flow of liquid goods" that is "available," as Keynes will say in A Treatise on Money [Keynes (1930a) p.114]. In stationary-state conditions with no net investment or net savings, the conditions through which Wicksell's analysis primarily proceeds, the "original" consumption fund in its original size is reproduced and is made available out of the finished product for the start of the next production period. Capital from this perspective is "free capital" "at the beginning and at the end" of the production period [Wicksell (1898) p.126].

From a cross-sectional point of view, "at any moment of time" in the production period there exist "actual capital...(liquid and fixed)" [Wicksell (1898) p.125]. Wicksell further distinguishes between "fixed and mobile capital" and attempts to graduate them by their "durability" [Wicksell (1898) p.126]. Fixed capital, "houses, streets, railways, canals, certain improvements in land, certain kinds of machines," Wicksell asserts are like land, earn a rent, and are not capital in a proper sense [Wicksell (1898) p.126]. In the proper sense or "capital in the narrow sense," is mobile capital "of relatively low durability" which consist of

> ...tools, machines, improvements in land, etc....furthermore raw materials and semi-manufactured products, and finally stocks of finished consumption goods. Wicksell (1898) p.127.

Real capital in cross-sectional time is apparently combined from fixed and mobile capital; a portion of the latter, consumption goods,

determines the fund that constitutes the demand for land and labor in that time period. Further, the fund of consumption goods is the total production of consumption goods minus the interest income in consumption goods of capitalists per period. The latter constitutes capitalists' income.

> ...With the exception of that part which is consumed by the capitalists themselves in the form of interest, the total amount of consumption goods produced yearly, monthly, or weekly can be regarded, on the assumption of a stationary state, as a fund for the payment of wages and rents. This fund represents the (real) demand for labour and land. Wicksell (1898) pp.124-125.

The arbitrary time periods of a week, month or year over which the cross section is viewed are presumably shorter for some periods of production thought to be occurring, and longer for others.

In a stationary state the size of the "original (free) capital" fund and the demand for labor and land it represents would be sufficient to produce the goods to restore the depreciated land-like rent capital, to restore the "low durability" capital, and to restore the fund. The supply of the fund depends on the savings behavior of capitalists, the only group allowed to save in Wicksell's model. There is no net real savings or net real investment [Wicksell (1898) p.126]. Further, through a principle of substitution, the labor and land supplied are fully adjusted and durable goods are valued at their cost of production [Wicksell (1898) pp.131-134].

Under these stationary conditions or in a process leading to them Wicksell demonstrates the determination of the natural rate by drawing another distinction, this one between entrepreneurs who organize production and capitalists who accumulate the fund of consumption

goods.[2] In a barter economy setting, entrepreneurs now borrow the fund "in kind" from capitalists and hire labor and land for the production process [Wicksell (1898) p.103 p.124]. Wicksell is vague about land-like durable capital in the equilibriating process [Wicksell (1898) p.102], but in the stationary equilibrium entrepreneurs pay to themselves

> ...the normal competitive rents for such "rent-earning goods" (sites, buildings, machines) as may be in their own possession. Wicksell (1898) p.138.

When production is completed the entrepreneurial loans from the capitalists are made good out of the entrepreneurs' goods.

> If this procedure were adopted by all entrepreneurs who work with borrowed capital, competition would bring about a certain rate of interest that would have to be paid to the capitalists in the form of some commodity or other. Wicksell (1898) p.103.

This "certain rate of interest" is the natural rate of interest. Presumably this rate is just sufficient to bring forward the fund or induce capitalists to accumulate the fund; Wicksell does not mention the dependency of the saving behavior of capitalists on the natural rate. The actual rate paid has "an upper limit" defined as

> The amount by which the total product (or its equivalent in other commodities) exceeds the sum of the wages, rents, etc., that have to be paid out. Wicksell (1898) p.103.

Over "a long successions of economic periods" entrepreneurial competition will force the natural rate near this upper limit except

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[2] Ohlin (1937b pp.45-46) suggests that Wicksell saw that the decision to invest and the decision to save were distinct decisions made by different people. Wicksell's distinction between entrepreneurs and capitalists captures this insight, but as we will see Wicksell went out of his way to inhibit a change in the level of real savings or real investment in the presentation of his cumulative process. In general his discussion of the cumulative process takes place within a context defined around a stationary state.

for entrepreneurial income necessary to cover the "mental effort of the entrepreneur," monopoly rents, business secrets, and customer loyalty [Wicksell (1898) p.104]. Wicksell tell us:

> Such a process could theoretically, by means of payments in kind, be carried out without the use of money. Wicksell (1898) p.124.

The natural rate is not a monetary phenomena; it is capable of arising under a barter system independent of money. It is or is equivalent to the real rate of interest.

In a manner which Keynes will later adopt in his Treatise, Wicksell calls the entrepreneurial income or profit which would come about "[i]n a completely undisturbed and stationary state,...neither a profit nor a loss," but he suggests that we consider it a "return for the trouble of conducting business" as if like a manager working for someone else the entrepreneur received a salary [Wicksell (1898) p.140]. Wicksell's and Keynes' entrepreneurial earnings have a parallel in Marshall's "normal profits"; these are a component of a long-period supply price brought about by the principle of substitution acting on the "normal supply price" of "capital needed," of "ability and energy required," and of organizational skills required in a business enterprise along with the other elements of production [Marshall (1920) p.503 p.514].[3]

We will see that profits and losses or windfall profits and windfall losses arise with the introduction of money into this real capital barter system, and are due to changes in the natural rate

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[3] The parallel is to the stationary-state condition of no windfall profits or losses, not necessarily to the process by which the stationary equilibrium is achieved. For a further discussion of differences in the equilibrating processes see Robbins (1930) and Kompas (1983, 1985).

relative to the money or market rate in a monetized system. The lack of windfall profits or losses in entrepreneurial income in the barter-like economy that defines the natural rate links entrepreneurial income to an economy-wide long-period equilibrium where durable capital [Wicksell (1898) p.126], as well as other factors [Wicksell (1898) pp.131-134], are fully adjusted; that describes a stationary state. Wicksell says of the analysis we have just presented that

> ...there we were proceeding on the assumption that the condition of the market was stationary. Wicksell (1898) p.106.

A change in one of the factors determining the natural rate would imply a new stationary configuration of the economy. Wicksell's models of the cumulative process are designed to reveal the dynamic disequilibrium movement to a new stationary state given a new natural rate. This process of reconfiguration has consequences for the price level if the banking system does not act to inhibit the price-level consequences.

In a stationary natural-rate configuration, the economy is further implicitly assumed to fully use its available resources.

> The natural rate is not fixed or an alterable in magnitude... In general...it depends on the efficiency of production, on the available amount of fixed and liquid capital, on the supply of labor and land, in short on all the thousand and one things which determine the current economic position of community and with them it constantly fluctuates. Wicksell (1898) p.106.

It is the supply of fixed and liquid capital and the supply of labor and land, as well as the technique of production which are mentioned, not their demands.[4] The "relative abundance" of supplies determines

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[4] In fact it is argued that in Wicksell, changes in relative demand while altering relative factor prices only change the allocation of the fixed supplies of labor, land, and capital. Changes in relative

the margin of production and in turn the natural rate [Wicksell (1907) p.214]. Wicksell discounts any effect of changes in demand for labor and land on the natural rate. He is aware that with a fall in the price level, at times, "[b]usiness is paralysed, and growing unemployment and falling wages results" [Wicksell (1898) p.2 my brackets], yet this does not cause a collapse in the natural rate or a collapse in the extent of production. Over the course of the secular inflationary and deflationary price-level cycle, unemployment is relatively unimportant. He cites a figure of a one percent average unemployment rate [Wicksell (1898) p.143] and argues that in an inflation, actual expansion in output is "impossible" and in a deflation, "on the whole activity will be maintained at its former level" [Wicksell (1898) p.143 p.149].[5]

Wicksell is cognizant that an increase in the price level due to a fall in the money rate, (to anticipate his argument), leads to the expansion of durable-good production at the expense of liquid-good production due to the relative longevity of durable goods and the length of the investment period for them, but he minimizes this effect on plant and equipment and so, also, on the extension of investment into particular lines of production [Wicksell (1898) p.96 pp.143-144]. With the natural rate fixed it will reflect the full-employment

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factor prices do not change the given supplies of each factor; see Robbins (1930) and Kompas (1983, 1985).

[5] Jonung (1989) reviews Wicksell's writings for their discussion of unemployment. He concludes that except for one apparently anomalous article, Wicksell (1908), espousing the cyclical nature of unemployment and Keynesian views on stimulative monetary and fiscal policy, Wicksell maintained a Malthusian view of the causes of unemployment.

utilization of a given level of plant and equipment. He does integrate into his analysis a natural rate that varies both through technological innovations and through changes in the supply of elements relevant to the production process, but these factors are exogenous, not cyclically induced. A similar exogenously fixed or "real" side-determined full-employment natural-rate assumption generally underlies Keynes' Treatise, and, as we will see, it represents at least one barrier to his escape to the General Theory [Keynes (1936) pp.242-243]. We have, of course, been arguing that Marshall's long-period monetary analysis harbors similar implicit assumptions.

The Cumulative Process

The "connecting link" between the money rate and the natural rate is the general price level [Wicksell (1898) p.109]. Disparities between the natural rate and the market rate can arise for several reasons: technological innovations, changes in supply conditions, influx or outflow of gold, and in Wicksell's gold-based elastic credit system, a change in the bank-rate policy. The details of the latter will be discussed later [Wicksell (1898) pp.62-80 p.110]. Market-rate uncompensated change in one of these sets the stage for Wicksell's "cumulative" process of the price level [Wicksell (1898) pp.94-95] and it is the cumulative process which lies behind the quantity theory.

For both Wicksell and Keynes of the Treatise, the quantity theory "is the most competent" explanation of price-level fluctuations [Wicksell (1898) p.41 p.50 p.101], but for both it does not reveal either the causal mechanism of change or the full potential of the banking system. Neither, for example, found Marshall's emphasis on the

status of excess bank reserves in his analysis of price-level trends a complete description of the "causal train" determining the price level [Wicksell (1898) pp.76-77, Keynes (1930a) p.120 p.168 pp.171-173].[6] In fact Keynes' only criticism of Wicksell is his inability to demonstrate the relationship between the dynamic or cumulative process and the quantity equation [Keynes (1930a) p.167].

Wicksell describes the cumulative effect in an economy that maintains gold reserves for international exchange, but where domestic transactions occur almost exclusively by check [Wicksell (1898) pp.70-55 p.87 pp.110-114]. Up to the limit set by international exchange-rate repercussions on gold reserves, "[t]he 'supply of money' is furnished by the demand [for money] itself" [Wicksell (1898) p.110 my brackets]. The influence of an increase or a decrease in the money rate is varied. A lowered market rate "without any other change in the market situation" [Wicksell (1898) p.87] including the natural rate will lead a borrower

> ...to make some payments which otherwise he would have dispensed with or would have postponed. Either he desires to buy some commodity which otherwise he would not have bought at all, or would only have bought later; or he intends to make a payment in cash where otherwise he would have had to buy on credit; or finally he wishes temporarily to keep some or all of his goods off the market, and he asks the Bank for money with which to meet his immediate or pending liabilities without having to sell his goods. Wicksell (1898) p.88.

The first two increase the demand for goods, the last lowers the supply, and the three together "provide a basis for a rise of prices"

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[6] We have in fact argued in our discussion of Marshall that he did not fully integrate the reserve-ratio/interest-rate mechanism into his presentation, but at times proposed a real interest rate/inflation nexus. Patinkin (1952 pp.845-846) agrees on the first point, but overlooks the latter nexus in Marshall's work.

[Wicksell (1898) p.88]. A fourth important factor is brought about by the fall in the market rate after it has persisted and has lowered the bond rate [Wicksell (1898) pp.74-75 p.89 p.92]. For entrepreneurs who operate with borrowed capital, a fall in the market rate and the bond rate represent a drop in the cost of production [Wicksell (1898) p.89]. With given output price expectations, based on the last period's realized prices, entrepreneurs who are borrowing will attempt to expand production, which raises total earnings and, under full employment, the earnings rates on labor and land. Borrowing entrepreneurs can afford higher wages and rents since their interest costs are lowered.

Nominal aggregate demand then increases and all entrepreneurs--not just borrowing entrepreneurs -- realize excess profits though all-around price increases. The borrowing entrepreneurs' increased demand for labor and land transmits an increase in nominal demand throughout the system through the increased spending of laborers and landlords. Wicksell (1898 pp.95-96) gives an example where initially the increased borrowing is used for "durable investment," particularly housing. This leads to

> ...a rise in wages, ground rents, etc., and this will bring about a rise in the money demand for all kinds of goods... Wicksell (1898) p.96.

Realized or ex post prices relative to expected or ex ante prices and costs are greater than anticipated at the outset of production.

> An improvement in the terms of credit enabled our businessman to pay a higher cash price for the goods [inputs] which he was going to sell [as output]..., even though he was due to receive no more than the normal sale price. At the end of the period he will make the pleasant discovery that he can actually sell his goods at more than the normal price. Wicksell (1898) p.95 my brackets.

Here, the "pleasant discovery" is the effect of every enterprise attempting to expand production. Initially it is due to borrowing firms taking advantage of the lowered market and bond rate, but eventually all firms are willing to pay higher prices for labor and land, since they expect to afford them given their adjusted ex ante price expectations [Wicksell (1898) p.90]. The expected profits based on ex ante price expectations are more than fulfilled ex post as all firms attempt to expand. Entrepreneurial expectations will be raised and this leads to further attempts to expand, even if labor and land costs adjust to expected prices, as long as the money rate and bond rate fall short of the natural rate and borrowing firms force up the level of remuneration.

The disparity of interest rates generates a cumulative effect on the price level via abnormal profits [Wicksell (1898) pp.94-96 p.100]. If the market rate and bond rate return "to normal," entrepreneurs will continue to receive higher prices for output and will continue to afford higher-cost labor and land, but the cumulative effect will be broken [Wicksell (1898) p.95]. The "normal" level of the market rate is simply the natural rate derived from the real capital barter economy discussed earlier. It is a market rate equal to the natural rate which stabilizes prices [Wicksell (1898) p.100]. Utilizing Wicksell's barter framework in a slightly different manner, we can think of the level of liquid capital demanded by entrepreneurs for rents and wages as the level of investment in the production period, and the fund of consumption goods supplied by capitalists for wages and rents as the savings out of last period's production. The natural rate, then, is

the rate of interest that equalizes investment and savings. A similar relationship and description of the natural rate are, as we shall see, set out as the fundamental equations of Keynes' Treatise.

A market rate equal to the natural rate maintains the level of real investment equal to the level of real savings. If the market rate changes and falls out of balance with the natural rate, and everything else is held constant, nominal differences appear in the levels of real investment and real savings, in a monetized elastic-credit economy. At full employment, though, the real values remain equal; real expansion or contraction is not permitted to occur. A fall in the market rate relative to the fixed natural rate raises nominal investment above nominal savings. To achieve equilibrium after the market rate's upward adjustment to its equilibrium, at a higher stable price level and a higher stable nominal level of investment, the nominal level of savings must rise. We will see that, in effect, the real value of savings is to be preserved. Nominal savings will be built up to match nominal investment where something like the real balance effect is operating on the savings behavior of capitalists.

Wicksell has at hand the formal analytical apparatus of the real balance effect. He does not explicitly utilize it in this context, in the sense of presenting the real balance effect rationale. Although earlier he presents it either in the context of "fortuitous" price changes with a constant stock of money or a money stock change with initially stable prices. In both cases the nominal balances are kept to bridge the gap between expenditures and receipts, not as savings.

> Now let us suppose that for some reason or other commodity prices rise while the stock of money remains unchanged or that

> the stock of money is diminished while prices remain temporarily unchanged. The cash balances will gradually appear to be too small in relation to the new level of prices...I therefore seek to enlarge my balance....
>
> The reverse process will take place as the result of a fortuitous fall in prices, the stock of money remaining unchanged, or of a permanent increase in the available quantity of money. Wicksell (1898) pp.39-40.

With a constant money stock, prices will be driven to their original level and with a money-stock change, prices will rise or fall proportionally to the changes in the money stock [Wicksell (1898) pp.40-41]. In an elastic credit system we can expect the latter will show reverse causality, money balances moving with price-level changes, as induced by alterations in the market rate. Wicksell has not introduced the elastic credit system at the stage in his text where the real balance effect is discussed, and these points go unnoticed. After its introduction, he writes:

> Abundance or scarcity of money, and in particular the quantity of cash held by the banks, is now imbued with a merely secondary importance. Such factors are to be regarded as consequences of changes in the demand for instruments of exchange brought about by changes in the level of prices. Wicksell (1898) p.167 my underlining.

The above change in the price level is induced by a differential between the market rate and the natural rate. Of course the initiating market-rate changes may be induced by changes in the money stock, but in Wicksell they may also be managed market-rate changes.

Something of the same real balance analysis is implied in Wicksell's treatment of savings behavior; we will find nominal savings balances rise and fall with price-level changes, closing the gap between nominal investment and nominal savings [Wicksell (1898) pp.138-148]. Whether Wicksell intended the real balance effect to apply to

savings balances, as he clearly does intend of transaction balances, is not clear in the text. The level of real savings balances is held constant none the less.

"Systematic" Ex Ante/Ex Post Investment and Savings

Wicksell in Chapter Nine of Interest and Prices presents a "Systematic Exposition of the Theory" and it is worth our time to development his "quantitative relations" [Wicksell (1898) p.121] in some detail since it is here that he again makes clear his stationarity condition and it is here that he develops the savings/investment nexus most clearly. The previous argument asserted that the price-level increase that accompanies a fall in the market rate relative to the natural rate is sustainable after the market rate returns to its normal level equal to the natural rate [Wicksell (1898) p.95]. In his systematic presentation Wicksell demonstrates the case where the natural rate rises relative to the market rate and then eventually the market rate rises to match the new natural-rate level. Again in the latter, as in the former, it is asserted that a new higher price develops and it is sustainable. These two cases are of interest, since they parallel the Treatise's theory of a monetary cycle or trend price-level movements. They are also important in pointing out the ex ante/ex post distinction between savings and investment; that distinction has been found useful in the interpretation of the General Theory's multiplier process and the equilibrium it implies. Finally, Wicksell's systematic treatment simply allows us to see more precisely what behavioral assumptions drive his cumulative process. If we can clarify these assumptions we open the way to their criticism and to

suggestions for an alternative view of the dynamic process.

Wicksell imagines a one-year period of production at the beginning of which all entrepreneurs borrow funds through the banking system to finance their fund for the payment of wages, rents on land and "rent-earning goods," and their normal entrepreneurial income; the latter is the earnings on entrepreneurial "mental effort" [Wicksell (1898) p.138 p.104]. The fund is spent on the real capital savings of capitalists. Capitalists are distinct from entrepreneurs, even though capitalists momentarily act as dealers in "wage" goods; the profits from the capitalistic dealing "is quite small...[and] we can neglect it altogether" [Wicksell (1898) p.137]. Capitalists in turn deposit their sales proceeds in the banking system. Initially in stationary conditions we are asked to imagine the market rate equal to the natural rate, so the increment to output from production covers the interest charges on borrowing. The capitalists consume this interest income distributed to them through the banking system. Capitalists sustain themselves during the production period by consuming last period's interest income, while entrepreneurs, laborers, and landlords sustain themselves by consuming the borrowed real capital savings fund.

Quantitatively, "[i]n a completely undisturbed and stationary state" a process that has persisted for some periods has K capitalist savings available, measured in nominal terms [Wicksell (1898) p.140]. Entrepreneurs borrow K from the banking system at the market rate of i equal to the natural rate, and distribute the K as wages, rents, and entrepreneurial income. The nominal income of laborers, landlords, and entrepreneurs, K, is spent on the savings fund of capitalists, K. K is

the dollar value of capitalists' real savings after and before exchange at the outset of production. The K-valued investment by entrepreneurs in themselves, labor, and land goes into production for one year and out of which comes K(1 + i) goods in nominal value. We can note for future relevance that at the outset of production, investment equals savings; or, stated alternatively, ex ante investment, investment at the outset of the period, equals ex ante savings, savings at the outset but realized last period, or simply K=K. The price level remains unchanged since at the outset of production, capitalists deposit their K sales proceeds in the banking system which grew to K(1 + i) and the sales proceeds plus interest, one year later, are spent on the output of the entrepreneurs. The entrepreneurial sales proceeds cover what entrepreneurs owe the banking system due to their initial loan of K at the market rate of i: K(1 + i). Capitalists, who now hold K(1 + i) nominal output, save K and consume their interest income, iK. K capital savings, the value of the unchanged level of real consumption goods after capitalists' consumption, is available for the next period's production. Capitalists are the only ones who save in this model[7] and they consume their full interest income; they have a propensity to consume interest income of unity [Wicksell (1898) pp.138-41]. We note that at the end of production and after the second exchange between capitalists and entrepreneurs, ex ante investment, or

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[7] Wicksell (1898 p.149) speaks in one passage of entrepreneurs who are suffering losses covering these losses from "income derived from their own fortunes." The existence of entrepreneurial fortunes imply that they saved in the past. In the "systematic" context in which this appears it is a rather ad hoc change of assumption. Uhr (1960 p.243) points this out, as well as other problems with the systematic model.

the investment at the outset of the production cycle, equals ex post savings, or the savings realized after the final exchange, and equals ex ante savings. When the sequence is stationary and undisturbed, the market rate continues to equal the natural rate and the process repeats itself.

Wicksell next proposed that the natural rate, r_n, rises relative to the market or "contractual rate", r_m, so that $r_n = i + .01$ and $r_m = i$. The natural rate has risen due to

> ...a fall in the level of wages (brought about by a relative increase in the number of workers), or to a fall in the rent of land or other rents, or finally to a raise in the productivity of labor and natural forces as a result of technical progress. Wicksell (1898) p.141.

If we assume that, like wages and the availability of workers, "the rent of land or other rents" also decline due to their "relative increase," then the change in the natural rate can be taken as a permanent change in cost per unit of output. It is not clear what lowers the rents, but presumably the factors affecting this change, as in the others listed, are exogenous in nature. All three causes listed by Wicksell are equivalent to a fall in unit cost, and the inflationary pattern should resemble an equal reduction in unit cost due to an equivalent fall in the market rate with the natural rate held constant, due to, say, an easing of credit availability.

The new natural rate under the initial conditions described by the "undisturbed" economy leads to only one initial alteration in the process; $K(1 + i + .01)$ emerges from the production process [Wicksell (1898) p.142]. Presumably entrepreneurs are not aware initially of the changed natural rate and Wicksell maintains their initial borrowing at

the old K level. K capital borrowing now hires a higher level of labor or land, or the same but more productive level of factors. So .01K profit above income or "surplus profit" accrues to the entrepreneurs which Wicksell assumes is either consumed by entrepreneurs "among themselves" or the product which it represents is put on the market and leads to a "very small...once and for all" price decrease insufficient to turn the surplus profit to a loss [Wicksell (1898) p.142]. This profit Wicksell argues will motivate expansion. Uhr (1960) argues that in fact if the .01K increment to output was put on the market,

> ...then all surplus profit is wiped out and no effort at expansion will be made. Uhr (1960) p.242.

Uhr's argument is, in effect, that capitalists, the only holders of funds, have only K(1 + i) on hand to spend; if they spend it on the output K(1 + i +.01), the output price is driven down one percent, destroying the surplus profit and inhibiting attempted expansion. Wicksell continues his somewhat contrived argument by assuming the full entrepreneurial consumption of surplus profit and no initial price drop.

The assumption of a unitary entrepreneurial propensity to consume profit above normal income and the entailed lack of price-level change preserves the ex ante/ex post savings and investment equality. Entrepreneurs consume .01K above their normal income, capitalists consume iK, and capitalists save K equal to the initial level of entrepreneurial borrowing, K, from which K(1 + i + .01) was produced. Attempted expansion will proceed from the continued existence of differential interest rates, only now the profit is fully consumed. Wicksell's entrepreneurial consumption assumption greatly simplifies

matters since with it the rate of profit is equal to the difference between the natural rate and the market rate, or i + .01 - i = .01, and he finds that .01K equals the level of profits.

With $r_m<r_n$, and with the emergence of profits to the extent of the difference between r_m and r_n, the stage is set for Wicksell's cumulative process.

> If entrepreneurs continue, year after year perhaps, to realize some surplus profit of this kind, the result can only be to set up a tendency for an expansion of their activities. I emphasize once again that so far it is purely a question of a tendency. An actual expansion of production is quite impossible, for it would necessitate an increase in the supply of real factors of production, labour and land, or an expansion in the amount of fixed and liquid real capital, so that the available original factors of production could be employed in longer, and therefore more productive, process. Such changes require time to be effected, and we need not consider them at this point. We suppose that everything remains as before... Wicksell (1898) p.143.[8]

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[8] Although there is no change in the overall level of output, except possibly due to "longer working hours" [Wicksell (1898) p.143], there will be a change in the composition of output since,

> ...[d]ifferent in nature is the benefit conferred by a fall in the rate of interest on those enterprises which employ "more capital", i.e. in which the period of investment is longer than elsewhere. An expansion takes place in their activities, but on the other hand those enterprises which employ less capital are forced to contract as a consequence of the resulting rise in wages, in prices of raw materials, etc. Wicksell (1898) pp.143-144.

A change in either the natural rate or the market rate, holding the other constant, affects a change in the relative conditions of commodity supply and hence in relative prices. Wicksell has asserted these developments have no effect on the "average level of money prices" [Wicksell (1898) p.96]. On the other hand a difference arises when, given a fixed natural rate, the market rate varies from equality with it and then returns to equality with it. In this case the cumulative process will leave relative prices and, we may infer, the structure of production in their original positions; "equilibrium in respect to relative prices is once again restored" [Wicksell (1898) p.94]. But that will occur only when macroeconomic price-level equilibrium is restored with the market rate equal to the natural rate. Patinkin (1952 p.843) agrees that with a fixed natural rate and a monetary disturbance, the equilibrium when restored will be with

Attempted further, expanded overall activity creates increased demand for land and labor, and given their fixed supplies the increased demand raises wages and rents. The "upper limit" of the wage and rent increase is the established surplus profit [Wicksell (1898) p.144]. What, in fact, establishes this rule Wicksell does not say; firms can certainly afford to pay their profits away in wages and rents, but what would force them to do so? If entrepreneurs expected future price rises at the end of production that are more than sufficient to cover their rising costs at the beginning of production, then we could legitimate their enlarged cost commitments, but Wicksell is explicit that they "are not reckoning...on any rise in future prices" [Wicksell (1898) p.144]. The forces of competition must be at work, but they are hidden by the sequential nature of Wicksell's systematic presentation. Entrepreneurs formulate their production plans and borrow on the basis of ex post realized prices, including, we need to add, wages and rents. The aggregate level of this borrowing is higher given the aggregate above-normal realized profits and fixed-price expectations. Next in the systematic presentation the entrepreneurs enter the factor markets with their above-normal borrowing and drive up wages and rents.[9]

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respect to relative prices also. Snippe (1987 p.197) characterizes Wicksell's model in the same way. Since there is implied change in the capital structure of production under the cumulative process, the process is more than simply a nominal income or output "cycle." It parallels in an "Austrian" manner Marshall's stationary long-period, and is more than a "[v]ariable capital" model with a "stock of fixed capital inherited from the past" as Laidler (1972 p.109 my brackets) suggests.

[9] Uhr (1960) explains the competitive forces in this manner; entrepreneurs attempt

> ...to try to expand their activities in the hope of obtaining

Wicksell presents the following developments. Entrepreneurs now borrow K(1.01) money capital from the banking system to finance their production. This sum is used for wages, rents, and normal entrepreneurial income at full employment with no increase in either land or man-hours hired. The borrowed sum of K(1.01) will cost the entrepreneurs K(1.01)(1 + i) at the end of the year-long production period at the market rate of i. At the beginning of the production period K(1.01) is spent on the capitalist-dealers savings of K leading to a price increase of one percent or .01.

> If the workers and landlords raise their demands for goods for the consumption of the current year to the extent that money wages and money rents have gone up, the increased demand is met by the same amount of commodity capital as before. It necessarily results in a rise in all prices -- a rise which it is simplest to regard as proportional to the increase in demand. It follows that the amount paid for the whole commodity capital, of which the value was previously K, is now 1.01K. Wicksell (1898) p.144.

At the beginning of the production period, or ex ante, investment exceeds savings, leading to a rise in the price level equal to the difference between the natural rate and the market rate.

Capitalists deposit their sales proceeds, K(1.01), into the banking system which will be worth K(1.01)(1 + i) at the end of the year. In the production process K(1.01) is transformed to K(1.01)(1 + i + .01) of which K(1.01)(1 + i) is sold to capitalists-dealers, equal to their

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> the same rate of profit on an increased volume of business. But with all resources in full use, no entrepreneur can expand except at the expense of some other entrepreneur. Thus their efforts to pirate labor and natural resources away from one another only leads to a bidding up of wages and rents to $1.01K. Uhr (1960) p.237.

That is, profits are devoted to wages and rents through competition in the factor markets. Wicksell appears to mean something like this, but it is hidden in the sequencing of his model.

deposits plus interest and equal to what the entrepreneurs owe the banking system. Entrepreneurs consume their profits .01K(1.01), capitalists consume their interest income iK(1.01), and capitalists save K(1.01), preserving the real value of their savings with no net savings. Ex ante investment equals ex post savings or K(1.01) = K(1.01). This process will continue period after period, with borrowing or investment exceeding savings by a percentage point ex ante, the price level raising a percentage point, and at the end of the period after production and final exchange ex post savings will equal ex ante investment. The higher price level preserves the value of excess profits, .01K(1.01) in this round, and preserves the motives for continued attempted expansion. With a rise in commodity prices throughout, Wicksell has been assuming that the real income level of all actors excluding profits is constant [Wicksell (1898) p.148].

Wicksell remarks earlier that:

> ...it is clear that in an elastic monetary system...a fairly constant difference between the two rates of interest could be maintained for a long time, and the effect on prices might be considerable. Wicksell (1898) p.110.

When the national banking system, due to balance of trade pressures[10], does increase its lending rate to equal the new natural rate, $r_m = r_n = i + .01$, the tendency to expand is eliminated, but the price level increases that have occurred are sustained [Wicksell (1898) p.147]. The increased cost on borrowed funds, .01K(1.01) at this stage, just offsets the expected profits which would have been available to pay higher wages and rents and still return entrepreneurs their normal

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[10] We will develop the international aspects of Wicksell (1898) in a moment; see Wicksell (1898 pp.111-112) and Wicksell (1907 p.217).

income. The increased interest cost brings the cumulative process to an end.

K(1.01) is borrowed and invested by entrepreneurs, and then spent by entrepreneurs, wage-earners, and landlords on the K(1.01) commodity savings of capitalists. Ex ante investment equals savings and the price level is constant. Capitalists deposit K(1.01) sales proceeds into the banking system which will be worth K(1.01)(1 + i + .01) in one year. K(1.01)(1 + i + .01) emerges from the year-long production process. The output is sold to capitalists, with the capitalists using their deposits plus interest in the transactions with entrepreneurs. With their sales proceeds, K(1.01)(1 + i + .01), entrepreneurs repay the banking system without a surplus profit to retain, consume, and to motivate further attempted expansion. The capitalists save K(1.01) and consume K(1.01)(i + .01) under the assumption of a propensity to consume interest income of one. Ex ante and ex post savings equals investment and the sequence is posed to repeat itself at a stable price level. It is interesting to notice that with the increased market rate the ultimate benefactors of the increased natural rate are the capitalists. They as a group have captured as increased real consumption the increment to output added by the increment to the natural rate. Their consumption has grown from iK(1.01) to K(1.01)(i + .01) without a percentage point increase in the price level.[11]

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[11] It is capitalists', and at earlier stages entrepreneurs', consumption of the goods that are produced by productivity growth or natural rate change that allows Wicksell to argue that

> ...increased productivity cannot by itself be responsible for any general fall in prices. Wicksell (1898) p.172.

Clearly these are special conditions. Also see footnote eight and Patinkin (1952 p.841).

In a similar fashion we can analyze Wicksell's verbal example where he hypothesizes that the market rate falls relative to the natural rate due to "the provision of the Bank of easier credit" [Wicksell (1898) p.87]. Keeping with his systematic exposition, we can modify his example and have all firms borrowing funds. Suppose capitalists save initially K consumption goods in nominal terms and the initial market rate equals the natural rate, say $r_m = r_n = i + .01$. In an undisturbed stationary state, entrepreneurs borrow K funds from the banking system at $r_m = i + .01$, hiring land and labor; and land and labor in turn along with normal entrepreneurial income, including presumably income on rent-earning goods, buy the capitalists' savings of K. Capitalists deposit K in the banking system which at the end of the period will be worth $K(1 + i + .01)$. Through production, entrepreneurs find themselves with $K(1 + i + .01)$ which matches capitalists' deposits plus interest. Capitalists consume $K(i + .01)$ and save K. Ex ante and ex post savings equals investment.

Suppose the market rate falls to i, lowering entrepreneurs' cost of production. At realized past prices entrepreneurs will attempt to expand production by hiring more labor and land; wages and rents rise by .01K and entrepreneurs anticipate their normal income for mental effort. K(1.01) is borrowed from the banking system and spent via wages, rents, and normal entrepreneurial income on the K past savings of capitalists, raising the price level by one percent; the capitalists' sales proceeds are K(1.01). Ex ante investment exceeds ex ante savings. Capitalists deposit K(1.01) into the banking system at $r_m = i$. Entrepreneurs will owe the banks $K(1.01)(1 + i)$, and

capitalists' deposits plus interest will equal $K(1.01)(1 + i)$. $K(1.01)(1 + i + .01)$ emerges from the production process given $r_n = i + .01$. Entrepreneurs sell $K(1.01)(1 + i)$ to the capitalists to repay their loans; the capitalists spending their deposits plus interest. The capitalists consume $iK(1.01)$ and save $K(1.01)$, preserving the real value of both their consumption and savings. The entrepreneurs enjoy the consumption of $.01K(1.01)$ in surplus profits. Ex ante investment equals ex post savings, although ex ante investment exceeded savings. The price level will continue to rise period after period until the banking system raises the market rate to match the natural rate. At such time investment equals savings ex ante and ex post.

In both the above cases when the market rate was increased to the level of the natural rate, ex ante and ex post investment equaled ex ante and ex post savings. When the market rate was less than the natural rate, ex ante investment differed from ex ante savings by the ex post realized level of profits and the price level increased by the rate of surplus profit, .01, or the difference r_n minus r_m. Wicksell suggests, but does not show systematically, that the reverse case, where the market rate is above the natural rate and ex ante investment is less than ex ante savings, leads to losses, lowered wages and rents, and a drop in the price level [Wicksell (1898) pp.149-150].[12]

For our purposes one interesting aspect of Wicksell's analysis is the ex ante differences between investment and savings and the

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[12] Brems (1986 pp.205-215) demonstrates the symmetry of Wicksell's arguments for either $r_m > < r_n$ in a circulating capital single good model. Uhr (1960 pp.243-244) critically addresses Wicksell's own discussion and shows his deflationary process to be the outcome of either inconsistent or ad hoc assumptions.

entrepreneurial behavior thought to be motivated by the profits or losses in their differences. The ex post realization of surplus profits motivates further attempted expansion and perpetuates the ex ante difference between investment and savings, and therefore the ex post surplus profits. We will find that it is precisely profits and losses, found to be the difference between investment and savings, which underline the price level changes demonstrated through the Treatise's fundamental equations. The price-level changes in the Treatise are motivated by a difference between the market rate and the natural rate, although the mechanism is different; and in the Treatise the price level stabilizes at a market rate equal to the natural rate. The ex post equality between savings and ex ante investment follows from Wicksell's production and exchange processes and from his unique set of behavioral assumptions: a propensity to consume interest income and surplus profits of one. Ex post savings are just sufficient to cover ex ante investment; investment generates its own savings. The Treatise too relies on the difference between investment and savings to generate profits or losses. In the Treatise's theory of secular monetary price-level cycles and in its theory of a trade cycle or of crisis, Keynes' presentation of the investment/savings relationship is complicated by the introduction of accumulated savings and portfolio adjustments; and he leaves vague the role of the rate of savings. He speaks as if the nominal savings flow is pegged at its full-employment level, but neglects to specify nominal savings' dependence on nominal income; we will attempt to clarify this in the next two chapters. Wicksell's analysis makes quite clear that nominal savings are

dependent on nominal investment and nominal output. Wicksell's causality running from investment to savings is uncoupled and unclear in the Treatise and leads, as we shall see, to some interpretive difficulties, but the ex post equality between nominal investment and savings does emerge as a price-level stability condition.

In the General Theory the full multiplier theory[13] of the investment/savings relationship reasserts (unknowingly?) Wicksell's causality from investment to savings. Under the full multiplier, ex ante differences between investment and savings are resolved ex post. In the General Theory, of course, we have a different set of behavioral assumptions, particularly a marginal propensity to consume of less than one. It is interesting to note that one aspect of the Cambridge Circus' criticism of the Treatise focused precisely on the investment/savings relationship and the possibility of less than full-employment equilibrium once the full-employment savings assumption was dropped.[14] The Cambridge Circus was (unknowingly?) picking up a theme from Wicksell left undeveloped or unresolved in Keynes's Treatise, but with an important difference. The Circus considered the investment/savings causal relationship in conditions where the supply of output was not perfectly inelastic.[15]

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[13] By the 'full multiplier theory' we mean the multiplier and its effects on income, consumption, and savings after it, in conjunction with the level of investment, has generated its complete impact on those variables.

[14] For example see Robinson (1933 pp.24-25).

[15] On the supply elasticity in the Circus' discussion see Kahn (1931). For a general discussion of the Circus, both theories and personalities, see Moggridge's notes in CWJMK Vol.13 pp.337-343.

This raises the second interesting point in Wicksell's analysis of price-level trends. Monetary changes or displacements relative to the real economy and the natural rate are not thought to alter the overall level of output and one of its components: the level of real savings. Wicksell does mention, as we have noted, change both in the relative structure of production and in the supplies of different goods when the market rate changes due to varying durability of investment and varying lengths of the investment periods [Wicksell (1898) pp.143-144]. These structural developments will show a cyclical disequilibrium pattern in a situation with a fixed natural rate and a varying market rate.[16] The disequilibrium is relative to the undisturbed stationary conditions of the natural rate. The cyclical or disequilibrium relative structure develops as the market rate deviates from the natural rate and then returns toward the natural rate.[17] In this vein we would expect a changed natural rate to lead to a permanently changed structure of production, output, and relative prices. Wicksell asserts that developments in the relative structure of production do not effect the aggregate price level; that assertion is apparently based on his full-employment fixed-output assumption [Wicksell (1898) p.96].

Neither does a change in the money rate of interest change the real level of savings desired by his saving capitalists. The only context in which Wicksell permits capitalists' real savings to vary is in a non-stationary economy where the natural rate is continuously falling

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[16] See footnote eight.

[17] This disequilibrium cycle is reminiscent of the logic of the cycle found in Hayek (1932); Kaldor (1942 pp.366-367) raises the same point.

as "capital is continuously accumulating" and output is growing. Here the increased savings is not addressed in relation to the growing output, but is introduced in an apparently ad hoc manner to motivate a fall in the price level [Wicksell (1898) pp.150-152]. In the stationary context we reasoned earlier that under the behavioral assumptions of the "systematic exposition," the eventual effect of a one-time increase in the natural rate is an increase in capitalists' real income in the form of increased real consumption, and in the intermediate stages an increase in entrepreneurs' real consumption in the form of windfall profits. The increase in real income, including windfall profits in income, does not change the level of real savings for either group or anywhere in the economy.

In Wicksell's systematic cumulative process, the ex ante capitalists' savings or liquid capital goods carried over from the last period present a fixed inelastic supply constraint. The fixed supply leads to the price-level alterations in light of entrepreneurs' decisions to invest relative to this savings supply. Given the ex ante inelastic supply constraint built into Wicksell's period of production model and given that this supply is not withheld from the market, the supply cannot vary with demand. In Wicksell's model only with the hiring of a less-than-full-employment labor supply would we see a drop in output and employment; a lower-than-full employment hiring can only result through wage inflexibility. Wicksell does not pose the question of simultaneous unemployment, excess capacity, and price-level stability. When the natural rate is less than the market rate, fixed wages and rents generate unemployment and excess capacity, but with a

falling price level.

Wicksell relies on wage and rent flexibility to maintain the real output level in a deflation [Wicksell (1898) p.149]. He states that

> ...when the lending rate of interest remains permanently above the natural...they [entrepreneurs] will desire to confine their activities to the more profitable channels, and there will be a corresponding contraction in their demand for labour and land. But workers and landlords will respond by scaling down their claims for wages and rents, and on the whole activity will be maintained at its former level. Wicksell (1898) p.149 my brackets.[18]

We might conjecture that the cumulative effect of losses in conjunction with wage and rent inflexibility would lead to a continuous reduction in output and employment as the price level falls toward zero. When the market rate is adjusted to the natural rate -- stabilizing the price level, unemployment, and excess capacity -- a sustained suboptimal economy would be attributable only to the excess wages and rents. Output expansion would require a price-level increase to restore "profitable channels."[19] These conjectures on "classical

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[18] Wicksell adds in a somewhat non sequitur fashion:
> It is not, however, to be denied that there may be a more or less permanent, though not progressive, loss of employment by some of the workers -- the industrial reserve. Wicksell (1898) p.149 my underlining.

A partial, but incomplete, explanation for this statement may lie in Wicksell's condition that the market rate "remains permanently above the natural rate," which implies that the length of the investment period has shortened, increasing the turnover of capital at the same time that demand for capital is falling due to the entrepreneurial losses. But why further wage and rent cuts to not ameliorate the situation Wicksell does not say.

[19] Laidler (1972 p.114), using Wicksell's systematic technique, develops a situation where with rigid wages there exists price-level stability at less than full employment in a repeating stable process. Given Uhr's criticism of the behavioral assumptions underlying Wicksell's systematic presentation, Laidler's results should be viewed with caution [Uhr (1960) pp.242-243].

unemployment" are in the spirit of Wicksell's model, but they are largely irrelevant to Wicksell since his main purpose in writing Interest and Prices is to explain secular price-level trends, not crises or periods in which unemployment becomes a factor. He holds the average rate of unemployment at "about 1 per cent," presumably an average over his secular periods [Wicksell (1898) p.143]. He holds the crises at bay during secular trends induced by monetary events by relying on the stability of the natural rate and price flexibility.

We will find Keynes in the Treatise takes an approach to explain the trade cycle which embodies both a period of production and an inelastic supply of output during the production period; his approach also leads to price-level adjustments. Neither of their approaches satisfies the Circus' near-constant output price assumption, and in fact they are designed around the quantity equation and its conventional implication that changes in the money supply or ease of availability of credit explain price-level changes. The latter point we have already suggested as a theoretical characterization of Marshall's monetary theory. The Treatise will also rely on price-level, wage, and interest-rate adjustments to maintain an optimal economy, in a manner analogous to Wicksell's and Marshall's work. It remains an unasked question, at least until the General Theory's discussion, whether the Circus' suboptimal equilibrium is possible under price, wage, and interest-rate flexibility. Nor is it asked what is the nature of this equilibrium. It is these questions we wish to take up in Chapter Five.

Price and Sales Expectations

In Wicksell's systematic presentation we see the ex ante/ex post investment and savings relationship come to life, but we lose sight of the repercussive effects of the investment plans activated by one group of entrepreneurs on the sales revenues and profits of all entrepreneurs. In both the systematic and verbal models the difference between ex ante investment and savings is to be revealed by actual or ex post sales and profits or losses different from their expected or ex ante levels. In Wicksell's full-employment economy we may state alternatively that in periods of price instability ex post the output price level differs from the ex ante expected output price level. In the verbal model the sequence is from a particular entrepreneurial group's investment expansion, due to either newly perceived investment opportunities, i.e. a higher natural rate, or a lowered market rate's effect on borrowing entrepreneurs, to a general rise of profits and prices [Wicksell (1898) pp.94-96]. With the general rise in profits the cumulative effect is set in motion. The sequence is from first, particular expected profitability to, second, general realized profitability.

There is a possibility of yet a third development arising from the sequence. As the interest rate differentials continue, the entrepreneur

> ...will be in a position to bear still higher cost without involving himself in a loss... Wicksell (1898) p.99.

and prices will continue to rise. Wicksell in general has entrepreneurs making their production decisions on the basis of the last period's realized price level and revenue level. A third link is introduced when Wicksell allows entrepreneurs' price expectations to

adjust to an environment of persistent price-level changes.

> When prices have been rising steadily for some time, entrepreneurs will begin to reckon on the basis not merely of prices already attained, but of a further rise in prices. Wicksell (1898) p.96.

and

> To put an immediate stop to any further rise in prices, it would not be sufficient for banks to restore the rate of interest to its original level. Wicksell (1898) p.97.

The effect of expecting continuously rising prices is exactly like either the initial market-rate fall or the natural-rate rise, and eliminating the interest-rate differentials will no longer be "sufficient" to inhibit the attempted expansionary entrepreneurial plans [Wicksell (1898) pp.97].

The cumulative process is now underlined by three forces. Prices are set in motion, first by the interest-rate differential, second by the general rise or fall in profitability, and third, by entrepreneurs calculating their output decisions (investment decisions) in an inflationary or deflationary environment.

Output and real investment never actually alter in Wicksell's full-employment economy, except after the initial impact of a change in the natural rate; planned expansions are stalled by limited supplies, particularly of labor. Wicksell describes the "organic development of regular movement of prices" in expansionary periods to be one where price expectations converge on both sides of any transaction to a steady "limiting value" of annual increases [Wicksell (1898) pp.97-98]. A period-by-period steady level of inflation, understood by all parties engaged in exchange, would undermine further expansion from this third force. Wicksell does not develop this line of thought far. For the

price increases to persist, the attempt to expand must persist. Convergent price expectations would undermine the "pleasant surprise" of profits if profits were based on divergent price expectations alone. The interest-rate differentials remain the prime motivating force maintaining the ex post profitability of all entrepreneurs. One might wonder though with repeated failure to expand under full employment, would not entrepreneurs alter their expansion expectations, reversing the demand pressures and the ongoing steady inflation rate? That is not considered by Wicksell, perhaps because before this process can get underway he anticipates that the banking system will begin to intervene, responding to a continued rise in the price level by attempting to protect their reserves. More on this in a moment. Intervention, though, if not completely successful, could at least be expected to alter the time path of price-level developments and require the formation of new entrepreneurial expectations.

As stated above Wicksell does not dwell on the tertiary expectational effects. But he does mention another possible consequence of the tertiary rising prices: "speculation proper," or goods bought simply to be resold "to other speculators" for speculative profits [Wicksell (1898) pp.97-98]. Wicksell is now considering how the crises we stated at the outset punctuate his historically observed price-level trends.

> ...[A]n upward movement of prices acts undoubtedly as a stimulus to the spirit of enterprise; though this advantage is possibly more apparent than real, for it is only too often associated with unhealthy speculation, based on a boom on paper rather than actual economic fact, and culminates in over-expansion of credit, credit disturbances, and crisis. Wicksell (1898) p.2 my brackets.

Would Wicksell consider these avenues of speculative profits a change in the natural rate, or, more important, as a change in the natural rate induced by cyclical price-level changes?

Given his emphasis on stationary real factors as determinants of the natural rate, the answer is no. Keynes in the Treatise will allow for something like this, but like Wicksell he ignores its effect on his analysis.[20] What about in the speculative crash that Wicksell predicts would follow a period of speculative profits? In an economy suffering from speculation,

> Insecure sentiment governs the market; as prices continue to soar and profits are easily earned, the movement may rapidly reach fever-point. There is almost no limit to the rise in prices in spite of the fact that credit becomes more and more expensive. But when prices ultimately come to rest, and the prospect of further profits disappears, the credit position is so strained and the rate of interest is so high as immediately to bring about a contrary movement, which...may rapidly drag down prices even below their normal level. Wicksell (1898) p.98.

Presumably like the cost of credit, a rise in the cost of labor and rented goods would not inhibit the speculative boom. In the downturn of abnormal speculative bursts, unemployment and idle plants will appear. "Business is paralysed, and growing unemployment and falling wages result" [Wicksell (1898) p.2]. Losses are made by entrepreneurs calculating expected proceeds at current prices in a deflationary environment.

> ...[A] low level of prices is often the effect of a previous reduction in wages... Wicksell (1898) p.2.

This causes a reduction in output and employment as entrepreneurs

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[20] Keynes (1930a pp.184-185 p.189) discusses in passing a cyclically dependent natural rate. We will address these passages in detail in Chapter Four.

attempt to reduce costs in line with falling proceeds. Wicksell does not specify what causes the turnaround in a speculative boom, but he is clear that "more expensive" credit, a rise in the market rate, is insufficient [Wicksell (1898) p.97]. We might equally ask, in the name of symmetry, if in a depression caused by a speculative bust, would a lowering of the market rate be sufficient to generate investment and bring workers and plants back on line? Stated another way, is the natural rate effective in cyclical conditions? Wicksell assumes it is, having decided to set such questions "on one side" and take up the question of "the organic development of prices" [Wicksell (1898) p. 98].[21]

The natural rate stands as a stable point towards which the economy gravitates when disturbed, but as Wicksell tells us, it is unobserved, "practically unknown," yet "essential" [Wicksell (1898) pp.167-168].[22] It is the "independent" element, independent from price level and money-rate changes, and presumably independent from output and employment changes, yet how can it be effective, if unknown [Wicksell (1898) p.167]? What effectuates the natural rate in Wicksell's models,

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[21] Patinkin (1952 p.841) writes of this section from Wicksell (1898) on speculative crises that,

> Wicksell's position here seems to be that even in this case the system will return to equilibrium; but the return will be a spiraling one. That is, the market rate will first rise above the real rate, and then, as the anticipated price rises fail to materialise, it will fall back to equality with it. Patinkin (1952) p.841.

On the contrary, why would "the anticipated price rises fail to materialise," when Wicksell has written that "in spite of the fact that credit becomes more and more expensive" prices continue to rise [Wicksell (1898) p.98]? Perhaps this is Wicksellian hyperbole.

[22] Also see Wicksell (1898 p.189).

but expected increased profitable sales, either anticipated with a cost-reduction in the form of a fall in the market rate or realized with an increase in the natural rate? The latter implies a cost-reduction itself or a productivity increase; these lead to increased output with a given investment [Wicksell (1898) p.141]. It does not seem to be a reasonable conjecture that entrepreneurs will anticipate increased profitable sales in the slump conditions following a speculative bust. From symmetry we have argued that Wicksell would not find a cut in the market rate sufficient to raise the "[i]nsecure sentiment" of the market, nor would he be willing to argue that cuts in other costs such as wages, explicitly stated above, and rents lead to anything but further deflation. A statement which is strangely contradictory of the wage and rent flexibility Wicksell asserts is required in a deflationary trend. We can expect little role or purpose for the natural rate in the non-stationary conditions of cyclical crises.

Undue focus on the natural rate and the price-level mechanisms implied by the quantity theory have successfully turned Wicksell's attention from the events occurring in crises or business cycles and from the implied effects of these events on the variables of his model.[23] Although Wicksell can be praised for connecting nominal savings to nominal income through the investment decision, he goes out of his way through the entrepreneurial and capitalistic consumption pattern to maintain real savings at a fixed level. It is not

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[23] See Leijonhufvud (1981 pp.167-168) for a similar characterization of the problem faced by Wicksell and the early Keynes in integrating business-cycle theory into their monetary theories.

surprising that a fall in real income, output, and employment in his description of the crisis misses real savings' dependence on them and its implicit fall. It is also not surprising, given the influence of the natural rate in the determination of the investment decision, that Wicksell overlooks investment's dependence on income in income's determination of investment's prospective profitability. It is our contention that the anomalous "short-period" of crises, anomalous from the perspective of the theory developed around the quantity equation, presents a historical perspective on the development of macroeconomics by presenting the research problems yet to be faced. We have investigated this theme in our discussion of Marshall and will continue it through in our discussion of Keynes' Treatise.

The Banking System and Bank Rate Policy

Throughout the discussion of secular prices or price trends, Wicksell relies upon the banking system to eventually make the necessary bank-rate adjustments. A "neutral equilibrium" is restored with respect to the price level when the market rate and bond rate are bought into line with the natural rate [Wicksell (1898) p.101]. Wicksell also refers to the neutral money rate as the "normal rate" and speaks of the "natural capital rate" as slightly higher than the normal rate due "to the unavoidable risks of enterprise and the like" [Wicksell (1898) p.120].[24] Under an international gold standard, it is exchange-rate and gold-reserve protection that eventually lead banks to increase or decrease their money rate and stem the outflow or inflow of gold reserves. Ultimately the domestic monetary system with elastic

[24] Also see Wicksell (1898 p.102).

credit facilities envisioned by Wicksell is beholden to international specie flow and exchange-rate developments. Reserve protection of reserves in use domestically under a metallic system or bank-note system, both in conjunction with deposits, will also lead to money-rate adjustments [Wicksell (1898) pp.76-77 pp.113-114].[25]

The gold standard and its international repercussions underlie all of Wicksell's examples. In his credit system or elastic monetary system where "the supply of money is more and more inclined to accommodate itself to the level of demand," sustained domestic interest-rate differentials (r_n-r_m) would face international gold-reserve flows, leading the banking system to take corrective measures in the form of market-rate adjustments [Wicksell (1898) pp.110-112]. Even a concerted effort to maintain interest-rate differentials "by every bank in the world, or at any rate in the gold-standard countries", assuming they have elastic domestic credit systems, faces the limit set by the production and industrial use of gold bullion [Wicksell (1898) pp.113-114, (1907) pp.217-218].[26]

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[25] Patinkin (1952 pp.838-840 p.848) notes that Wicksell places more emphasis on the absolute level of reserves and their eventual impact on the market rate, than he does on reserves relative to currency and deposits that are outstanding.

[26] Implicitly, Wicksell's conclusion relies on fixed conversion ratios between gold bullion and bank notes or other credit instruments. Wicksell states that with rising prices,

> [a] fall in the purchasing power of money discourages the production of gold and, other things equal, it increases the consumption of gold in industry. As soon as consumption began to outstrip production the deficiency would have to be supplied out of banks' stocks, for no other source is allowed for. Wicksell (1898) p.113 my brackets.

What leads to the fall in the relative price of gold? Why does it not rise with the general price level? One answer is that the price of bullion in terms of bank notes or credit is fixed domestically and for

Historically, high and rising money rates have been associated with high and rising prices and low and falling money rates with low and falling prices. This is the record of price and interest rate movements that Wicksell has available for the period 1790 to the late 1890s at the time of his writing [Wicksell (1898) pp.168-176]. He further notes that the historical record contradicts the relationship between these two variables implied by the quantity theory.

> But the explanation suggested by the Quantity Theory -- that rising prices are due to an excess of money, falling prices to a scarcity -- does not accord with actually observed movements of the rate of interest. If we are correct, we should expect that at a time of rising prices there would be a temporary reduction in the rate of interest, at a time of falling prices a temporary increase; and that when prices had become accommodated to the change in the stock of precious metal, the rate of interest would once again return to its normal position. Observation teaches us, however, that when prices are rising there is a continual <u>rise</u> in rates of interest, and that when prices are falling there is a continual <u>fall</u> in rates of interest. Wicksell (1898) p.167.

As we have stated, Wicksell presents his natural rate as an "independent factor" behind the observed money rate and price-level movements [Wicksell (1898) p.167].

> ...[I]t is changes...in the natural rate of interest on capital that are regarded as the essential cause of such movements. Wicksell (1898) p.167 my brackets.[27]

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international purposes. A fall in the relative price of gold due to inflation eventually runs down banking reserves for industrial use as notes are converted to bullion. Reserve protection requires a market-rate increase. Similarly, a rise in the relative price of gold due to deflation increases banking reserves as industrial use falls and note conversion expands. Reserve expansion signals a market-rate decrease. Both effects run counter to the initial interest-rate differentials. Abandoning the gold standard with fixed gold prices is not envisioned by Wicksell in these discussions. Ohlin (1926 p.508) reports that from the 1890s to his death Wicksell was "an insistent advocate of a paper standard." See Wicksell (1898 pp.193-194).

[27] Also see Wicksell (1898 p.119).

Changes in the natural rate relative to the money rate of interest lead to the price-level movements. Reversing the causal arrow for empirical and policy purposes, Wicksell infers the movement of the natural rate from the observed price-level and market-rate movements. When the market rate is low or falling, the natural rate is lower or falling faster and prices fall as nominal demand slackens. Costs, wages and rents, fall sufficiently to maintain normal entrepreneurial income, so that real demand is constant and the full-employment level of output is maintained in "the organic development of a regular movement of prices" [Wicksell (1898) p.98]. Similarly, when the market rate is high or rising, the natural rate is higher or rising faster, so prices rise as nominal demand increases. Again, costs rise sufficiently to maintain normal profits and the level of real aggregate demand. Keynes in the Treatise will call the observed relation between prices and the market rate, and the way in which it confounds the quantity theory, 'Gibson's paradox' after A.H. Gibson. Keynes too relies on the underlying movement of the natural rate as the causal factor to explain the observed movements of prices and the market rate [Keynes (1930b) pp.177-186].

For the banking system to stabilize the price level and alter the future course of history by ending the secular or cyclical trends of inflation and deflation, the market rate should be brought in line with the natural rate and should be changed with changes in the natural rate [Wicksell (1898) p.189]. Wicksell points out that "[n]o statistics of the natural rate of interest are available" [Wicksell (1898) p.168 my brackets]. As he also points out, what are available are price-level,

market-rate, and bond-rate movements. As we stated, the natural rate is unobserved, and only its effects are apparent. Wicksell is undeterred. The price level supplies the banking system with enough information. If the price level is stable, leave the market rate as is; if the price level is falling (rising), lower (raise) the market rate [Wicksell (1898) p.189].[28] Our analysis of the limited role for the market rate in Wicksell's description of cyclical crisis suggest that his emphasis on market rate adjustment would be of limited value to establish policy in a crisis. It remains an open question just what policies to pursue in the face of "insecure sentiment of the market."

Conclusion

In Wicksell (1898) we find a clear statement that the natural rate of interest is the real rate of interest that would be determined in a non-monetized stationary economy. It is also clear that the natural rate of interest acts as a "center of gravity" undisturbed by monetary factors. Wicksell's cumulative process of trend price-level movements is motivated by the differences that emerge between the natural rate and the market rate, but these price-level movements are held to leave the natural rate unchanged. Even when the relative structure of production is cyclically transformed by a deviation of the money rate from the natural rate and the perceived profitability of different lines of production change, the economy will eventually resolve itself,

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[28] The bank-rate policy is further extended to the international sphere by a policy of international monetary "co-operation" [Wicksell (1898) p.190]. Countries with unfavorable balances of trade will have their negative balances partially eliminated by surplus countries splitting the difference in market-rate adjustments: the surplus countries inflating and the deficit countries deflating.

with the aid of central bank intervention, at the unchanged natural rate.

We also see very clearly in Wicksell's systematic presentation of the cumulative process the dependence of nominal savings on nominal income, although Wicksell has so contrived his behavioral assumptions that the level of real savings remains constant, and the economy's growth is constrained. Even when he considers a continuously growing economy, increased real savings are introduced not as a function of real income, but to force price-level reductions. The income/savings nexus is not fully developed.

Again we see in Interest and Prices, through a discussion of Wicksell's passing remarks on economic crisis and his remarks on the unobservable nature of the natural rate, the importance of the natural rate in controlling the direction of the economy. We can speculate on an expectational configuration that would leave the natural rate unable to restore a full employment equilibrium. Our speculation is based essentially on asking how the economic actors feel the force of the natural rate -- receive the appropriate market signals -- when it is not observable and its repercussions on prices and profits have been inhibited? But Wicksell remains committed to the natural rate, the role that it plays in maintaining full employment, and importantly its explanatory power when he is faced with the quantity theory of money and its proportional price-level adjustments.

Chapter Three

A Treatise on Money: The Fundamental Equations, Money, and Financial Markets

Keynes' A Treatise on Money develops the Marshallian and Wicksellian themes enumerated above; his contribution in this work might be considered the synthesis of Wicksellian price-level dynamics with a serious consideration of the role of accumulated assets.[1] The latter reflects an elaboration on Marshall's cash-balance approach to the demand for money. Marshall stated that the demand for cash balances will be a function of both an individual's income and an individual's accumulated wealth or "property" [Marshall (1923) pp.43-44].[2] Marshall's focus on wealth allows Keynes to introduce a stock dimension to the demand for money. Keynes poses the question of what form in which to hold one's wealth. Cash balances are one of the possible forms wealth can take, but Keynes in the Treatise also allows wealth to be stored in securities (shares and bonds) [Keynes (1930a) p.222]. In introducing a trade-off between cash and securities, Keynes details an added role for the interest rate to play as it balances against the natural rate of interest. Although Keynes' analysis has the mechanical flavor of Wicksell's, there are passages, almost asides, where the natural rate becomes a function of the market rate and becomes unmoored from the real factors as described by Marshall and Wicksell. These passages occur in Keynes' discussion of two areas:

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[1] The exact extent of Wicksell's influence on the Treatise has been a matter of some dispute; a short appendix to this chapter gathers a cross section of these opinions.

[2] Keynes (1930a pp.205-206) refers to the same passage.

entrepreneurs' anticipated profitability of real investment through the business cycle, and investors' sentiments of financial-market developments. The two are not necessarily mutually exclusive insofar as Keynes ties the demand for real investment to the demand for financial assets. We will find that Keynes uses the natural rate in two senses. One, the "normal" natural rate which arises out of secular developments in a changing economy and corresponds to Wicksell's notion and to Marshall's stationary long-period normal interest rate, and two, a natural rate which is dependent on investors' and entrepreneurs' sentiments about real investment through the business cycle. It is now recognized that Keynes in the General Theory held the state of investors' sentiments constant for the purpose of analytical closure of his short-period model [Kregel (1976) pp.211-214]. In general in the Treatise the state of financial investors' sentiments is allowed to vary with the cyclical developments while actual real investment is tied to the cyclically independent natural rate in our first sense. We will find that Keynes defines his equilibrium as a long-period full-employment equilibrium where the market rate equals the natural rate. A cyclically dependent natural rate opens up the possibility, unexplored by Keynes, of a short-period underemployment equilibrium. Our eyes will be focused on the dynamics of investment expectations, as well as the themes we have developed in our discussion of Marshall and Wicksell.

To a reader recently arrived from Wicksell's Interest and Prices,

the parallels between it and the Treatise will jump from the page.[3] In a passage summarizing previous writings on the bank rate and its causal mechanism, which Keynes had found inadequate until their discussion by Wicksell, Keynes states:

> There remains...one outstanding attempt at a systematic treatment, namely Knut Wicksell's Geldzins und Guterpreise [Interest and Prices]...a book which deserves more fame and much more attention than it has received by English-speaking economists. In substance and intention Wicksell's theory is closely akin...to the theory of this treatise... Keynes (1930a) p.167 my brackets.

A little further on we find Keynes discussing Wicksell's theory of the natural rate and explaining,

> ...I feel that what I am trying to say is the same at root as what Wicksell was trying to say. Keynes (1930a) p.177 fn.3.

Keynes reiterates the "mistaken...neglect of Wicksell" in a reply to Hayek's review of the Treatise [Keynes (1931) p.394, Hayek (1931)].[4] Keynes extends and clarifies Wicksell's theory. For example, in clarification he distinguishes between a monetary cycle initiated by changes in banking reserves from a trade or credit cycle initiated by changes in investment opportunities or the natural rate. The trade or business cycle is addressed in detail; a theoretical explanation is presented for its existence, an explanation based on changing

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[3] Keynes (1930a p.167) supplies his English readers with the German reference; the English translation, by R.F. Kahn, did not appear until 1936. Dimand (1988 p.136) reports the translation was begun in 1929 through "a suggestion by Ohlin to Keynes."

[4] Keynes (1930a pp.175-178) contains an extended discussion of Wicksell (1898). Keynes particularly acknowledges the similarities between the Treatise and 1) Wicksell's concept of the natural rate and price level stabililty and 2) Wicksell's focus on investment as real investment, not simply speculative investment. Speculative investment is what Keynes (1930a p.168) perceives as the focus of Marshall's analysis.

expectations and a period-of-production model. In the Treatise, the monetary and trade-cycle models give rise to distinct cyclical patterns in the market rate and the price level, whereas cyclical patterns in the price level are largely unexplored in Interest and Prices. In further extension, Keynes appends the securities market, financial transactions, and their influence on savings and investment behavior.

Keynes (1930a) raises two criticisms of Marshall's monetary analysis. In the first, he takes issue with Marshall's analysis of the demand for real balances. Keynes (1930a pp.205-208) states that viewing the demand for real balances as a function of "current income of the community" is too narrow a determinant of the demand. It "obscures" the role of business demand and savings demand in the determination of real balances; and having overlooked the latter two, Marshall ignores "disturbances" that can arise from changes in the desire to hold them. It is disturbances in the price level that Keynes is speaking of here. We will find that these disturbances arise out of the savings motive in the course of shifting bull and bear security-market sentiments.

The second issue Keynes (1930a p.168 pp.171-173) raises with Marshallian theory is the influence of the bank rate on investment. It is Keynes' view that Marshall has the bank rate influence speculative investment without a similar influence on investment in plant and equipment. This "lends a false colour" to the role of the bank rate [Keynes (1930a P.172]. Keynes overlooks Marshall's discussion of real investment through the trade cycle, and ignores Marshall's remarks on the smooth trend price-level developments where investment in real

plant and equipment is attempted, but converted into price-level increase due to a full employment economy.

In this and the next chapter, we analyze the Treatise on Money. In this chapter we will develop Keynes' analysis of the fundamental equations, of the natural rate, and of savings, investments, and securities. In Chapter Four we will examine the monetary cycle, the trade cycle, and the natural rate in these cyclical settings. Throughout, the "temporal" environment of the Treatise's analytical framework will be discussed. That becomes important when we consider the short-period analysis of the General Theory and its critique of "classical" monetary theory's long-period stationary-state framework. It is argued in this and the next chapter that although the Treatise advances monetary theory, it is still a captive of the quantity theory, its long-period "natural" values, and its emphasis on price-level movements.

Definitions and Fundamental Equations

Wicksell has the ex post emergence of excess profits or losses stimulate all producers to attempt to expand or retard their level of production. A similar role is reserved for excess profits or losses in the structure of the Treatise. In particular, this role motivates Keynes' fundamental equations.

The theoretical sections of the Treatise, Book III and Book IV, begin with a definition of income that excludes excess profits or losses as Wicksell has been using the terms. In a Marshallian manner, income does include "normal remuneration of entrepreneurs," as well as "salaries and wages," unemployment benefits, pension benefits,

"[i]nterest on capital," and "[r]egular monopoly gains, rents, and the like" [Keynes (1930a) p.111 my brackets]. Money income, as defined by Keynes, is equivalent to "earnings of the factors of production" and "the cost of production" [Keynes (1930a) p.111]. Unemployment and pension benefits are thought of by Keynes as "a charge on industry" on the same footing as wages and salaries [Keynes (1930a) p.111]. Normal remuneration of entrepreneurs is defined

> ...as that rate of remuneration which, if they [entrepreneurs] were open to make new bargains with <u>all</u> the factors of production at the currently prevailing rates of earnings, would leave them under no motive either to increase or to decrease their scale of operation. Keynes (1930a) p.112 my brackets and my underlining.

Profits or above-normal remunerations are the difference between money income and sales proceeds. The definition of normal remuneration, leaving firms with no incentive to change their scale of operation, suggests that profits or above-normal remuneration will invite expansion or attempted expansion of facilities. This is exactly what Keynes through his fundamental equations sets out to show.

Notice that the above suggest that Keynes is working in the Marshallian long-period where changes in the scale of operation refer to the expansion of plant and equipment as well as all other factors due to the influence of above-normal profits. Keynes clarifies his definition here of entrepreneurial income in a 1934 draft of Chapter Six of the <u>General Theory</u>. He states:

> In my <u>Treatise on Money</u> I took as my meaning of income, not expectations which led to the current employment of the capital equipment actually in use, but the expectations which would have led to the original erection as well as the current employment of the equipment actually in use. CWJMK Vol.13 p.425.

The correspondence between the original expectations which led to the investment with those that lead to the investment's current use implies that neither profits nor losses have developed to alter the desired level of plant and equipment. In Chapter Six of the published General Theory, Keynes writes of the Treatise's entrepreneurial income that he meant "in some sense...a normal or equilibrium profit" [Keynes (1936) p.61]. The "sense" suggested is of a long-period equilibrium, where, of course, secular developments would alter the desired "bargains" with factors including capital [Keynes (1930a) p.112].

What is not clear in the above is whether we should characterize the long-period equilibrium as one of stationary-state equilibrium or steady-state equilibrium, or whether Keynes has both in mind. The former is simply a special case of the latter. He does state in explicit contrast to Marshall's Principles and its short-period and long-period static equilibrium that the theory of the Treatise is a "first step towards the theory of a moving system" [Keynes (1930a) p.365].[5] We are not fully prepared to address this question, but we will find the emphasis in the Treatise is on disequilibrium adjustments. Keynes' fundamental equations are designed to reveal these adjustments. The disequilibrium adjustments may simply be what Keynes has in mind in his phase 'moving system,' contrasting it with Marshall's comparative statics. Whether the disequilibrium movements are seen relative to a stationary-state equilibrium or a steady-state one is an open question, and not important from our perspective since both fall under a long-period perspective. We will take up this point

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[5] Also see Keynes (1930a p.xvii).

again after introducing the fundamental equations.

Unfortunately, and distinct from its monetary cycle or theory of trend price-level movements, the Treatise's trade cycle emphasizes short-period output adjustment and not investment in capacity, yet Keynes wants to use the same definitions of normal remuneration and profit.[6] Even in the long-period framework it is not clear what exact meaning to attach to the normal remunerations of entrepreneurs included in money income. Does the normal level of remuneration exclude short-period gains and losses arising from the current output level produced? And so they do not affect the desired level of plant and equipment and the corresponding investment decisions? In long-period equilibrium, both the desired level of plant and equipment and the desired level of output are realized relative to their motivating factors. Keynes is looking at the influence on investment of deviations from long-period normality. His definition of normal entrepreneurial income has placed his analysis in a long-period framework, since it hypothesizes the possible recontracting with all factors of production. This definition may be suitable to his monetary cycle. But in the theory of the trade cycle when he wishes to study fluctuations in output, employment, and short-period price-level movements, short relative to trend movements, the definition becomes problematic. From the outset, at the level of definitions, we can see the anomalous nature of a short-period that is

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[6] Keynes (1930b Ch.30) presents the historical record of the price-level movements that the Treatise is to explain; like in Wicksell (1898) the price-level movements are of two types: secular trends and periods of boom and bust. The chapter includes, again like Wicksell, a discussion of Gibson's paradox. There is no particular reason to recap the historical details, but it is helpful to see that Keynes and Wicksell are attempting to explain the same thing.

in a framework, it will be argued, built up around the quantity theory and its long-period environs.

The long-period or secular-period development affects Wicksell's system through the natural rate. The above questions arise in Wicksell's system, though they are obscured at times by the mode of analysis. The investment decision viewed "lengthwise" is the output decision; investment amounts to the borrowing of the consumption-goods fund to put labor and land, the original factors, through the period of production [Wicksell (1898) pp.124-131]. Viewed cross-sectionally, we have argued that Wicksell is speaking of a fully realized configuration of the desired structure of production in his equilibrium. This parallels Marshall's equilibrium of long-period normal values and now the Treatise's normal equilibrium values. All three have expressed the need to extrapolate from the quantity theory.

Keynes presents the fundamental equations as expressive of an expanded form of the quantity equation. They take their inspiration from Marshall in that income deposits, M_1 in Keynes' notation, are an element in the numerator, rather than total deposits as in the Fisherian form [Keynes (1930a) p.135].[7] But, unlike the Marshallian tradition where final consumption goods would only be found in the denominator, the denominator contains the total output of both consumer goods and investment goods, O [Keynes (1930a) pp.131-135]. Investment goods exclude security-market transactions and therefore ignore another element of Fisher's total-transactions demand for money. In equilibrium, an equilibrium to be further described, Keynes presents P"

[7] Also see Keynes (1930a p.39 pp.205-206).

= $(M_1V_1)/O$, where the undefined terms are the velocity of income deposits, V_1, and the price level of total output, P" [Keynes (1930a) pp.134-135].

Keynes' purpose in presenting monetary theory in the form of the fundamental equations

> ...is to treat the problem dynamically...in such a manner as to exhibit the causal process by which the price level is determined, and the method of transition from one position of equilibrium to another. Keynes (1930a) p.120 my underlining.

His criticism of previous variants of the quantity theory is

> ...they do not...have the advantage of separating out those factors through which...the causal process actually operates during a period of change. Keynes (1930a) p.120.

The emphasis on causality and change, or what now would be termed the transmission mechanism of a disturbance, points again to similarities of critique and purpose between Keynes, Marshall, and Wicksell. They all are seeking a causal explanation of price-level changes. Unfortunately, the fundamental equations are not well-suited to Keynes' purpose. As we will see momentarily, they are defined for a prescribed period of time and have been shown to break down when they are interpreted to hold over time or to make comparisons between time periods, since technical change can be expected to affect at different rates over time two elements held constant in the fundamental equations: the consumer-goods and the investment-goods output levels [Hansen (1932), Hansen and Tout (1933)]. But even so, they reveal the existence of profits within their prescribed time period, to which Keynes attaches behavioral significance; investment is a function of profits. The emergence of ex post profits or losses leads entrepreneurs to alter their ex ante expectations of profit and losses

and further leads them to attempt to alter their scale of operations. Expansion or contraction has an impact on the price level.[8]

The fundamental equations can be derived with the addition of a few more definitions in conjunction with Keynes' definition of money income. Savings is "the difference between the money income of individuals and their money expenditure on current consumption," and the nominal value of investment is "the value of the increment of capital during any period" [Keynes (1930a) pp.113-114]. Keynes uses the following symbols for variables [Keynes (1930a) p.121].

E: money income = earnings of the factors of production = cost of production.

I': E earned in investment-goods production = cost of production of new investment goods.

E-I': cost of production of consumption goods.

S: savings.

E-S: expenditure of money income on consumption goods.

Keynes defines his "units of quantities of goods" with the expectation that the resulting fundamental equations are comparable between periods [Keynes (1930a) p.121]. He proposes we measure units of goods

> ...in such a way that a unit has the same cost of production at the base date... Keynes (1930a) p.122.

Using the fundamental equations to reveal current profits, to which we

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[8] Shackle (1974 p.23) presents a similar view of Keynes' fundamental equations. Keynes (1936 p.77 fn.1) states of the Treatise:

> My method there was to regard the current realized profits as determining the current expectation of profit.

That view is consistent with that of Shackle's and the one presented here. Also see Dimand (1988 p.54) where again the same view is expressed.

suggest Keynes attached causal importance since they motivate investment, a current-period definition of units would suffice. We could replace "at the base date" with 'in the current period' in the above definition. The 'units' are in fact nominal values now, so we would further require price and quantity indices to demonstrate the influence of profits on prices. Under Keynes' original definitions the units are deflated nominal values.

To continue with Keynes' symbolism [Keynes (1930a) p.122]

O: total output of goods.

R: output of liquid consumption goods and services.

C: net increment of investment goods.

$O = R + C$.

P = price level of liquid consumption goods.

PR: current expenditure on consumption goods.

$E(C/O) = I'$: the cost of production of new investment goods.

The first fundamental equation for the price level of consumption goods follows [Keynes (1930a) p.122].

Since $PR = E-S$

$= (E/O)(R + C) - S$

$= (E/O)R + I' - S$

then $P = (E/O) + (I' - S)/R$. (Equation 1)

Further Keynes defines

P': the price level of new investment goods.

P" : the price level of total output.

$I = P'C$: the value of the increment of new investment goods, which is distinct from I', its cost.

The second fundamental equation for the price level of total output follows [Keynes (1930a) pp.123-124].

$$\text{Since } P'' = (PR + P'C)/O$$

$$= [(E - S) + I]/O$$

$$= E/O + (I - S)/O. \quad (2)$$

It is possible to derive a third equation for the price level of new investment goods by substituting (1) and (2) into the initial equation for P" and remembering R = O-C [Hayek (1931) p.283].[9]

$$P' = E/O + (I - I')/C. \quad (3)$$

Keynes does not present us with equation (3), but uses the price level of new investment goods to begin a discussion of security markets and investors' bearish and bullish sentiments [Keynes (1930a) pp.127-129]. We will turn to this discussion in a moment because of its importance in determining Keynes' meaning and use of the natural rate of interest.

Keynes develops his fundamental equations in two directions, introducing wages and profits explicitly. The first term, E/O, or the rate of earnings per unit of output, Keynes labels as W_1 and calls "the rate of efficiency earnings." He wants to replace efficiency earnings with "the rate of earnings per unit of human effort," W, something like earnings per labor-hour, and does this by defining an efficiency coefficient, e, "so that $W = eW_1$" [Keynes (1930a) p.122]. The first

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[9] Substituting into P" = (PR + P'C)/O as described in the above text leads to E/O + (I - S)/O = {P'C + R[E/O + (I' - S)/R]}/O or (E + I - S) = P'C + R(E/O) + I' - S. So P' = [E(1 - R/O) + I - I']/C = E[1-(O - C)/O]/C + (I - I')/C = E/O + (I - I')/C. Hayek (1931 p.283) derives this equation, but the reader should be aware of a math error in his derivation.

term of the fundamental equations becomes W_1 or (W/e) since $E/O = W_1 = (W/e)$. Introducing the rate of labor earnings per unit of time, W, allows Keynes to discuss price-level changes arising either "spontaneously" in the labor market or as the effects of monetary-cycle or trade-cycle "induced" changes in W [Keynes (1930a) p.151]. Induced changes in W arise dependent on cyclical changes in the price level of consumption goods; these are adjustments made to maintain the standard of living. Spontaneous changes in W arise from, for example, growth in trade-union and collective-bargaining strength independent of changes in the price level of consumption goods.

Keynes' discussion of the first term of the fundamental equations focuses on labor and wages and ignores the other components of earnings: normal entrepreneurial remuneration, interest on capital, and monopoly rents. Presumably these elements, too, alter the real standard of living for their recipients through inflationary and deflationary periods and are subject to changes in the market power of their controlling parties.

More important to our immediate concern, Keynes shows the numerators of the second terms of his fundamental equations (and our third equation) are equal to the excess profits or losses. Subtracting from the market value of their sales the cost of production of consumption goods and investment goods, Keynes demonstrates profits in the consumption-goods sector are $Q_1 = PR-(E/O)R = E-S-(E-I') = I'-S$ and profits in the investment-goods sector are $Q_2=I-I'$. Joint profits are $Q = Q_1+Q_2 = I-S$ [Keynes (1930a) p.124]. The fundamental equations now appear as

$$P = W_1 + Q_1/R \quad (1a)$$

$$P'' = W_1 + Q/O \quad (2a)$$

and $$P' = W_1 + Q_2/C \quad (3a)$$

The importance of Keynes' definition of money income excluding excess profits, plus or minus, or what he simply calls 'profit,' is emerging. The existence of profits will alter the general price level, P", and its components P and P' relative to their level at cost, everything else held constant.

There is something peculiar about these equations. Notice that in conditions of zero profits, a condition Keynes will define as equilibrium, the three price levels are equal. There is no relative price difference in equilibrium, and relative price differences occur due to differential profits per unit of respective output levels in disequilibrium. Keynes states P" = P in equilibrium, but does not elaborate [Keynes (1930a) p.135]. But it is also true that P"=P'=P. Harrod presents a version of the first fundamental equation [Harrod (1951) pp.433-434] and his method also can be applied to the third fundamental equation so that relative price differences emerge.[10] Through it we can also overcome the Hansen and Tout criticism [Hansen (1932), Hansen and Tout (1933)]. To derive the first and third fundamental equations we relied on E(C/O)=I', and implicitly when the equations are used to make comparisons over time it is assumed that C/O is constant. Changes in I' are attributed to changes in the level of earnings, E, not to a change in the proportion of capital goods to

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[10] Harrod's derivation is a variation on the method suggested and formalized in Hansen and Tout (1933 p.124).

total output. The assumption of a constant C/O ratio gave rise to Hansen and Tout's criticism. They stated that the likely differential rates of technical change in consumption-goods production and in investment-goods production would alter this ratio and undermine the direct relationship between changes in earnings and the costs of production of investment goods. Harrod's variation on Keynes' derivation arrives at a slightly different first fundamental equation, but one that will suffice to underline the relationships between investment, saving, and profit.

Harrod defines E_r as earnings from consumption-goods production and E_c as the earnings from investment-goods production, so that total earnings equal $E = E_r + E_c$ and $E_c = I'$. Total expenditure on consumption goods is again PR and

$$PR = E-S$$
$$= E_r + E_c - S$$
$$= E_r + I' - S$$

So $P = E_r/R + (I'-S)/R.$ (1b)

Also note that $PR-E_r=I'-S=Q_1$, or sales revenues minus costs equals consumption goods' profits. Harrod's version of the first fundamental equation varies only in the first term where E_r replaces E, and R replaces O, and he remarks that it "serves equally well" for Keynes' purposes [Harrod (1951) pp.433-434]. Relying on the definition of profits in investment-goods production, we can arrive at a similar formulation of our third equation.

$$Q_2 = I-I'$$
$$= P'C - E_c$$

so $P'C = E_C + Q_2$

or $P' = E_C/C + (I-I')/C.$ (3b)

This equation also varies from our earlier version of the third equation in the first term on the right-hand side, where E_C replaces E, and C replaces O. The second fundamental equation is already free from Hansen and Tout's criticism; the above variations are now also free of their criticism. These versions will suffice, since the fundamental equations are used in the Treatise to demonstrate the relationships between investment, savings, and profits, and their effects on the various price levels. Note that at the equilibrium zero-profits condition, relative prices differ.

Keynes claims that the fundamental equations "are purely formal; they are mere identities; truisms which tell us nothing in themselves" [Keynes (1930a) p.125]. They follow from Keynes' definitions and he speaks at times as if they embody no behavioral assumptions. But behavior does appear in his definitions, particularly that of the normal remuneration to entrepreneurs, which is defined so that firms receiving such will not desire to recontract with any inputs and alter their scale of operations. These firms are satisfied, are in equilibriums, at least with respect to their scale of plant and equipment. When introduced earlier it was ambiguous whether normal remuneration implies an equilibrium output level. But it is easily seen that the zero-profits equilibrium condition implies that each price is equal to the average cost of producing the good, which implies long-period equilibrium.

> In equilibrium, therefore, both the value and the cost of current investment must be equal to the amount of current

> savings, and profits must be zero; and...the purchasing power of money and the price level of output as a whole will both correspond to the money rate of efficiency earnings of the factors of production... Keynes (1930a) p.137.

We shall see, though, that since a long-period equilibrium is implied, and the emergence of profits and losses calls for adjustments in plant and equipment, it will be hard for Keynes to motivate short-period output adjustments through his fundamental equations in a trade cycle that holds plant and equipment constant.

Keynes' next task is to breathe some life into his formal fundamental equations "by the introduction of extraneous facts from the actual world" and to reveal what behavior determines the level of our various prices [Keynes (1930a) p.125]. He identifies profits, having come into being for whatever reasons, as "the mainspring of change in the existing economic system" [Keynes (1930a) p.126], and says that profits "save them [the fundamental equations] from the character of being mere identities" [Keynes (1930a) p.141 my brackets].

> For if either Q_1 or Q_2 is not zero one class of entrepreneurs will have an incentive to expand their output; and if total profits Q are not zero, the entrepreneurs will tend, so far as they can, to alter the volume of employment which they offer to the factors of production at a given rate of remuneration--upward or downward, according as such profits are positive or negative. Keynes (1930a) p.136.

The emphasis on output and employment in the above quote derives from Keynes' broad definition of capital and investment; we will attempt to clarify this in a moment. Taking his lead from Wicksell, Keynes pronounces that the prime cause of the excess profits or losses is a discrepancy between the natural rate and the market rate of interest; the natural rate is defined as the market rate where $Q = I-S = 0$ or where the market value of investment is equal to the level of savings

[Keynes (1930a) pp.137-139]. Actual profits are an effect and the prime cause is the initial discrepancy between the natural and market rates. The differential rates lead to attempted expansion of plant and equipment through investment.

The causality is the same as that identified by Wicksell.

> ...[H]e [Wicksell] was the first writer to make clear that the influence of the rate of interest on the price level operates by its effect on the rate of investment, and that investment in this context means investment not speculation. Keynes (1930a) p.177 my brackets.

We have seen that in Wicksell, alterations in the market rate of interest offset current costs and allow expansion or contraction of the other factors: labor and land. We will see that in the Treatise the market rate of interest operates as a discount rate on the future income stream expected from durable investment. Durability was sidestepped in Wicksell by making non-liquid capital into a quasi-rent good on the same footing as land and included with land, and by his choice to ignore a change in the bank rate's effect on the structure of production. Although modeled differently, the market interest rate is the mechanism of change. Marshall, Wicksell, and Keynes identify the interest rate as the factor that lies behind the quantity equation in determining the purchasing power of money.

Keynes states the quantity equation as an equilibrium condition.

> ...[I]f the quantity of money were double the price level would be double also.
>
> But this simple and direct relationship [the quantity equation] is a phenomenon only of equilibrium... Keynes (1930a) p.132 my brackets.

He goes on to present his own algebraic formulation of the quantity equation, derived from his fundamental equations under the assumption

of equilibrium, or $Q = I-S = 0$. We have seen this already. Keynes defines M_1 as "the total of the income deposits" and V_1 as "their velocity of circulation" or "the ratio of money income (E)...per unit of time to M_1," so that $E = M_1V_1$ and $P' = P = (M_1V_1)/O$ [Keynes (1930a) p.134]. Keynes characterizes the equilibrium under discussion as a "long-period or equilibrium norm of the purchasing power of money" [Keynes (1930a) p.137]. Keynes' long-period equilibrium is defined when his fundamental equations are reduced to the quantity equation. All three of our equations (1a) - (3a) imply that "equilibrium requires that Q_1, Q_2 and Q should all be zero," or $I' = I = S$ [Keynes (1930a) p.137]. Keynes states that "the economics of the short-period" are under consideration when there is "a disequilibrium between saving and investment" [Keynes (1930a) p.145].

To appreciate further Keynes' sense of the long-period and the short-period requires knowledge of what he classifies as investment. Investment in turn requires a knowledge of what constitutes capital in the Treatise's framework.

> The stock of real capital...is embodied in one...of three forms:
>
> (1) Goods in use, which are only capable of giving up gradually their full yield of use or employment.
>
> (2) Goods in process, i.e. in the course of preparation by cultivation or manufacture for use or consumption, or in transport, or with merchants, dealers and retailers, or awaiting the rotation of the seasons.
>
> (3) Goods in stock, which are yielding nothing but are capable of being used or consumed at any time. We shall call goods in use fixed capital, goods in process working capital, and goods in stock liquid capital. Keynes (1930a) pp.115-116.

The investment level flow per period or "the rate of investment" is "the net increment...of the capital of the community" [Keynes (1930a) p.114]. Investment in type (1) capital goods corresponds to the

economist's conventional view of investment in plant and equipment. Investment in type (2) capital goods corresponds to an expansion of current output and resembles the short-period adjustments of Marshall's Principles. Hawtrey's inventory cycle made type (3) a central explanation of the trade cycle [Keynes (1930a) pp.173-175]. Keynes' sense of investment is clearly quite broad, as broad as his sense of what constitutes capital. Keynes carries this broad definition of capital and investment over to the General Theory [Keynes (1936) p.75].

Although we might agree that each is a component of capital, it makes it difficult, as we will see in a moment, to align Keynes' use of the long-period and the short-period with Marshall's use of these terms. By defining capital and investment so broadly, Keynes may focus on a particular component of investment at the expense of the others. This is not a particular drawback if type (1) investment, fixed capital, is under discussion, since it tends to imply type (2), if not type (3). But if type (2) investment, working capital or goods in process, is under discussion, it does not imply type (1) fixed capital investment. This is not an idle point and we will see that the Treatise's monetary cycle is dominated by type (1) investment, as well as the Treatise's description of the natural rate. Meanwhile, the Treatise's trade cycle is dominated by type (2) investment. Keynes does not alert the reader that two distinct adjustment processes are under discussion because he does not appear to be impressed by the importance of the distinction.

Keynes' short-period disequilibrium and long-period equilibrium defined relative to I', I, and S differ from Marshall's use of the

short-period and the long-period as presented in the Principles. First, it should be clear that Keynes is referring to the disequilibrium or equilibrium of the macrosystem or at least large subsectors and their influence on each other. He is not referring to Marshall's ceteris paribus isolated micro-units. Second, by definition, in the Treatise there is no short-period equilibrium and the short-period disequilibrium has investment taking place, with plant and equipment coming on line and/or output adjustments. Through Marshall we have come to think of the short-period and its equilibrium as a period in which entrepreneurs, given existing plant and equipment, adjust their output level to the existing or anticipated level of market demand. Investment that may be taking place is not allowed to affect short-period production decisions, which are confined to existing capacity and demand. If investment excludes the Treatise's type (1), then Marshall's short-period adjustments and his short-period equilibrium would coincide with the Treatise's short-period disequilibrium and its long-period equilibrium. Further, if the effect of type (1) investment is segregated or ignored, as it is in Keynes' discussion of the trade cycle, then again the Treatise's short-period and long-period distinction corresponds to Marshall's short-period and its equilibrium.[11] Third, again through Marshall's analysis we have

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[11] Carabelli (1988 p.223) writes that in the Treatise "all expectations were conceived as...short-run expectations" since they are determined "by current results." We have quoted Keynes (1936 p.77 ft.1) and the quote would show agreement. What is perhaps not made clear is that short-run expectations in the Treatise are determining investment decisions which can be, but are not necessarily, simply output decisions in Marshall's short-period sense. It is in the Marshallian short-period sense that short-run expectations determine output and employment in the General Theory, given the level of plant

grown accustomed to the long-period as a period in which we modify the ceteris paribus clause and allow firms to adjust their capacity to fully exploit current market and anticipated market developments within the context of given technological options. The firms' long-period equilibrium occurs when the adjustment of plant and equipment is made relative to demand conditions and net investment comes to an end.

In Keynes' long-period equilibrium, net investment is permissible as long as it is balanced against the same level of net savings; and we must assume that capacity growth is balanced against growth of demand. Long-period disequilibrium is ruled out, so that when type (1) investment is occurring and its effects are recognized, the short-period disequilibrium of the Treatise corresponds to Marshall's long-period disequilibrium. If net type (1) investment is occurring, balanced by net savings, then the Treatise's long-period equilibrium differs from the static stationary state of Marshallian long-period equilibrium and raises the prospect of steady state growth.[12] Keynes

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and equipment in place. Long-run expectations determine investment decisions in plant and equipment [Keynes (1936) pp.46-48]. These are not clearly distinguished in the Treatise, but by the time the General Theory is written Keynes interprets the Treatise as if they were. He writes that:

> ...an expected increase in investment relatively to savings as defined in my Treatise on Money [is]...a criterion of an increase in effective demand. Keynes (1936) p.78 my brackets.

The increase in effective demand which "will induce" increased employment and output arises from an initial desire to increase investment in plant and equipment [Keynes (1936) p.78].

[12] Dimand (1988 pp.26-28) interprets the equilibrium of the Treatise as a steady-state growth path with the disequilibrium dynamics as deviations from the growth path. This is one possible interpretation "[s]ince investment is not constrained to equal depreciation" [Dimand (1988) p.28 also see p.36. p.40 p.54 p.95 my brackets]. Dimand (1988 p.29) states that the Treatise does not concern itself with output determination, since it assumes full

writes:

> ...[T]he secular trend...we have already allowed for in our hypothetical conditions of equilibrium... Keynes (1930a) p.233 my brackets.

and

> Assume also -- if our community is a progressive one -- that the supply of money is being increased at the same steady rate as that of general output... Keynes (1930a) p. 231.
>
> A state of disequilibrium may be said to have been initiated by...[a] change in the total quantity of money which does not correspond to the secular trend in general economic activity... Keynes (1930a) p.232 my brackets.

Even more telling of the Treatise's disequilibrium short-period is the following passage with its attached footnote.

> There is another generalization which, in passing, we may note -- one relating to the length of the economists' 'short periods.' A 'short period,' it would seem, thinks nothing of living longer than a man. A 'short period' is quite long enough to include (and, perhaps to contrive) the rise and the fall of the greatness of a nation. Keynes (1930b) p.141.
>
> Adam Smith did not under-estimate the length of short periods. 'Ninety years' he wrote, 'is time sufficient to reduce any commodity, of which there is no monopoly, to its natural price.' Keynes (1930b) p.141 fn.3.

The above directs us back to our interpretation of long-period stationary-state values in Marshall's Money, Credit, and Commerce as the implicit equilibrium values Keynes is now discussing. But only if net type (1) investment is zero in the Treatise's long-period

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employment persists; output only varies with "past investment decisions and exogenous factors" such as population and resource growth. We will see that the Treatise generally reasons within the confines of a stable natural rate which implies either a stationary state or the perfect steady-state balance between population growth, resource growth, and technical change. Output does vary in the Treatise; it is partially the subject of the Treatise's trade-cycle analysis; and in this context, "past investment decisions" do not imply steady-state growth.

equilibrium will it coincide with Marshall's stationary-state long-period equilibrium.

Keynes is potentially speaking of an equilibrium growth path, should the level of savings be sufficient to cover net type (1) investment. Arguing against the view that net investment is occurring is the general lack of consideration of changes in the level of output and employment. The latter two are addressed as special cases either in the trade-cycle analysis, as distinct from the monetary cycle's trend price-level theory, or due to changes in the natural rate. Viewed from the perspective of Marshall's Principles, a perspective that Keynes suggests we take, the Treatise's disequilibrium analysis is "a first step towards the theory of a moving system," and is a step away from static equilibrium theory. The implied comparison suggests that Keynes is addressing the dynamics presupposed in the Principles' comparative static analysis [Keynes (1930b) p.365].[13] At the same time, Keynes has elevated the analysis to considerations of the macroeconomy.

Interpreting Keynes' equilibrium is not an easy task. Keynes further does not present his equilibrium as a simple dynamic generalization of Marshall's long-period static equilibrium applicable to each firm in the economy. Keynes permits both

> ...profits of particular entrepreneurs or particular classes of entrepreneurs [to be]...positive or negative...with the prices of particular commodities rising or falling. Keynes (1930a) p.137 my brackets.[14]

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[13] Also see Keynes (1930a p.xvii).

[14] An analogy with Marshall's representative firm appears to be present here, Marshall (1920 pp.264-265 pp.313-314 pp.380-381).

These must be subclasses of investment-good entrepreneurs and consumption-good entrepreneurs and their respective subclasses of products, for we have an equilibrium condition of zero profits and $P' = P = P''$. A sufficient condition for this is either $Q = I-S = 0$ and $Q_2 = I-I' = 0$ or $Q = 0$ and $Q_1 = I'-S = 0$ either implies $Q = I-S = I'-S = Q_1 = 0$ and rules out the possibility of $Q_1 = -Q_2$ or $-Q_1 = Q_2$ which could follow from a simple zero aggregate-profit condition or Keynes' definition of the natural rate as that value of the market rate where $Q = I-S = 0$. Keynes does not make his equilibrium condition clear; he speaks at times as if zero aggregate profits is sufficient [Keynes (1930a) pp.136-137]. If we adopt Harrod's formulation of the fundamental equations, differences in equilibrium relative prices are permitted, but Keynes still clearly does not want his equilibrium to contain offsetting sectoral profits [Keynes (1930a) p.136], and the sufficient conditions again hold, ruling out offsetting subsector profits.

The differential profit rates and the changing relative prices in the above quote suggest that Keynes could also be considering developments where neither the technological options nor the structure of demand is constant. Keynes could have in mind a secular period in which his theories are to be considered. This resembles Marshall's secular period where technology and tastes are freed from ceteris paribus and allowed to change. In fact we will see that Keynes has a rather Schumpeterian view of technological change. But these secular developments must be confined, somewhat arbitrarily, so that either the aggregate price level of consumption goods does not change relative to

the aggregate price level of investment goods or sectoral offsetting profits do not emerge, if the long-period equilibrium is to be maintained. We have in effect Dimand's steady-state growth interpretation [Dimand (1988) pp.26-28].

There is a further point worth noting about the fundamental equations. Keynes tells us their equilibrium implies "the factors of production are fully employed" [Keynes (1930a) p.132]. But even when out of equilibrium, although profits give entrepreneurs incentive to expand capacity and/or utilize capacity more intensely, it is the price level which is under discussion, not the level of output or employment. The fundamental equations, presented by Keynes as identities, have the price levels on the left-hand side. He tends to speak of the price levels as the dependent variables, dependent on changes in the nominal values on the right-hand side, the level of output held constant. Keynes considers changes in output and employment, sometimes as asides and more centrally when he considers the trade cycle, but their influence on price levels is not direct. Changes in output and employment work through changes in money values, for example wages, so that for the purpose of analysis full employment is either maintained or quickly achieved. We will see in the next chapter the emphasis on price-level changes leads Keynes to contrived scenarios when he attempts to explain the trade cycle.

Keynes does not present us with categories of employment or unemployment; this further emphasizes his disregard for their alterations in the processes he is describing. He presents instead two general categories of inflation and deflation, an income type and a

profit type, and the profit type is further subdivided into commodity and capital inflation or deflation. These categories correspond to the right-hand terms of the fundamental equations and are the sole devices used to explain the left-hand side price levels.

> ...[I]ncome inflation (or deflation), correspond[s] to changes in the first term of the fundamental equation. Keynes (1930a) p.141 my brackets.

Possible changes in $W_1 = E/O$ are not considered to arise from changes in O, total output, or employment. Changes in W_1, as mentioned earlier either arise spontaneously through trade-union and collective bargaining activity or are induced through entrepreneurs' attempted expansion building pressure in the labor market.

Similarly, Keynes' two forms of profit inflation or deflation are introduced as explanatory categories to cover changes in the left-hand side price levels due to factors affecting the second terms of the fundamental equations.

> ...[P]rofit inflation (or deflation) is the sum of the two terms, Q_1 and Q_2, which we call commodity inflation (or deflation) and capital inflation (or deflation) respectively. Keynes (1930a) p.140 my brackets.

Alternations in the total price level, P",

> ...are measured by the sum of the income inflation and the profit inflation; whilst those in P, the purchasing power of money [consumption good price level], are measured by the sum of income inflation and commodity inflation. Keynes (1930a) p.140 my brackets.

The discussion corresponds to the second and first fundamental equations respectively, and makes no mention of output and employment. Our third fundamental equation, (3) or (3a), shows the price level of new investment goods, P', determined by income and capital inflation or deflation.

Keynes' mission in the Treatise is to explain changes in his price levels; changes in output and employment are subsidiary questions. His theories of the monetary cycle and the trade cycle are built around price-level changes, which the fundamental equations in turn explain in terms of profits and income. Perhaps it is because price levels are central to Keynes' argument, and not output levels, that when he draws his broad definition of capital and investment, he does not distinguish the forces at work on the various components of capital and investment broadly defined. Profits predominate in Keynes' explanation. Profits depend on the determinants of the savings level, the cost of investment, and the market value of investment. We turn now to the determinants of these three variables, and the disproportions that may develop between them. The latter disproportions will lead us into Keynes' cyclical theories.

Investment, the Natural Rate, and Savings

Already we have some idea of what will motivate Keynesian entrepreneurs over the course of cyclical developments: a differential between the natural rate and the market rate and the profits or losses that differential rates generate. The premise of the mechanism is Wicksellian; in general the persistence of profits leads to continued attempted expansion and continued rise in the price levels under consideration. There is some parallel to Marshall's speculative profit making in the Treatise's analysis of business cycles, but as we have seen, Keynes finds Marshall's emphasis on speculative investment incomplete. In Keynes' general discussion of investment it is clearly a problem of capacity investment decisions and expected long-period

economic development for Keynesian entrepreneurs when they consider recontracting with all inputs and expand or contract capacity.

> The attractiveness of investment depends on the prospective income which the entrepreneur anticipates from current investment relatively to the rate of interest which he has to pay in order to be able to finance production; or, putting it the other way round, the value of capital goods depends on the rate of interest at which prospective income from them is capitalized. Keynes (1930a) pp.138-139.

Capitalization or discounting is normally associated with fixed capital or inventories, not with goods in process; it is the first two which persist over time. In Vol.II of the Treatise, Keynes links the market rate to fixed capital investment [Keynes (1930b) p.86] and only indirectly connects working capital to the market rate though the market rate's effect on fixed capital [Keynes (1930b) p.91]. In Vol.I he questions the linkage between liquid capital investment and the market rate, particularly in his criticism of Hawtry's trade cycle, a theme taken up again in Vol.II [Keynes (1930a) pp.173-175, (1930b) pp.117-118]. As we proceed it will become clear that generally Keynes has fixed capital in mind when he speaks of investment in his monetary cycle, and unless explicitly stated we will adopt this convention when speaking of investment in general. Working capital will dominate in his theory of the trade cycle. The "value" of a capital good is what later in the General Theory Keynes will call the "demand price of the investment" [Keynes (1936) p.137]. The lower (higher) the market rate of interest the more (less) attractive investment projects become, or stated alternately, the higher (lower) their demand price. What is not clear is how the concept of the value of capital goods relates to either the market price of new investment goods, P', or the cost of

production of new investment goods, I'. Keynes is presuming a nearly fixed supply of new investment goods, C, and equates an increase in their demand price with an increase in their market price, P'. The effect then of a decrease in the market rate on the fundamental equations is to alter the price of new investment goods, P', and possibly their quantity, C, so that the market value of new investment goods, I = P'C, increases in the second fundamental equation. We shall see that the increase in I is relative to the savings level, S, and drives up the total price level, P", due to the second term in the second fundamental equation. This is an initial effect and its full ramifications must wait for the particulars of Keynes' various cyclical scenarios.

The interest rate is one factor determining the demand price of new investment goods; a second factor is the "prospective income" or prospective-income stream that entrepreneurs expect to receive from an expansion of plant and equipment. Changes in this factor, that is, changes in expected profitability at a given market interest rate, are particularly important when Keynes considers an explanation for the trade cycle, in spite of the latter's output adjustment focus. Keynes presents some examples of factors determining prospective income and entrepreneurial expectations:

> ...for example, a new technical discovery, such as steam or electricity or the internal-combustion engine, or a shortage of houses due to growth of population, or more settled conditions in a country where previously the risks of normal development had been excessive...Keynes (1930a) p.254.

Keynes quotes a passage from Mitchell's (1927) Business Cycles that paraphrases Schumpeter's views on entrepreneurial innovation which

include the above technological advances plus "new markets," "new resources," and "shifting trade routes" [Keynes (1930b) pp.85-86]. Without a compensating change in a community's savings behavior these alterations in prospective profitability require a change in the market rate to bring the market value of new investment goods into line with the level of savings; that is, these alterations require a change in the value of the market rate that is the natural rate. "[A] change in the attractiveness of investment" alters the value of the natural rate [Keynes (1930a) p.232].

The other determinant of the natural rate is the rate of savings [Keynes (1930a) p.232].

> The rate of savings...is stimulated by a high rate of interest and discouraged by a low rate. Keynes (1930a) p.139.
>
> In the case of savings, the effect of a change in the interest rate is direct and primary and needs no special explanation, though the amount of the effect may often be quantitatively small in practice... Keynes (1930a) p.180.

For the Keynesian individual the rate of savings is sensitive to the interest rate, but not highly. Keynes also speaks of "the division of income between savings and expenditure on consumption" [Keynes (1930a) p.123] and:

> When a man is deciding what proportion of his money income to save, he is choosing between consumption and the ownership of wealth. Keynes (1930a) p.127.

Keynes is close to articulating a relationship between nominal income and nominal savings, and therefore between changes in nominal income and changes in nominal savings, but the pronouncement does not materialize.[15] When Keynes comes to discuss the effects of changes in

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[15] Also see Keynes (1930a pp.154-155).

the market rate, particularly its deviations from the natural rate, he focuses primarily, if not exclusively, on its effects on the market value and the cost of investment goods, I and I' respectively. With an increase in prospective profits, the higher natural rate requires a higher level of savings to restore equilibrium between I and S; that is, ex post savings rise to eliminate the excess profits. Keynes states:

> When the increased investment represents an increase of working capital, the act of saving is required...immediately. But when there is a changeover in the character of production which will lead later on to an increased output of fixed capital, the additional saving is only needed when the process of production is finished. Keynes (1930a) p.251.

Presumably, though Keynes does not state it, the higher savings level will come as a consequence of the higher costs of production or earnings; that is, nominal savings rises with nominal income. So that given our earlier discussion of Keynes' equilibrium conditions, not only I equals S, but I equals I' and I' equals S and all three price levels have no tendency to change.

But Keynes does not specify the income/savings relationship. He states:

> The business of saving is essentially a steady process. If there are disturbances in the economic world, these by affecting prosperity may react on the rate of saving. Keynes (1930a) p.251.

Later he writes that the slump of 1930 has "encouraged saving" and "probably increased saving" [Keynes (1930b) p.176]. The first quote implies that Keynes in the Treatise sees savings, as Marshall (1920) did, as growing over secular periods with secular income growth. The second quote has savings and income inversely related over short-period

crises; that is, the marginal propensity to save rises with a fall in income. Generally in his adjustment process he focuses his attention, if he considers the flow of savings at all, on the relationship between interest rates and savings flow.

The above list of factors affecting investment prospects represents changes in conditions of supply, technology, and the extent of the market; it parallels Wicksell's discussion of the determinants of the natural rate, as well as Marshall's discussion of secular developments and their effects on the prospective profitability of investment. Changes in technology and supply alter the value of the market rate which is also the natural rate; under this interpretation, changes in the natural rate are effectively changes in entrepreneurial long-period expectations given an initial long-period equilibrium. An alteration in the natural rate signals a change in the technological environment, market extension, and supply conditions in which long-period investment decisions are made. Keynes' analysis implies that the state of technology and the level of market saturation defines a moment in the phase of a technological epoch, and insofar as they can be known, they supply an objective basis for entrepreneurial investment expectations. Long-period investment expectations and a somewhat interest-elastic supply of savings define the context in which other factors working through the fundamental equations operate. Given a state of long-period investment expectations, a natural rate emerges when savings behavior is introduced; the setting at this intermediate stage in the Treatise is essentially a loanable-funds model of the interest rate. Bringing to mind the criticism that Keynes presents of

the loanable-funds theory in the General Theory [Keynes (1936) pp.178-185] it is interesting to note that neither real income, output nor employment is made a central determinant of either investment or savings at this stage. We shall see that in the Treatise's monetary cycle Keynes tends implicitly to assume a full-employment level of savings and that, like Wicksell, attempted expansion proceeds from full employment with a fixed level of real savings.

But Keynes introduces a second set of factors affecting investment broadly defined; they are important in his trade-cycle analysis. Entrepreneurial expectations are altered through

> ...a capital inflation [I-I'>0] due to psychological causes, or a reaction stimulated by cheap money from a previous period of under-investment, i.e. a previous slump. Keynes (1930a) p.254 my brackets.

Keynes sums up the psychological causes under "a return to 'business confidence'" [Keynes (1930a) p.271]. The reference to slump conditions, which will also characterize the trade cycle, suggests a different sense of the natural rate than the full-employment one just outlined. Keynes in his trade-cycle analysis will narrow his focus to type (2) investment, goods in process, in a less-than-full employment environment. But he will not clearly distinguish between the long-period fixed capital expectational changes as described earlier and alterations in the level of output due to changes in business confidence; nor will he clearly analyzes their interaction. Perhaps more importantly, he attempts to apply a full-employment savings analysis to a less-than-full employment situation.

Securities, Financial Investment, and Banking

The Treatise's discussion of entrepreneurial investment, savings,

and the market rate takes us into the security market via a component of the savings decision. Keynes introduces the security market by noting that after the consumer's decision between current consumption expenditure and savings, savings requires another decision. The second decision concerns in what form to hold savings or increments to wealth.

In the Treatise, wealth in general, and of course increments to it, can be held either 1) "in the form of money (or the liquid equivalent of money)," "bank deposits," "savings deposits," "inactive deposits," and "hoards" or 2) "securities" and "in other forms of loan or real capital" [Keynes (1930a) pp.xxv-xxvi p.127]. Keynes settles on the terms 'savings deposits' versus 'securities' to describe the storage facilities for both the flows of savings per period and the stock of accumulated savings or wealth. In his 1932 "Prefaces to Foreign Editions" he proposes the terms 'inactive deposits' or 'hoards' to replace 'savings deposits' in distinguishing between 'liquid' and 'non-liquid assets' [Keynes (1930a) pp.XXV-XXVI]. In the original English edition, liquid assets are called 'savings deposits.' The relevant points are two. The analysis of liquid and non-liquid assets proceeds as if whatever is in a category can be considered synonymous or as if they at least index each other. The categories are therefore inclusive, so that real capital is treated like securities while hoards of cash or bank notes used as savings are treated like savings deposits. And importantly, Keynes speaks as if liquid assets remain in the banking system or at least are available for lending. Hoarding is not considered; safety deposit boxes or mattresses stuffed with bank notes, gold coins or bullion are not considered. The decision for the

Keynesian saver is between savings deposits and securities, and if the former is chosen the savings deposits remain with lending institutions, usually the banking system.

Hoarding is not possible in the Treatise because Keynes has assumed away everything but state-reserve managed bank deposits [Keynes (1930a) pp.6-8 p.27]. Keynes outlines three forms of money: commodity, fiat, and managed.

> Commodity money and managed money are alike in that they are related to an objective standard of value. Managed money and fiat money are alike in that they are representative or paper money, having little or no intrinsic value apart from the law or practice of the state....the theory which will be developed in the following chapters is expressed with primary reference to a managed money... Keynes (1930a) pp.7-8.

The Gold Standard Act of 1925 introduced "an objective standard of value" by "law...of the state" [Keynes (1930a) p.7]. As a final simplification, managed money becomes managed bank deposits, so for the sake of discussion

> ...all the current money in the hands of the public is member bank money, i.e. bank deposits. Keynes (1930a) p.27.

All payments are made by check drawn on the accounts of individuals. Keynes, like Wicksell, is working with a pure credit economy tied to an international gold standard. At times Keynes speaks of other forms of financial arrangements, particularly within security markets, but he leaves the details of these arrangements vague [Keynes (1930a) p.225 for example].

The saver's decision of what form that savings flows and the stock of accumulated wealth will take depends on the degree of "bearishness" or "bullishness of the public" [Keynes (1930a) p.128].

> A 'bear'...is one who prefers at the moment to avoid

> securities and lend cash, and correspondingly a 'bull' is one who prefers to hold securities and borrow cash -- the former anticipating that securities will fall in cash value and the latter that they will rise. Keynes (1930a) p.224.

Bears lend to bulls through the banking system. Bears can be made bullish by a sufficient drop in the price of securities and bulls can be made bearish by a sufficient rise in the price of securities [Keynes (1930a) pp.225-226]. Security prices that are thought to have bottomed out or topped out lead to the transformation of sentiments. The prices of new investments, real or financial, follow the price level of securities, while the price level of the securities changes with movements in composition of the stock of wealth. When discussing the entrepreneur's real investment decision, given the natural rate or the state of long-period expectation and savings behavior, the prices of new real investment goods were related inversely to the market rate of interest. What link ties together the bullish (bearish) sentiments, the rise (fall) in the price of investments, and the fall (rise) in the market rate?

If we take the market rate of interest as the "terms of lending" of the banking system, then the price of investment goods (real and financial, new and old) depends on the banking system's reaction to events in the securities market [Keynes (1930a) pp.225-228]. What ignites or dampens the security markets is not made clear until the cyclical theories are addressed; we are here entering the story in progress. Keynes asks us to imagine the total deposits of the banking system, given its reserve creating assets, divided between time and demand deposits or, state alternately, between savings and current deposits. Demand deposits consist of income deposits held by

households and part of business deposits; both are used to circulate essentially currently produced goods and services between consumers and businesses and between businesses and businesses. Savings deposits, along with a second part of business demand deposits, are used to circulate securities and to be held as liquid wealth. The bears through the banking system lend their savings deposits so that the bulls can take a position in securities, while the bears maintain a liquid position. The two uses of deposits Keynes calls 'industrial' and 'financial' circulation [Keynes (1930a) pp.217-224].

Keynes' analysis is a variation on the theory of loanable funds leading toward the theory of liquidity preference. The loanable funds theory is usually presented as the flows of the savings supply against the flow of investment-funds demand, both flows measured in nominal values per unit of time. Keynes wants to bring the existing stocks of securities and savings into the analysis by the introduction of bearish and bullish sentiments toward accumulated savings. In fact he proceeds as if net savings are zero and we are led to focus only on the stock adjustment. This is a consequence of his fixed banking assets assumption, which in turn follows from his interest-inelastic savings behavior and his neglect of nominal savings' dependence on nominal income. It is here where Keynes begins to part company with Wicksell. Wicksell, we saw, clearly shows the dependence of nominal savings on nominal income.

Keynes presents "four possible" combinations of bear-bull positioning in "speculative" markets. M_3 stands for savings deposits in the following quote.

(i) A 'bull' market with a consensus opinion, i.e. security prices rising but insufficiently so that M_3 is falling, and 'bears' are closing their positions on a rising market.

(ii) A 'bull' market with a division of opinion, i.e. security prices rising more than sufficiently so that M_3 is rising, and 'bears' are increasing their positions on a rising market.

(iii) A 'bear' market with a division of opinion, i.e. security prices falling more than sufficiently so that M_3 is falling, and 'bears' are closing their positions on a falling market.

(iv) A 'bear' market with a consensus of opinion, i.e. security prices falling insufficiently so that M_3 is rising, and 'bears' are increasing their positions on a falling market. Keynes (1930a) p.226.

A "consensus of opinion" implies uniform investor sentiments so that in a bull market security prices are expected to continue to rise and in a bear market security prices are expected to continue to fall; in neither market would the opposite price movement be anticipated or the opposite position be developing. On the other hand "a division of opinion" implies that the alternative position is developing in spite of the continued rise or fall in security prices; there is an expectation that the top or the bottom of the market is at hand.

In the speculative market of type (i) we find bears running down their savings deposits or inactive deposits to enter into the securities market, taking positions on a rising market. Keynes claims of business deposits required for financial circulation that

> ...as a result of the great development of devices for economizing the use of cash by stock exchange clearings and the like -- that the absolute amount of the variation in the volume of money so employed cannot ordinarily be very great. Keynes (1930a) p.223.

> ...and also that on account of their [deposits for financial circulation] very high velocity of circulation any necessary increase in them is supplied without much effect on the supply of money for other purposes... Keynes (1930a) p.229.

Once the erstwhile bears use their savings deposits to enter into the market, their buying and selling activities can be sustained with a lower level of business deposits than their initial savings deposits that were used to enter the market. Presumably the now-excess deposits return to the banking system, to be used for other purposes than financial speculation. In effect given the quickness of financial transaction clearing, its high velocity of circulation, it is as if the deposits never left the banking system, but are transformed from savings to demand deposits. Keynes asserts that given "the total assets of the banks,"

> ...speculations of type (i)...have the same effect on industry as an increase in the supply of money... Keynes (1930a) p.226.

With financial circulation taking care of itself, this leaves more funds available for industrial circulation and to a reduction in the market rate. The shift from inactive savings deposits to active demand deposits with fixed assets or reserves leads to a lowered market rate. We will examine this more closely in a moment. Keynes concludes that with a speculation of type (i) occurring, the market price of new real investment goods will be increased from the combined effect of both a rising stock market -- presumably attracting new issues for new real investment -- and lowered terms of lending raising the demand price of new investments. A type (iv) market, a consensus bear market, would "have the same effect as a decrease in the supply of money"; it would increase the terms of lending and discourage new investment [Keynes (1930a) p.226].

To clarify what Keynes is saying here, we can introduce a loaned-up demand deposit multiplier:

$$D = R/(r + r't).$$

Where D represents demand deposits, R the banking system's reserves or assets, r the reserve requirements on demand deposits, r′ the reserve requirements on time or savings deposits, and t the ratio of savings deposits to demand deposits. Keynes elsewhere explains that the then-current English banking convention maintained the same reserve ratio on time and demand deposits [Keynes (1930b) p.11]. Under the English convention r = r′, so the multiplier can be rewritten as

$$D = R/(1 + t)r.$$

A decrease in t with a fall in bearish sentiments raises potential demand deposit creation with a fixed R and a loaned-up banking system. This is rather mechanical and we might ask what is occurring or is tangible to lead bankers to alter their terms of lending.

Keynes states that

> ...all banks use their reserves up to the hilt...they seldom or never maintain idle reserves in excess of what is their conventional or legal proportion....Indeed, why should they, so long as a perfectly liquid asset can be purchased which yields a rate of interest? Keynes (1930b) p.47.

The shift from savings to demand deposits and the latter's high velocity of circulation show up as favorable clearings on interbank check and deposit exchanges. Favorable clearings appear as idle reserves and the bank decision is "in <u>what forms</u> they will lend" them, "not <u>how much</u>" of them to lend [Keynes (1930b) p.59].

> Broadly there are three categories to choose from — (i) bills of exchange and call loans to the money market, (ii) investments [securities], (iii) advances to customers. Keynes (1930b) p.59 my brackets.

The degree of liquidity of these instruments runs from (i) to (iii), from more liquid to less liquid.

Keynes' discussion of banks' loan portfolios suggests that he sees them as either counterbalancing speculative and cyclical activity or feeding it.

> When...they [banks] feel that a speculative movement or a trade boom may be reaching a dangerous phase, they scrutinise more critically the security behind their less liquid assets and try to move...into a more liquid position. When...demands increase for advances from their trade customers of a kind which banks deem to be legitimate and desirable, they do their best to meet these demands by reducing their investments and, perhaps, their bills; whilst, if the demand for advances is falling off, they employ the resources thus released by again increasing their investments. Keynes (1930b) pp.59-60.

The first sentence in the above quote resembles Marshall's description of the behavior of lenders.

> Those whose business it is to lend money are among the first to read the signs of the time; and they begin to think about contracting their loans. Marshall (1923) p.250.

If we think of the banks as "those whose business it is to lend," it appears as if banks could grow generally bearish and through lack of confidence in borrowers refuse to lend at all in the extreme, or remain in a more liquid form until lending in other forms is "legitimate and desirable." This suggests banking as a counterbalance to security-market sentiments, if actions taken by the banking system could be properly timed. Keynes' assumption of an always fully lent banking system does not deny it could anticipate a general lack of confidence; even if there is always some instrument that the banks feel is safe and liquid, government paper for example, banks growing bearish could refuse other forms of lending. Alternately, banks could grow bullish or bearish with general financial market sentiment; that is, they could be swept along with the tide.

It is not clear in either Marshall or Keynes from where the banking

system would derive its foresight to act counter-cyclically. Wicksell suggested using the market rate to stimulate or retard attempted expansion, using changes in the price level as a guide to bank-rate policy. Keynes in the Treatise is an advocate of a banking system that rises above the security market's speculative fray. He is concerned with stock market speculation only in so far as it disrupts the maintenance of the market rate at the level of the natural rate and therefore the equality of the level of investment in real capacity with the level of savings. The market rate is to be pegged, if necessary, to maintain this equality, while adjusting the supply of liquidity through open-market operations to counteract the effects of bullish or bearish financial sentiments on banking's lending ability for industrial purposes [Keynes (1930a) pp.226-230, (1930b) pp.309-315]. Under existing conditions in bearish periods, for example, and since "[a]ny given financial loan is probably more liquid than any given industrial loan," as bank lending is curtailed it will be biased away from industrial circulation, interfering with the appropriate level of investment relative to the growing level of savings [Keynes (1930b) p.311]. In bullish periods, bank lending will be biased toward industrial lending and will add to the growing difference between investment and savings, as savings are falling.

We can begin to see what bearing Keynes' discussion of security-market speculation has on his fundamental equations and the analysis of deflationary and inflationary price-level changes. The market price of investment goods, P', are thought to follow the bear and bull market developments [Keynes (1930a) pp.127-128 pp.226-230]. P' rises on a

bull market, while the flow of savings out of the equilibrium level of savings deposits grows with bullishness and falls with bearishness. A type (i) market, a consensus of bulls, increases "the supply of money for industrial circulation" and allows "increased investment" through a lower market rate and "increase[s] the attractiveness of investment" through a rising securities market [Keynes (1930a) p.226 my brackets]. Increases in P' and potentially C, the level of investment goods, increases $I = P'C$, the market value of investment relative to a slightly falling S, the full-employment income flow of savings. Type (iv) markets, with their consensus of bears, set up the opposite development; the market value of investment goods falls relative to a slightly rising S with a higher market rate and less-attractive investment environment since security prices are falling.

Type (ii) markets, division of opinion bull market, engender simultaneously opposite investment tendencies; rising security prices and the implied fall in the market rate due to the security price rise make investment an interesting consideration, while an increase in the market rate implied by the emerging bear position lowers the demand price of investment. With type (iii) markets, division of opinion bear markets, we again have simultaneously opposite investment tendencies in a lowered security price level with rising interest rates due to the bearishness and a lowered market rate due to the emerging bullishness. Both type (ii) and type (iii) markets lead to an indeterminacy in the interest rate and the rate of investment.[16]

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[16] In a type (iii) market we can think of the emerging bullishness generating an excess supply of money and the bear market as presenting an excess supply of bonds (securities). This is a scenario that

A priori, the net relationship between the market value of investment goods and savings cannot be known in type (ii) and type (iii) markets due to the opposing tendencies on investment. There is, though, a tendency to upset a given equilibrium of zero profits, $Q = I-S = 0$ or $Q_2 = I-I' = 0$, since $I = P'C$. Working through the second fundamental equation we see an inflation or deflation of the overall price level, P", as I>S or S>I, and through our third equation inflationary or deflationary trends in the market price of investments goods, P', as I<I' or I'<I. The price level of consumption goods, P, varies too with the bearish and bullish sentiments, raising and lowering S relative I'. Initially with constant costs (wages, monopoly rents, and entrepreneurial income) I' is fixed, but savings rise in a bear market, generating deflation in P, and savings fall in a bull market, generating inflation in P.

Keynes brings his discussion of the security market to the conclusion

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Patinkin (1958 pp.310-312) states "clearly demonstrates its [liquidity preference's] implausibility" [my brackets].

> For it is difficult to understand why an excess supply of money should drive up the price of bonds even when there exists an excess supply of the latter. Patinkin (1958) p.311.

The liquidity preference theory of the interest rate is presented to imply that an excess supply of money lowers the interest rate and an excess demand raises the interest rate. If we may interpret the discussion in the Treatise of bull and bear markets as embodying the essentials of the General Theory's liquidity preference theory, and, for example, Shackle (1967 p.174 pp.207-215) suggests we can, then it appears that Patinkin's "implausibility" is Keynes' indeterminance. In effect, type (iii) markets, and type (ii) for that matter, are arguing that the liquidity preference schedule is shifting in the same direction as the effective money supply. The latter refers to a relabeling of the horizontal axis of the traditional liquidity preference diagram as the sum of the supply of demand and time deposits.

> ...that changes in the financial situation are capable of causing changes in the value of money in two ways. They have the effect of altering the quantity of money available for the industrial circulation; and they may have the effect of altering the attractiveness of investment. Keynes (1930a) p.227.

Neither the flow of new issue nor the flow of new savings are thought by Keynes to have much or any influence on speculation. Both may be affected and our discussion has pointed to the effect of buoyant security prices on new investment, presumably through their effect on the desire to raise investment funds. Similarly we have mentioned the low interest elasticity of savings; these are new savings flows. Financial market developments acting on the stock of existing savings deposits and the stock of securities swamp the developments in their net flows. Portfolio adjustments between savings deposits and securities driven by speculative markets dominate the net flows of savings and investment.

One of Keynes' contentions in the Treatise is the need for central bank intervention, particularly when indeterminacy arises due to type (ii) and type (iii) markets. The central bank is to peg the market rate at the natural rate through open-market operations, although at times it may be "beyond the wits of man" to determine the appropriate market rate [Keynes (1930a) p.227]. Open-market operations are to supply the deposits for the bear position, to maintain low terms of lending for industrial circulation and avoid deflationary periods and their accompanying decreases in output and employment. Similarly in inflationary periods, or impending inflationary periods, open-market operations should be used to soak up the idle reserves and maintain the terms of lending at the noninflationary natural rate. The central

bank's concern is to maintain the value of new investments equal to the flow of net savings, so that $I = I' = S$, and P', P, and P'' are stable [Keynes (1930a) p.230]. The purpose of open-market operations is not to be motivated by a concern over the price of securities or financial speculation per se, but is to be motivated by a concern to maintain the market rate at the value of the natural rate, maintaining investment at its "natural" level.

Conclusion

This is the first of two chapters on the Treatise; we have used it as an introduction to its theoretical and institutional framework. We again see the importance attached to the quantity theory as an oganizational principle. The fundamental equations were designed to reveal windfall profits and losses. In the next chapter we will analyze in detail the causal mechanism of change initiated by the existence of profits and losses; this mechanism has been presented as lying behind the quantity theory's proportionality between the price level and the money supply.

Our discussion of normal entrepreneurial income in Keynes' definition of earnings, as distinct from any part of windfall profits and losses, led to the conclusion that the Treatise's zero-profit equilibrium condition is in keeping with a stationary-state or steady-state long-period equilibrium. Prices are equal to their cost of production in an economy that parallels that of Marshall. We further saw the problems that this view led to in the Treatise's description of savings, investment, and the natural rate, all defined relative to a long-period equilibrium at full employment. We suggested that this,

in conjunction with Keynes' broad definition of capital and investment, will create problems when Keynes comes to describe trade cycles while using the mechanism, essentially a price mechanism, developed in the long-period context of the quantity theory.

We finally introduced the Treatise's description of financial markets. The bull and bear positioning led Keynes to develop a new role for the interest rate as a mediator between lending activity and security-market activity. The traditional flows of the loanable funds model have been augmented to include stock adjustments. This has led Keynes, particularly in the type (ii) and type (iii) indeterminant markets, to advocate central bank intervention to maintain lending at the natural rate to insure the full-employment level of investment.

We now turn to the Treatise's discussion of monetary cycles, or trend price-level movements, and its discussion of trade cycles, to assess the integration and applicability of the theory we have developed in this chapter.

Chapter Four

A Treatise on Money: Monetary Cycles, Trade Cycles, and the Stability of the Natural Rate

We now have the apparatus at hand to view Keynes' monetary cycle and trade cycle. Broadly speaking and in the context of a closed economy, a context that Keynes does not generally assume, monetary cycles are initiated by 1) alterations in the quantity of money relative to that needed on the economy's growth path, 2) alterations in "the proportions of the total quantity of money" required for financial circulation, and 3) alterations in "the requirements of industrial circulation" due to changes in income or business deposits' velocity of circulation [Keynes (1930a) p.232]. Under 2) comes our recently discussed "changes of financial sentiments," but also "changes...of financial values relatively to the price level of output" [Keynes (1930a) p.232]. The above three causes of disequilibrium Keynes calls 'monetary factors.' His trade cycle or, as he prefers, 'credit cycle' is initiated by

> [a] change in the natural rate, occasioned by a change in the attractiveness of investment or in that of saving, uncompensated by a change in the market rate... Keynes (1930a) p.232 my brackets.

Keynes calls this an 'investment factor,' but does not limit the investment factor to this. Divergence between the natural rate and the market rate "due to a change in the monetary factor" is also classified as an investment factor. One wonders why Keynes made the distinction since the investment factor then overlaps with the monetary factor. In practice it is the former investment factor from which Keynes develops

his credit cycle.

What distinguishes the monetary cycle from the credit or trade cycle is that the monetary cycle traces a disequilibriated economy from one price level to a different one, while the trade cycle traces the disequilibrium movement of the economy from an initial price level back to "an approximately unchanged price level" [Keynes (1930a) p.248]. Between long-period equilibrium paths or positions, where the market rate differs from the natural rate and the quantity equation as a long-period equilibrium condition does not hold, Keynes is considering short-period disequilibrium dynamics [Keynes (1930a) p.145, (1930b) p.141]. Although our discussion of the long-period equilibrium described in the Treatise was not conclusive in all of its details, we are safe to interpret the Treatise's short-period disequilibrium analysis, at least in the case of monetary cycles, as the macroeconomic equivalent to the Principles' long-period analysis though potentially viewed from the perspective of a growing economy. The credit cycle with its emphasis on "goods in process" will raise questions of its position relative to the long-period framework. It is precisely these questions we wish to exploit to demonstrate the anomalous nature of the trade cycle; that anomalous nature led to its reconsideration in the General Theory. From either the monetary cycle's or the credit cycle's perspective, Keynes reasons, though, that there is no economy-wide short-period equilibrium within the Treatise's quantity-theory framework.

The distinction that Keynes is drawing between a monetary cycle and a trade cycle -- due to the market rate varying relative to a fixed

natural rate in the former and the natural rate varying relative to the market rate in the latter -- contrasts with Wicksell's position. We saw that Wicksell did not draw this distinction, but thought the cycles similar enough not to need distinguishing. His theory of crises or of short-period price-level movements, though not developed at length, was presented as distinct from either of Keynes' distinctions, the two of which constituted Wicksell's theory of secular price-level development. We have noted, and will be developed in detail, that the Treatise does not use a change in the natural rate in its explanation of the credit cycle to imply an investment cycle in plant and equipment, a type (1) fixed capital cycle, but uses a change in the natural rate to set off a type (2), circulating capital, cycle. Keynes has limited the impact of a change in the natural rate so that he can speak of crisis situations. This seems an artificial restraint. In spite of these differences it is clear from Chapter Thirty of the Treatise, titled "Historical Illustrations," that Keynes and Wicksell are attempting to explain the same or similar historical incidences of trend price-level movements and short-term periods of crises.

Keynes, as we have just noted, presents his monetary cycle as a separate species of cycle from his credit cycle. But he adds a disclaimer, that

> ...they are independent in the sense that their effects are superposable, the effect of one aggravating or counterbalancing the effect of another. Keynes (1930a) p.233.

We will see that there are aspects of the credit cycle, particularly when security market and financial speculation alter the natural rate, which should be expected under both cyclical scenarios. Alteration of

the natural rate is overlooked in Keynes' presentation of the monetary cycle, but its event would convert the monetary cycle into a credit cycle according to his investment factor. This is at least one case where the cycles "can tend to produce one another" [Keynes (1930a) p.233]. We will take the cycles one at a time, touching on the possibility of a changing natural rate as a consequence of a monetary factor, but leaving the full discussion until the trade cycle is developed. The monetary cycle will be presented first and then we will take up the trade cycle.

The Monetary Cycle

A monetary cycle initiated by one of the three monetary factors listed earlier resolves itself into an increase or decrease in the quantity of money in the banking system [Keynes (1930a) p.235]. The terms of lending will ease or stiffen, respectively, as banks find themselves with increased or decreased reserves. Keynes pursues the case of increased reserves and a lowered market rate. Their effects are 1) they increase the demand price for investment goods and "stimulate the production of capital goods," effects which are compounded if security prices rise simultaneously with the "cheaper money," 2) if there exist an "unsatisfied fringe" of entrepreneurs and an "unemployed fringe of the factors of production," their employment and output will increase, and 3) some entrepreneurs will "foresee profits" from the increased quantity of money and will willingly pay factors more to increase output [Keynes (1930a) p.236].

Savings out of increased remuneration per unit of factor employment and out of an increased level of money income is ignored and

not considered as a possible offset to the rise in both the market value of investment goods, I, and the cost of production of investment goods, I', with effects 1) through 3) of increased reserves. Keynes' comment on savings looks only at the changed market rate.

> There is...a general presumption that the effect on saving, if any, will be opposite in direction to the effect on investment, the...less satisfactory terms to lenders [savers]... Keynes (1930a) p.237 my brackets.

Although Keynes notes the possible variation in output, employment, and workers' pay, in the determination of the level of savings, income is ignored and implicitly savings is assumed to be at the full-employment output level.

Keynes suggests that we should initially ignore the rise in earnings, the rate of earnings, and possibly employment; E/O is "unaltered" in the beginning of the cyclical upturn [Keynes (1930a) p.237]. He argues that in "the primary phase" an increase in the price level occurs due to the second terms of the last two fundamental equations, since I>I' and I>S [Keynes (1930a) p.238]. This effect Keynes has earlier described as profit inflation [Keynes (1930a) p.140]. By assumption, income inflation, a change in the first term of the fundamental equations, does not occur at this stage. Presumably with no expansion in employment and output, and no change in earnings, I' remains constant after the increase in banking reserves, and at least initially the inequalities arise from an increased investment-goods demand price and their market value, I. With an increased demand price for investment goods, entrepreneurs would find their expected normal remuneration to be exceeded. As in Wicksell there is an ex post "surprise" in the form of Keynes' windfall profits as entrepreneurs

attempt to expand capacity. The windfall is acquired by the producers of investment goods through a market value above the costs of production of investment goods; profits in investment goods equals I-I'.

Wicksell relied on the immediate running-up of the wage bill to bring about the ex post windfall. The interest component of output costs had fallen and so total cost would remain constant with an increased wage bill without affecting the expected normal level of entrepreneurial profits or income. Keynes comments on Wicksell's reasoning without mentioning him or making it central to his monetary cycle.

> Since the rate of remuneration to the factor capital is less than before, owning to the fall in the rate of interest, the above [hiring factors at an assumed fixed remuneration] is compatible with...[a rate] <u>increase</u> (but probably only a small one) to the other factors of production. Keynes (1930a) p.236 fn.1 my brackets.

Keynes can forgo the rising wage bill and utilize the rising demand price of investment goods to generate the effect of ex post profits. To the extent that Keynes downplays changes in wages and thinks of savings as both interest inelastic and at a full-employment level, then the windfall profits arise from I>I' and I>S. I>I' is simply a rise in the demand price or market price of investment goods relative to their cost of production, capital inflation, and I>S is a rise in the demand price of the fixed amount of investment goods relative to the level of savings.

Further, to the extent that Keynes downplays changes in wages, he minimizes the diffusion of profits through the sectors from investment-goods production to consumption-goods production [Keynes (1930a)

p.237]. I>I′ and I>S represent profits to the capital-goods sector and aggregate profits respectively; I′>S is required for consumption-goods sector profits. As it stands with earnings initially held constant, I′=S and a profit spillover from investment goods to consumption goods does not occur. The profit spillover we have seen is one aspect of Wicksell's price-level transmission mechanism. Keynes states:

> ...I shall sometimes ignore the distinction between the purchasing power of money [P] and the price level of output as a whole [P"], and the extra complication due to the fact that I and I′ are not necessarily equal. But where the essence of the argument is affected, I shall, of course, draw attention to this. Keynes (1930a) p.237 fn.1 my brackets.

In fact Keynes chooses to emphasize, when he allows a rise in earnings, the price level of consumption goods, P, rising through E in the first term of the first fundamental equation, and not through consumption-goods sector profits [Keynes (1930a) p.237]. A little later he suggests that entrepreneurs will switch to investment-good production and away from consumption-good production due to the former's profitability, as if profits have not arisen in consumption-good production [Keynes (1930a) p.240]. But that may arise simply because Keynes neglects having removed, in this stage in his argument, his simplifying initial assumption of fixed earnings.

The ex post realization of windfall profits initiates a "secondary phase" as firms increase their wage offers and so begin to increase the first term of the fundamental equations, while the cost of production of investment goods, I′, also increases [Keynes (1930a) p.238]. An increase in the first term of the fundamental equations Keynes calls "income inflation" [Keynes (1930a) p.140]. Filling in "the essence of the argument," the increase in the cost of investment goods, I′, upsets

the second term of the first fundamental equation, I'>S, and adds profit inflation in the form of commodity inflation to income inflation, driving up the price level of consumption goods, P [Keynes (1930a) p.237]. The increases in both the consumption-goods price level and the investment-goods price level leads to a greater demand for banking deposits for industrial circulation, and transforms the banking system's unused or excess reserves into required reserves to back the deposit expansion [Keynes (1930a) pp.238-239].

Keynes' argument will lead him to an all-around increase in the price levels equal to the enhanced first terms of the fundamental equations, where the second terms all go to zero, as they were prior to the monetary disturbance [Keynes (1930a) pp.241-242]. In the process, security prices also rise, so that in total the demand for industrial and financial circulation requires the banking system to reassess its lowered terms of lending along the way to the higher price levels. As long as the second term of the fundamental equations shows a positive imbalance -- as long as the market rate is less than the natural rate-- "entrepreneurs are enjoying windfall profits...[and] the position is unstable" [Keynes (1930a) p.241 my brackets]. The excess reserves find their way into circulation, encouraged by the reduced market rate, and raise prices along the way. The rising prices require a greater amount of deposits to circulate the initial or increased amount of goods, services, and securities, and when the banks return to their rationing of credit and raise the market rate the "unsatisfied fringe of would-be entrepreneurs" and "unemployed fringe of the factors of production" will presumably find themselves unemployed again and the amount of

goods and services will return to their initial levels [Keynes (1930a) p.236 p.242].[1]

The secondary phase not only increases wages and the cost of production, but the securities market is also infected with rising prices. A bull market develops as the lowered market rate represents a cheaper source of funds for "speculators and financiers" [Keynes (1930a) p.239]. Keynes presents two scenarios following from the effect of rising security prices. First, through "the new-issue market," windfall profits

> ...will reach the hands of entrepreneurs for the purpose of increasing, or endeavoring to increase, the output of investments. Keynes (1930a) p.239.

This leads to further encouragement of investment and further increases in the price of investment goods. This is an indirect effect of a lowered market rate operating through the financial markets to spur attempts at extending real investment. Second, Keynes considers

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[1] Dimand (1988) writes:

> The Treatise...lacked a mechanism for bringing cumulative inflation or deflation to a halt at an equilibrium price level, unless the monetary authority happened to set the market rate of interest equal to the natural rate. Dimand (1988 p.188) my underlining.

and

> If the banking system does not set the appropriate interest rate, there is no force in this model [of the Treatise's monetary cycle] which would restore equilibrium. Dimand (1988 p.40) my brackets.

The process may not work "smoothly," but it is precisely the absorption of excess reserves into demand and savings deposits relative to those needed along the growth path or in a stationary state that "force" the banking system to adjust its terms of lending and stabilize the price levels [Keynes (1930a pp.241-242]. We did see in the last chapter Keynes advocating central bank intervention in the cases where security-market stock adjustments led to indeterminacy of the interest rate; at this stage in his argument these consideratiions are not being addressed, although they would give force to Dimand's argument [Keynes (1930a pp.226-230].

shifting bear and bull sentiments and falls back on rising bear savings deposits relative to demand deposits to diminish the banking system's lending ability. At some stage after an initial bull market, bear sentiments develop in anticipation of falling security prices. Some part of the banking system's excess reserves become the backing of the growing savings deposits of the bear position's portfolio stock adjustments [Keynes (1930a) pp.239-240].

The increased deposits required for both industrial and financial circulation will absorb the excess reserves through the rising price levels of investment goods, consumption goods, and securities, the rising rates of remuneration, and the increased bear position [Keynes (1930a) p.240]. Borrowing for real investment does not absorb the reserves, since

> ...the excess loans will be balanced by the accrual of profits at the end of each production period and will, therefore, be again available...for the next production period... Keynes (1930a) p.242.

Keynes has the banking system's growing reserve constraint lead to increases in the terms of lending, returning them to their initial position as excess reserves are utilized in circulating goods and services at higher prices and rates of remuneration. The initiating monetary disturbance divorced the market rate from the natural rate; and price adjustments, in a full-employment or near full-employment economy, are required to restore the former to the latter, to restore the quantity-equation equilibrium.

At the quantity-equation equilibrium $I'=I=S$, all three must be at a new higher level due to the higher rates of remuneration and the higher cost of production. That is not like Wicksell, who relies on something

of a real balance effect to bring the savings flow into line with the investment flow. Keynes is not at all clear what mechanism brings this about, or even that he notices it. The interest rate is a likely candidate, but we are told that savings has an inelastic interest-rate response, so the interest rate/savings relationship is not enough in itself. Had Keynes allowed the flow of savings to rise with the level of nominal income, then movement toward his equilibrium would be obtained. Here we would arrive at a Wicksell-like move toward an equality between ex ante investment and ex post savings; the excess investment raises nominal income and therefore nominal savings. But the cause of inflationary (or deflationary) tendencies would remain as the market rate differed from the natural rate. The increases in prices and rates of remuneration, the increase in the demand for industrial deposits, must increase the market rate sufficiently to cut off the excess investment relative to savings and balance bull/bear sentiments. Such a balance of sentiments is important since a consensus bull market arising from a lowered market rate is equivalent to an increase in the supply of money; this added supply of money in conjunction with the initiating increase in the money supply must be absorbed in either industrial or financial circulation to restore the market rate to the natural rate. A continued imbalance between bears and bulls would imply either, in the case of bull sentiments, a rise in the money supply or, in the case of bear sentiment, a fall in the money supply -- and inflationary or deflationary impulses from the security market alone. It would appear that price-level stability ultimately is dependent on the appropriate balance between bear and bull investors'

expectations of future security prices and their expectations of future interest-rate movements. The security-market expectational balance must react to the augmentation in the market rate due to industrial and/or financial deposit demand so that the market rate of interest returns to the level of the natural rate of interest, which is defined by technological knowledge, market saturation, and resource supplies.

Keynes' discussion of the adjustments in the disequilibrium phase does not lead him to anticipate that they will evolve "smoothly" [Keynes (1930a) p.242]. In a deflation due to reduced banking reserves the rate of earnings must evidently be reduced to restore normal remuneration to entrepreneurs, but

> ...the factors of production may resist the fall, with the result that their period of unemployment may be prolonged. Keynes (1930a) p.242.

Relative earnings will also vary, affecting factors "in the weakest bargaining position or [who] have the shortest contracts" [Keynes (1930a) p.243 my brackets]. These two points are equally true in an inflation and by implication, Keynes is arguing that labor attempts to maintain its existing wage differentials, a theme which is repeated in the General Theory [Keynes (1936) p.14]. Further, Keynes considers excessive investment relative to savings even "after what should be a sufficient alteration of M_1V_1 [= earnings] has taken place," leading to prices higher "than can be permanently sustained" [Keynes (1930a) p.242 my brackets]. Keynes gives no explanation, but he discusses it much later when considering the 1929 Wall Street crash, of a bullishness that is undampened by a market-rate increase and how this could supply added pressure on the price level of investment goods,

provided rising security prices drag the market price of investment goods with them as he contends [Keynes (1930b) pp.174-175]. This suggests again the precariousness of price-level stability based on the proper balance of bull and bear sentiments.

The problems raised by deflation are not discussed in the same detail as the problems raised by inflation. We might wonder if there is an asymmetry in the deflationary process due to a decrease in the money supply relative to the inflationary process just considered. Keynes allows for the development of unemployment in a deflation much more clearly then he allows increased employment in an inflation, though he does not fill out the story nor draw what now would be considered important consequences [Keynes (1930a) p.242]. With the development of unemployment and corporate losses it seems much less reasonable to maintain the full-employment rate of savings [Keynes (1930a) p.242]. In the inflation scenario we have seen there are problems with the latter. A decrease in the money supply increases the market rate and decreases the demand price and the cost of production of the level of investment. Keynes places his emphasis on reductions in factor remunerations to eliminate windfall losses and unemployment, bringing the cost of production into line with sales revenues [Keynes 1930a) pp.241-242]. Even with initially fixed remuneration to factors, the cost of production of the level of investment goods, I', will fall since the volume of investment goods demanded falls with the increased market rate. Reduced production will lead to reduced employment and income in investment-goods production, which we would suspect, in turn, will spill over into consumption-goods production, reducing employment

and income further. Again this transmission of losses from investment-good production to consumption-good production is overlooked. Keynes' point is that the ensuing profit and income deflation will reduce the demand for circulating deposits, and so will reduce the market rate toward the fixed natural rate and restore full-employment output. But profit and income deflation would also reduce the level of savings and we might suppose the "attractiveness of investment" [Keynes (1930a) p.138] and so by the latter reduce the natural rate itself.[2] As Keynes has it, both the natural rate and full-employment savings act as long-period determinants independent of cyclical events; they are centers of gravity or, to borrow from Smith's natural price, they are the valuables toward which the cyclically affected variables "are continually gravitating" [Smith (1776) p.58]. More on this in a

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[2] Elsewhere Keynes addresses some of these issues, but presents them as noncentral to his argument; they are a issues raised "in passing."

> When for any reason an entrepreneur feels discouraged about the prospects, one or both of two courses may be open to him -- he can reduce his output or he can reduce his costs by lowering his offers to the factors of production. Neither course, if adopted by entrepreneurs as a whole, will relieve in the least their losses as a whole, except in so far as they have the indirect effect of reducing savings or of allowing (or causing) the banking system to relax the terms of credit and so increase investment (neither of which is what the entrepreneurs themselves have in mind); whilst, on the other hand, both courses are likely to aggravate their losses by reducing the cost of investment. Keynes (1930a) p.144.

Had these points been made central in the deflationary process, its mechanism would have been made clearer. The drop in savings and earnings given fixed banking reserves would lead toward a lowered market rate equating it with a given natural rate, and restoring full-employment investment. The natural rate is left untouched in the passage even though "prospects" are reduced, unless we can interpret the long parenthetical phrase as somehow implying its change. If the latter is the case, then the level of operation of the economy and its equilibrium are open questions. We will return to this question after our discussion of the trade cycle.

moment.

In summary and comparison, before we move on to Keynes' trade cycle we note the following. The investment/savings relationship and sectoral transmission are overlooked, or are certainly not emphasized in the Treatise's monetary cycle. Like Wicksell (1898) and Marshall (1923) the center of gravity is the natural rate or the long-period equilibrium interest rate. We have also raised the question of the stability of the natural rate itself, particularly in the context of profit and income deflation. In the name of symmetry we might raise the same question in the context of profit and income inflation. A similar set of questions were raised in the context of Marshall's and Wicksell's speculative market crises. Raising questions about the stability of the natural rate undermines the pillar on which Marshall and Wicksell based their theories, and at least one of the pillars on which Keynes built the Treatise's theory. We are questioning the process by which long-period full-employment equilibrium is established. A corollary question is of the existence of a short-period less-than-full employment equilibrium defined by a cyclically determined natural rate or state of long-term investment expectations. Given the importance attached to the market rate in motivating the level of investment in Marshall, Wicksell, and the Treatise, the corollary equilibrium's existence hinges on the market rate not only altering the demand price of investment goods through its discounting function, but also indirectly altering the prospective income streams of investment, which are a component defining the natural rate, through its effect on employment, output, and earnings. Further, the market

rate must realign the bear and bull sentiments, instituting a new market rate where financial market balance is reached, but also fulfilling the zero profit condition. These discussions are vital on our way to the General Theory. We shall see that the Treatise's trade cycle is presented as a less-than-full employment equilibrium, and as such it raises a question of the meaning to attach to the Treatise's conceptual components. These questions point us toward the General Theory, but their answers are incomplete in the context of the Treatise.

The Trade Cycle

Keynes' trade cycle, or "credit cycle" as he prefers to call it, resembles "the swing of the pendulum"

> ...because an excess movement in one direction tends to bring into operation not only its own remedy but a stimulus to an excess movement in the other direction... Keynes (1930a) pp.249-250.

The movement is set off by entrepreneurs anticipating profitable new outlets for expanded production and investment; the relevant passages we have touched on earlier [Keynes (1930a) p.248 p.254 p.258 p.271, (1930b) pp.86-87]. The initiating factor is not the ex post realization of abnormal profits as in the monetary cycle; it is a change in the natural rate [Keynes (1930a) pp.232-233].[3] The credit

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[3] The sustained discussion of the trade cycle initiated by a change in the natural rate is inconsistent with a passing comment made earlier by Keynes in the Treatise.

> Booms and slumps are simply the expression of the results of an oscillation of the terms of credit about their equilibrium position. Keynes (1930a) p.165.

The "equilibrium position" we have stated reflects a given natural rate. We will find the terms of lending varying with a change in the natural rate; Keynes may intend the above oscillations in the terms to be seen as induced by the altered natural rate, but from the context it

cycle's route follows the upswing of the price levels through their down-swing around "approximately unchanged price level[s]". [Keynes (1930a) p.248 my brackets]. Keynes precisely defines the credit cycle to be

> ...the alternations of excess and defect in the cost of investment over the volume of savings and the accompanying seesaw in the purchasing power of money... Keynes (1930a) p.249.

The purchasing power of money means the power to buy goods and services "for the purposes of consumption" [Keynes (1930a) p.48] and so refers us to the first fundamental equation for the price level of consumption goods. The Treatise's credit cycle defines itself eventually around I'<S or I'>S, a change in the cost of investment goods relative to the level of savings regardless of the initiating sector.

Keynes' analysis of the trade cycle focuses on changes in working capital or, as he wrote in an earlier draft of the Treatise, "goods in process, that is in the course of production" [CWJMK Vol.XIII p.19].

> Many writers on the credit cycle have emphasised the irregularity of the rate of investment in fixed capital as being the major cause of the disturbance. If we have in mind initiating causes this is probably true. But the most characteristic secondary phase of the credit cycle is due to the growth of investment in working capital. Keynes (1930a) p.252.

A change in the natural rate is the "initiating" factor, but the discussion is of the "secondary" output level adjustments. In fact Keynes' analysis loses sight of the prime cause in the sense of fixed capital investment, which we earlier identified with long-period investment expectations. One way to understand the process that the

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is not clear.

Treatise is attempting to describe is through the theory of effective demand. The "initiating" rise in fixed-capital investment, due to a change in "psychological causes" or "a new technical discovery," raises the level of effective demand. The credit cycle then describes this cause's effect on output and employment; this is the General Theory's explanation of the Treatise's mechanism and it is done from theoretical hindsight [Keynes (1930a) p.254, (1936) pp.77-78].

The Treatise goes on to speak of the expansion of output and its eventual contraction as generating the windfall profits and losses independently of an initiating fixed-capital alteration. In effect the desire to expand output in "particular directions" represents a change in the natural rate due to renewed business confidence [Keynes (1930a) p.254 p.258]. The change in the natural rate in this case leads to an altering of type (2) investment, goods in process; the idea of investment has been narrowed to one of its components. We are then discussing a short-period disequilibrium process in Marshall's sense of the terms; output adjusts to new expected demand conditions given a fixed capacity. But the given capacity is hidden behind a short-period term of production. Keynes' language is even a bit confused; he goes on to speak of a primary phase, a secondary phase, and a collapse. The primary phase becomes the change of goods in process sparked by renewed business confidence, not an increase in demand for type (1) investment-good producers' supplies [Keynes (1930a) p.254]. Keynes develops the trade cycle so that I' rises due to type (2) investment.

Keynes explains that we are proceeding from an equilibrium position in a depression; from the perspective of the Treatise this is a long-

period equilibrium as Keynes has defined the term. He writes that he is describing:

> ....a recovery in the volume of employment from a preceding slump which has reached an equilibrium between prices and costs of production, but is still characterised by unemployment. Keynes (1930a) p.274.

We will see below that unemployment is not always assumed to describe the initial conditions of the trade cycle, but from the perspective of our discussion of the General Theory in the next chapter, the cases with unemployment are the important ones. The purpose of his description of the trade cycle is to present a representative pattern of it and explain how the equilibrium comes into existence. One explanation that could be brought forward, but is not, is that the underemployment equilibrium has come about through an inappropriate, but stable, interest rate. The interest rate is maintained through one of the indeterminant security-market types; that is, the market rate is lodged at a higher rate than the full-employment natural rate [Keynes (1930a) p.226]. In this we would enter the realm of liquidity preference. The Treatise does not rely on this to establish the initial equilibrium, nor does it rely on the multiplier process when it turns to an explanation of the adjustment to equilibrium. Although there is a process described where the increase in working-capital investment in the investment-goods sector increases the demand for consumption goods, this intersectorial transmission mechanism is not consistently applied.

We have a unemployment situation where $I'=S$; consumption-good producers still in business are making a normal income, since $I'=S$ implies that windfall profits or losses in the consumption-goods sector

are zero. We have a less-than-full employment equilibrium, where I'=I; that is, investment-good producers still in business are making a normal income also. 'Normal' income arises because of the definition of earnings presented in the Treatise and because of the zero windfall profits or losses Keynes has asserted define the slump equilibrium. Clearly there has been some shift in the definitional underpinnings of the fundamental equations. We would not expect "normal" earnings to be made in a less-than-full employment situation with excess capacity on hand. We would expect firms to be covering their average variable costs, and perhaps some of their costs associated with capital, but we would not expect them to be making a return that would leave them content with the "bargains" they made with all factors of production [Keynes (1930a) p.112]. Earlier, purchasing-power stability, the zero-profits condition, was defined at full employment [Keynes (1930a) p.132 p.137]. We see immediately that difficulties arise as Keynes attempts to use a framework built around stationary-state or steady-state assumptions to solely describe variations in goods in process or in the level of output and employment.

What forces would be operating to lead to I'>S, or I>I', in a less-than-full employment economy? The latter is Keynes' original initiating factor. Again a rise in the market value of investment goods depends on the relation between industrial circulation's needs relative to financial circulation's, as well as the banking system's lending policy in a slump, and investment goods' demand, given excess capacity. Should the market value of investment goods rise, there is no need for the upturn in business confidence, since realized sales

will exceed expectations. At the outset of a trade cycle requiring and responding to a change in business confidence we have I=I'=S and a less-than-full employment equilibrium. In the Treatise's alternative terminology the market rate is equal to a less-than-full employment natural rate. Keynes states at one point that a "cheap money" policy will drive I to exceed I' and initiate the adjustment in output or goods in process that characterizes the trade cycle [Keynes (1930a) p.254]. Elsewhere he asserts a "lending policy" that only influences investment in goods in process [Keynes (1930a) p.274]. In another passage it is argued that the monetary ramifications of a return of business confidence will be induced by the return of confidence itself [Keynes (1930a) pp.256-257]. Again it is unclear from where the process of the trade cycle begins, but the analysis that follows focuses on goods in process.

The disequilibrium movements of Keynes' analysis focus mainly on price-level movements, though he is considering periods of slumps and booms and their attendant alterations in employment and output. Keynes presents three stylized types of credit cycles, of which he claims no completeness as a catalogue, but does state that they are the "leading openings" [Keynes (1930a) p.253]. To the modern reader they appear to be contrived to force price-level movements and vitalize the quantity equation. Considering "the case where investment is increasing relatively to savings," Keynes' three cases are as follows [Keynes (1930a) p.252]. Case (i) has capital-goods production substituting for consumption-goods production "without any change in the total volume of output". Case (ii) has an increase in the production of capital goods

"superimposed on the existing output", that is, an increase in total output. Case (iii) has an increase in the production of consumption goods "superimposed" on the level of total output [Keynes (1930a) pp.252-253]. In case (ii) and case (iii) it is assumed "that the factors of production are not fully employed" and attempted expansion leads to actual expansion [Keynes (1930a) pp.255-256]. The initial investment is an investment in working capital. These three cases constitute the "primary phase" of the credit cycle initiated by the perception of profit opportunities [Keynes (1930a) p.254]. We might ask why case (ii) and case (iii) do not occur simultaneously, providing for the possibility of even or uneven growth? It is because that would impede the price-level changes that Keynes seeks. Keynes suggests that there are "numerous" and "varieties of paths" the credit cycle can take, but they all resolve themselves into case (iii); it is

> ...the most characteristic of a credit cycle, because...all...tend to end up...with an admixture of this type. Keynes (1930a) p.253.

We will focus on case (ii) and case (iii) due to their less-than-full employment assumption. In both cases, before consumption goods come to market, when they are still in their period of production, the price level of consumption goods rises due to a rise in the level of earnings, in turn due to output expansion. What is important about the expansion of consumer goods is that after their period of production is completed and they come to market, they begin the process of deflation which tends to undermine their profitability and lead us back into a down-turn.

As stated, Keynes lays out the particulars of the credit cycle in

three phases: the primary phase, the secondary phase, and the collapse. The three cases outlined above are only kept distinct during the primary phase and blend into case (iii) -- increased consumption-good production -- in the secondary phase. We turn now to the details of the three cyclical cases.

In case (i) the primary phase finds entrepreneurs substituting capital-goods production for consumption-goods production; entrepreneurs expect I to exceed I'. The level of total output and employment is held constant at full employment. Keynes utilizes a period-of-production model to claim that the effect on consumption-good prices will not be felt until the production process time interval has passed. During the period, "the output of available goods is...as before" and the level of earnings is as before; it is only after the consumption goods' period of production has passed, when fewer consumption goods arrive on the market while earnings are constant, that the consumption-goods price levels rise [Keynes (1930a) pp.254-255].

> The upward-price phase of the credit cycle will have made its appearance. Keynes (1930a) p.254.

Keynes characterizes the commodity price-level change as commodity inflation which, as we have seen, he defined as an increase in $Q_1 = I'-S$ in the first fundamental equation. In fact what he has described is an increase in $(I'-S)/R$, the second term of the first fundamental equation, due to both a decrease in R, the volume of consumption goods, and an increase, due to the higher volume, in the cost of production of the level of investment goods relative to the level of savings.

As a further qualification, Keynes allows for the possibility that

case (i) will lead to an increase in earnings through a rise in the rate of earnings as entrepreneurs in capital-goods production attract new hands to themselves and away from consumption-good entrepreneurs [Keynes (1930a) p.255]. In case (i) and unlike cases (ii) and (iii) there is no role for the unemployed, whose employment would have the effect of raising total earnings without the need to raise the rate of earnings. The rise in earnings during the period of production leads to income inflation immediately as earnings have risen while the available level of consumption goods is unchanged. Income inflation only adds to the eventual commodity inflation. "[T]he consumption price level must rise more than earnings" due to the second term in the first fundamental equation [Keynes (1930a) p.255]. With or without this qualification the anticipated profits in investment-goods production has lead to an unanticipated realization of profits in consumption-goods production. We have in Keynes' credit cycle a clear sectoral profit transmission mechanism.

Case (ii) in the primary phase presents an increase in total output through an increase in capital-goods production. Keynes characterizes this as "the more usual" case and

> assumes...that the factors of production are not fully employed at the moment when the cycle begins its upward course... Keynes (1930a) p.255.

The increase in investment first manifests itself as an increase in working capital or "goods in process", and therefore in the cost of production of investment goods, Keynes' I'. The increase in I' is simultaneously an increase in the investment-good sector's earnings bill "without...any increase in available output" of consumption goods

[Keynes (1930a) p.256]. "Available output" is a term Keynes has defined earlier to mean consumption goods on the market [Keynes (1930a) p.114]. Consumption-good prices rise due to an increase in I' above S and due to an increase in E above 0 in the first fundamental equation, or E_r above R in Harrod's formulation. Again the pursuit of expected profit opportunities in investment-goods production, the expectation that I will exceed I', has led to unexpected profits in consumption-goods production; profit expectations are transmitted between sectors. Consumption goods are sold at prices higher than anticipated when the consumption-good production period was begun.

Rewriting Harrod's formulation of the first fundamental equation as $PR=E_r+E_c-S$ -- that, is consumption goods' sales revenues equal what is spent on them -- then alternately $PR-E_r=I'-S$ since $E_c=I'$. Profits (equal to sales minus costs) rise with an increase in earnings in investment-good production, and since R is fixed by the period of production, the initial rise in profits emerges through a rise in P. The increase in I' Keynes assumes is "not balanced by additional savings" [Keynes (1930a) p.255]. We might expect some new savings out of increased earnings, at least to partially offset the increase in working capital, but Keynes never brings forward the idea of savings as a function of income, real or nominal, to balance the investment/earnings swings.

Case (iii) mimics case (ii) in the primary phase except that the growth in working capital, goods in process, arises not from expansion of investment goods, but from the expansion of "particular categories of consumption goods" [Keynes (1930a) p.256]. The earnings bill

immediately increases, pushing up the price level of consumption goods produced in the previous period, and consumption-good producers realize profits. Keynes abruptly asserts that after the augmented level of consumption goods' period of production currently under way is completed, the commodity price level falls to its "previous level," since the consumption-good output level on the market has been augmented by "the same amount as earnings have been augmented" [Keynes (1930a) p.256]. Keynes is arguing as if he assumes the marginal propensity to consume is one; he does not claim that demand for consumption goods is augmented by the proportion of consumption expenditures to increased earnings.

This would require a concurrent increase in the production and employment in investment goods to generate an incremental demand above that consumed out of consumption-goods earnings. The price level of consumption goods would stabilize; but without an increase in the market value of investment goods, I, to match the increase in I' and S, the price level of investment goods would fall and so would the overall price level. In effect, investment demand must drive the system for the consumption-good producers' expectations to be realized. Keynes is close to the concept himself, but fails to bring its implication forward. He writes in another context that

> ...the proportion of total output which shall be available [the consumption-goods proportion] has been determined unequivocally by the amount of investment which the entrepreneurs have decided to make. Keynes (1930a) p.155 my brackets.

And further he states:

> If...investment has taken place <u>pari passu</u> with saving, the equilibrium of consumers' expenditure and producers' available output will remain at the pre-existing price level. Keynes

(1930a) p.157.

But the savings mentioned here are not arising out of a trade-cycle induced change in earnings, as the unitary marginal propensity to consume in that context attests; they arise secularly along the growth path through a "steady process" [Keynes (1930a) p.251] With a marginal propensity to consume of one his deflation then occurs. We have a difficulty in comprehending the mechanics of the third case, as well, as we again see difficulties emerging around the role of savings and income.

Keynes has case (i) and case (ii) convert to case (iii) and its deflation; this is pivotal to his explanation of the down-turn. The deflation in consumption-goods production becomes an earmark of the tertiary phase of all cases. Unlike case (i) and case (ii), in case (iii) anticipated profits do not spread to the other sector as realized profits. If they did, earnings would rise and so the demand for consumption goods would rise, sustaining the higher consumption-good price level. Investment is occurring in case (iii); it is investment in working capital, goods in process, but Keynes overlooks its repercussions on the investment-goods sector. In case (i) with no mention of unemployment, the investment response in consumption-good manufacturing to abnormal profit spillover from capital-goods production does not on the face of it rule out some feedback from consumption-goods production to capital-good manufacturing and the possibility of sustaining the boom and justifying entrepreneurs in the capital-goods sector initiating optimistic sentiments. In general the mechanism of the trade cycle, the causality, is confused; it appears to

have been designed to lead to the price-level changes emphasized by the quantity equation tradition.

The primary phase further implies certain monetary conditions or alterations, so that the enhanced level of circulation can transpire within a fully loaned-up banking system. We have mentioned this earlier, and here will just look at the induced factors. Keynes lists several factors that facilitate increased industrial circulation. The industrial boom may be accompanied by a security-market boom; the reduced bear position decreases the needs for financial circulation and releases funds for industrial circulation [Keynes (1930a) p.256]. Or a slight increase in the market rate may be sufficient in releasing funds

> ...either by increasing the velocities of circulation as a result of the enhanced cost of maintaining balances...or...by attracting gold from abroad. Keynes (1930a) pp.256-257.

Case (i) would require the smallest change in the monetary environment since it largely consists of transferring currently utilized goods and factors to the capital-goods producing sector. Note that the security-market boom could start or enhance a type (1) investment boom in any of the three cases as the market value of investment goods or their volume are swept along with security prices, since higher security prices reduce the cost of raising funds for investment purposes. Keynes overlooks this possibility and again overlooks its possible inhibition of case (iii)'s deflation.

The secondary phase is ushered in by the realization of unanticipated profits in the consumption-goods sector regardless of the initiating sector. Consumption goods sell for more than they cost, where costs include normal entrepreneurial remuneration. Windfall

profits

> ...act as an inducement to retailers and wholesalers to reduce their stocks.... But the almost inevitable result of profit on current output and the visible depletion of stocks is to encourage manufacturers of consumption goods to strain their efforts to increase their output... Keynes (1930a) p.258.

As Keynes explains later, entrepreneurs are myopic in allowing current prices or "spot price" to motivate output decisions. This is due to the "uncertain" nature of future prices, prices at the end of the production period, "which ought to influence them" [Keynes (1930a) p.292]. The rush to production increases the employment offered, increasing even more the earnings level and, if they have not already increased, the rate of earnings. Full employment at least of "certain...specialized factors of production" is being reached [Keynes (1930a) p.259]. The secondary phase also brings pressure on banking reserve assets as the price level rises due to income and commodity inflation [Keynes (1930a) p.259]. This tends to increase the terms of lending. Keynes is setting the stage for the collapse of the business upswing through his anticipation of deflation in the consumption-goods price level and his anticipation of increases in the market rate.

The collapse does not necessarily bring windfall losses and a slump. The secondary phase, regardless of its initiating cause, brings an increase in consumption-goods output and sales, and

> ...entrepreneurs can always sell consumption goods for an aggregate sum which is at least equal to their cost of production... Keynes (1930a) p.260.

The assumption is that the marginal propensity to consume is one. With zero profits in consumption-goods production, $I'-S=0$ and $PR=E_r+E_c-S$ equals $PR=E_r$ since $E_c=I'$. The price level of consumption goods may

fall to "the previously ruling price" and "the boom may just cease" [Keynes (1930a) p.260]. Windfall profits in consumption-good production are only sustainable as earnings race ahead of consumption-good production; as the product comes to market in greater volume, the windfalls dissipate, particularly when the level of investment is not sustained. As we remarked earlier this sequential mechanism is not at all clear in the Treatise, which says that

> ...the incentive to an increased output of capital goods should diminish, just as the incentive to the production of consumption goods increases. Keynes (1930a) p.259

Are we back to thinking of fixed-capital investment as an initiating cause, not working capital, which the rising market rate is bringing down? A post-boom augmented price level will be maintained, not at the highest level obtained "in so far as income inflation has occurred" [Keynes (1930a) pp.259-260]. We have a partial deflation. These statements Keynes makes conditional on working-capital investment of case (i) and case (ii) having run its course, or $I'-S = 0$.

Keynes is less than clear on the scenario leading to the end of the boom and further to the end of the boom without a following slump. The rise in the consumption-good price level, initially attributable to commodity inflation or windfall profits, is passed on in a general rise in the rate of remuneration or income inflation.

> ...[T]he potentialities of the factors of expansion will become exhausted...the windfall profits of entrepreneurs will be continuously stimulating them to bid against one another for the services of the factors of production, so that the profit inflation will gradually pass over into income inflation and...more and more money will be required for the support of the industrial circulation. Keynes (1930a) p.261 my brackets.

In cases (ii) and (iii) full employment has been reached due to the

response of producers to higher prices and profits. This sequence, Keynes suggest, will occur within a period or two [Keynes (1930a) p.256 p.259 p.273]. Keynes' income inflation implies that the cost of production of investment goods, I', is higher due to the higher remunerations. Where do the higher savings come from to balance against the higher I' to stabilize the price level? Keynes speaks as if the marginal propensity to consume is one; more reasonably, we are left with higher nominal savings out of higher nominal income.

Perhaps Keynes does not dwell on these details because he anticipates that the deflation in the consumption-goods price level that does occur

> ...is likely to usher in, not merely the end of windfall profits, but the beginning of windfall losses. Keynes (1930a) p.260.

Keynes foresees several consequences of the partial commodity deflation. Marginal producers will be put out of business, reducing both the total output level and the working capital level. The commodity deflation again "may change financial sentiments" to the bear position; and this combined with the enhanced needs of industrial circulation may force the banking system to raise the market rate above the natural rate [Keynes (1930a) p.260].

> A point will come...when the effort to expand or to maintain the volume of industrial circulation will drive the effective bank rate to a level which is...[a] deterrent to new investment relatively to saving. At this point the slump sets in. Keynes (1930a) p.261 my brackets.

Keynes is relying on an overreaction of bearish sentiment in the fine balance between bulls and bears that in better circumstances would maintain the market rate at the natural rate, in conjunction with the

enhanced needs of industrial circulation, to drive the market rate above the natural rate. Capital deflation or losses are generated by the excess bearishness; the market price of investment goods, P', and their market value, I, fall with the drop in security prices, but this time they fall below savings.

Quite simply the drop in new investment due to the fall in marginal producers, the rise in the market rate, and the capital deflation due to the security market slump, leads to a situation where $I'<S$ and $I<S$. A general deflationary environment has developed requiring either the prolonged process of income deflation, i.e. wage reductions, to lower the price level and relieve the banking system as in the monetary cycle, a turnabout in stock-market sentiments or

> ...a new invention, or the development of a new country, or a war, or a return of "business confidence" as the result of many small influences tending the same way. Keynes (1930a) p.271.

Invention, international develcpment, and war all represent a rise in the natural rate.

As the above two quotes indicate we are back to considering the market-rate/fixed-capital investment relationship as the prime cause or "initiating" factor behind the trade cycle. In a similar vein Keynes writes:

> With the progress of income inflation the surplus bank resources which gave the stimulus to entrepreneurs to extend their activities fade away (because of the increasing demands of industrial circulation)... Keynes (1930a) p.259 my underlining.

Keynes has failed to make clear the connection between fixed-capital investment, an increase in the demand price of investment goods, and output adjustment. The culprit appears to be his initial broad

definition of investment which when used generally blurs the distinction between fixed capital and working capital. Without a distinction for analytical purposes there is no need to establish a connection.

With a given level of fixed-capital investment, type (i) investment, Keynes relies on consumption-good deflation, the end of windfall profits, an increase in earnings, and the change to bearish sentiments to "usher in" the deflationary slump. The first and last are crucial in the development of the slump as opposed to a leveling off of prices at a new higher, but stable level. We might ask to what extent is Keynes led to his conclusions by his apparent assumption of a unitary marginal propensity to consume, or by his not considering an increase in savings with income, real or nominal? To the extent that the level of savings increases with income and these increases flow into the financial markets, the net savings flow could supply the funds necessary to support the new level of investment. This parallels a point of view which began to arise out of the Cambridge Circus' critique of the Treatise's discussion of savings, and helped move Keynes toward the General Theory.[4] But with fixed reserves, the mechanism of savings must take a different form.

We have seen that Keynes' banking system operates with fixed potential reserve assets. The last quote points in this direction, although it does seem to contradict his assumption of a fully lent banking system when he speaks of "surplus bank resources." An increase in savings deposits, either real or nominal, would utilize these

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[4] See Robinson (1933) for example.

assets or resources through the established reserve-ratio conventions on deposits, unless the savings themselves were in the form of gold or gold-convertible substitutes and were added to banking assets. Ignoring the gold flows in a pure checking economy, we could argue that the other side of increased industrial circulation is simply an increased level of savings out of the increased level of earnings. The increased savings level in turn puts pressure on the terms of lending as the stock of savings deposits supported by the fixed reserve assets grows, except insofar as they are converted into financial circulation in a bull market. In that case their high velocity of circulation could reverse any pressure on the terms of lending that might come from increased industrial circulation. The ratio of time deposits to demand deposits, t, in the demand-deposit multiplier would fall, increasing the banking system's lending ability, or at least stabilizing it. As Keynes has stated, the savings decision is both a choice not to consume and a choice of what form in which to hold one's wealth, although it is not a decision to invest in real capital since savings and investing are done by different groups [Keynes (1930a) p.127 pp.157-158 p.250].[5] Could not the flow of savings into financial markets support the increased investment either through bank lending or through new security issues in a buoyant market? Allowing net savings increases leaves open the question of whether they are sufficient to match the investment flow and a bearish desire for savings deposits. Bearishness could independently drive up the market rate, a precursor to the

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[5] That argument was carried over into the General Theory see Keynes (1936 pp.210-212 p.63) for example.

General Theory's liquidity preference, but here Keynes has tied the outbreak of bearishness to the deflation in the consumption-good price level.

What of the consumption-good deflation brought on by the consumption goods coming to market in the secondary phase? Here the culprit is the period-of-production analysis used by Keynes. The price rise occurs before and during the period of consumption-good production, before the goods come to market. Why could not these goods come to market with the growth of demand? Ignoring the atypical full-employment case (i), in cases (ii) and (iii) we start from slump conditions which would be consistent with abnormal inventories[6], as well as the idle plant and equipment and idle hands that Keynes has pointed out. Keynes' "goods in process" notion of investment implies excess capacity and short-period output adjustment. Increased demand for capital goods, either of Keynes' type (2) sort or of the plant and equipment type (1) sort, may initiate the boom, but consumption goods will surely quickly follow, first, from inventories which Keynes thinks are minimal and second, from increased production. The requirement for any price increase, let alone a price rise shortly followed by a price decline, is minimized as long as idle hands and factories exist. Keynes' use of a period-of-production analysis contrives the cycle's development so that goods are not initially available as demand is

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[6] Keynes (1930b pp.116-124) in fact argues that the stock of liquid capital, goods available immediately, will fluctuate very little in the "short-period" of the credit cycle. Abnormal inventories will generally not exist. Dimand (1988 pp.34-36) notices the same point and at times argues that consumption-good output is "perishable" in the Treatise; the latter seems an overstatement.

growing, and then they are overabundant.

In our modified model, without price increases or decreases, the expectation of advantageous investment avenues may suggest abnormal profits, but abnormal profits would not be necessary to maintain production as long as expected sales are matched by actual sales and entrepreneurs receive a remuneration sufficient to cover some fixed costs. What factors would now contribute to the end of the boom? Keynes suggest one determinant that is independent of the deflation; the initial advantageous profit opportunities "will wear themselves out with time" [Keynes (1930a) p.273]. This is a lowering of the natural rate which implies a time perspective longer than the usual short-period perspective of the trade cycle. An alternate dampening effect would occur when nominal income increases and causes increased demand for industrial circulation. Should this exceed the banking system's ability to accommodate it through the savings/financial market nexus, the market rate would rise. Independent of a change in the natural rate, the dampening effect would occur through this and any outbreak of bearishness, given investment's sensitivity to the market rate.

A change in the natural rate due to the wearing out of investment opportunities relies on a conception of the natural rate that entails long-period investment sentiments; this is the conception of the natural rate which we discussed earlier and introduced as Keynes' primary idea of it. A change in the natural rate really implies a reconfiguration of the economy to a new stationary-state or steady-state equilibrium. This was most clearly seen in our discussion of Wicksell. In terms of the Principles it means a secular change which

induces a new stationary long-period equilibrium. Keynes' use of a change in the natural rate in the trade-cycle setting now appears to imply movement along an aggregate investment demand schedule, instead of movement of the schedule itself. It is in the latter sense that Keynes was using it when he initiated his trade cycle; at least, this is the General Theory's sense of the argument [Keynes (1936) pp.77-78]. We can obviously have an initial shift in the aggregate investment demand schedule and then movement along it, but the direction of movement along it would depend on how savings behavior is modeled in consequence of the changed investment and how willingly the banking system supplies credit. These questions are not adequately addressed by the Treatise; it leaves us in something of a muddle. At minimum in the trade cycle we have a level of investment senitment, or of the natural rate, insufficient to maintain full-employment output or income.

In the trade-cycle theory, with its emphasis on the period of production and short-period capacity adjustment, the natural rate has clearly come unmoored from its long-period stationary- or steady-state framework. In cases (ii) and (iii), with their initial less-than-full employment equilibrium, Keynes effectively reduces the natural rate to motivating a circulating capital period of production. He has undermined its long-period usefulness in denoting an extension of Marshall's monetary framework. The period of consumption-goods production comes to dominate the time sense of the trade-cycle model; it is inherently short-period in nature in the sense of adjusting output to demand conditions given fixed plant and equipment. Yet the

focus of the adjustment is on price-level adjustment, and we again see the shadow of the quantity theory of money.

The Collapse of the Natural Rate

Keynes in the Treatise generally wants the natural rate to anchor cyclical adjustments. The trade-cycle discussion suggests that the natural rate has some vapor-like qualities when tied to business confidence. And there are yet two other loose ends. First, at times, in contexts other than the trade cycle, the natural rate is presented as dependent on the market rate, destroying the stability of the environment in which the monetary cycle is active. Alternately stated, the current cyclical market developments can alter the state of long-term expectations. Second, the time framework of the Treatise's dynamic analysis raises questions of where the General Theory's short-period equilibrium would be situated in such a context. In the interpretation of the Treatise's trade cycle already we see Keynes moving toward the General Theory's framework, even if inadvertently.

As we have argued, the Treatise's natural rate parallels Money, Credit, and Commerce's long-period stationary equilibrium interest rate. Savings is relatively interest-inelastic and implicitly is held at its full-employment level in Keynes' monetary cycle discussion, although Keynes allows it to grow secularly in a steady-state sense. Speaking of British savings behavior, he places the level of savings at "some 10 percent of our income" [Keynes (1930b) p.168]. In his discussion of the trade cycle the role of savings is again overlooked, and becomes more confused as he attempts to apply his full-employment monetary analysis to a less-than-full employment economy. As we have

pointed out, in the trade cycle he ignores the implied short-period variation in the level of savings with the level of income. The factors affecting investment expectations have been enumerated several times earlier: technological advance, population growth, development of new countries and markets, war, and business confidence. Except for business confidence, Keynes presents investment expectations as if they are stable at any moment; and they define, in part, his long-period equilibrium.

There are passages, though, where the natural rate deviates from its "normal level" due to adjustments or overadjustments in the market rate [Keynes (1930a) pp.184-185]. In his discussion of the "'Modus Operandi' of the Bank Rate," Chapter Thirteen, set initially in the context of a given natural rate, a monetary factor causes the market rate to rise above the fixed natural rate. This is the monetary-cycle context. We are told that the "primary effect" will be a fall in P', the market price of new investment goods, and a rise in the level of savings; "the former is more likely to be quantitatively important than the latter" [Keynes (1930a) p.183]. The rise in savings leads to a fall in P, the price level of consumption goods, while simultaneous with this fall in P there is a drop in the output of investment goods due to their lowered demand price. These Keynes calls a "secondary effect" [Keynes (1930a) p.183]. "[T]ertiary effects" occur in consequence of losses made by "all classes of entrepreneurs" unless the "bank rate is reversed" [Keynes (1930a) p.184]. The tertiary effect is conditional on the banking system's responsiveness, particularly its responsiveness to a decrease in the demand for deposits due to a fall

in industrial circulation. In the tertiary phase, output and employment continue to fall and grow worse "the longer the state of affairs continues" [Keynes (1930a) p.185]. We are told:

> There is also one more aggravation. So long as there is a prospect of losses, the natural rate of interest will fall below its normal level, thus widening the gap between the natural rate and the market rate, and requiring a reduction of the latter perhaps beyond what is practicable. Keynes (1930a) p.185.

Keynes has allowed the natural rate to drift from its mooring on full-employment productivity and thrift, although he qualifies the above by claiming it will stay fast if entrepreneurs expect "the period of loss will be fairly short", for example if they expect the banking system to reverse itself [Keynes (1930a) p.185]. The entrepreneurial price myopia mentioned earlier now appears to be abandoned [Keynes (1930a) p.292]; price expectations now include or are dependent on expected macroeconomic developments, and are not described by simple price-taking behavior. Keynes has introduced a less-than-full employment natural rate separate from the real factors of productivity and thrift, and exclusively dependent on entrepreneurial expectations. As mentioned earlier, Keynes stated the "different types of disturbance...tend to produce one another"; here the monetary cycle has generated aspects of the trade cycle [Keynes (1930a) p.233].

Keynes gives us an historical example of his analysis in a discussion of the 1929 Wall Street crash and the slump that ensued. According to Keynes the slump was brought on by the Federal Reserve System's attempt to reign in the speculative stock market with a high market-rate policy prior to the collapse. The policy spread internationally as "a sympathetic self-protection," presumably

protection of central bank reserves [Keynes (1930b) p.176]. These rates reduced new investment internationally, representing a "prelude [to] an era of falling prices and business losses everywhere" [Keynes (1930b) p.176 my brackets]. The stock-market collapse itself simply brought the bear and bull views toward equilibrium; "the two parties could agree with one another more nearly" [Keynes (1930b) p.175]. But the collapse "aggravated" the investment slump on its arrival

> ...both by discouraging investment and by encouraging savings. The pessimism and atmosphere of disappointment which the stock-market collapse engendered reduced enterprise and lowered the natural rate of interest; whilst the 'psychological' poverty which the collapse of paper values brought with it probably increased savings. Keynes (1930b) p.176 my underlining.

We might add that the banking-policy confusion following the collapse and the budget-balancing attempts further lowered entrepreneurial expectations.

In another passage on the relationship between the natural rate and the market rate Keynes states that

> ...if [the] bank rate falls, this tends to raise the natural rate, if it arouses expectations of a tendency toward rising prices, thus increasing the attractiveness of investment in terms of money. Keynes (1930a) p.189 my brackets.

In general we can conclude that there are passages where the natural rate is dependent on the market rate and through price-level and output changes, actual or expected, the prospective yields on investment projects alter and therefore the investment-demand schedule will shift in certain circumstances with changes in the market rate. The circumstances are largely determined by entrepreneurs' expectations of future bank-rate policy.

In Keynes' analysis of the monetary cycle the final emphasis,

particularly when considering deflations required for balance-of-trade adjustments, is on the "prolonged" process of earnings-rate adjustment [Keynes (1930a) p.242]. Keynes relies on earnings-rate changes or income inflation and deflation to reduce the distance between the market rate and the natural rate [Keynes (1930a) pp.242-246]. Since unlike "[i]n Bolshevist Russia or in fascist Italy it" is not "possible by decree to change the money rate of efficiency earnings overnight," the policy instrument available to make the earnings adjustment is the bank rate itself [Keynes (1930a) pp.244-245]. An increase in the market rate eventually lowers the money rate of earnings; a decrease in the market rate eventually raises the money rate of earnings. As Keynes suggests, there is an asymmetry in this adjustment process.[7]

> If it is a case of reducing the rate of earnings, the factor of production may resist the fall, with the result that their period of unemployment may be prolonged. Keynes (1930a) p.242.

We can assume factors do not resist earnings increases. An inverse dependence of the natural rate on the market rate introduces a new factor into whatever earnings-adjustment process is necessary.

We might ask to what extent a drop in the market rate would be sufficient to raise the natural rate in the depressed conditions required to reduce earnings? How farsighted are Keynes' entrepreneurs? At times he has them operate with a current sales-price myopia reacting to ex post realized sales, with a market-rate inelastic natural rate. At other times, as just noted, they react to monetary or bank-rate policy "if it arouses expectations...of rising prices" [Keynes (1930a) p.189]. The extent to which the natural rate varies with the market

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[7] Also see Keynes (1930a pp.151-153).

rate is an open question. Would we suspect the inverse relationship is symmetrical, operating in both slumps and booms with the same intensity? It is clear that the natural rate could lose its anchoring status, its attribute as a center of gravity, and could throw the adjustment process into disarray.

The disarray could be further compounded by changes in nominal earnings and their effects on the level of demand. We have mentioned several times that Keynes does not expect the earnings-adjustment process to proceed "smoothly," due to labor's resistance to wage cuts [Keynes (1930a) p.242]. He also states that he does not want to develop in detail the "intricate theory of the economics of the short-period" [Keynes (1930a) p.145]. But as we have also quoted before, he tells us "in passing" that,

> When for any reason an entrepreneur feels discouraged about the prospects, one or both of two courses may be open to him -- he can reduce his output or he can reduce his costs by lowering his offers to the factors of production. Neither course, if adopted by entrepreneurs as a whole, will relieve in the least their losses as a whole, except in so far as they have the indirect effect of reducing savings or of allowing (or causing) the banking system to relax the terms of credit and so increase investment (neither of which is what the entrepreneurs themselves have in mind); whilst, on the other hand, both courses are likely to aggravate their losses by reducing the cost of investment. Keynes (1930a) p.144.

Reductions in employment and wages only lead to losses and "are likely to aggravate" the situation. A reduction in the cost of investment represents a drop in nominal earnings and a drop in nominal demand. It is presumed that firms are having difficulties selling at their current prices; a reduction in demand only causes a further reduction in prices and revenues, moving firms into deeper losses as their costs do not fall as fast as their prices and revenues. This description of a

process which can be envisioned to have been set in motion by deflationary monetary policy does not lead to a vision of investment decisions and investment expectations as stable in the face of short-period cyclical developments. Having tied the natural rate to entrepreneurial price expectations which change with changes in the market rate of interest, it would would seem appropriate, given the above passage, to tie these same price expectations, and therefore the natural rate, to changes in earnings and output.

Keynes' trade or credit cycle is introduced by shifts in the natural rate, which appear simply to mean changes in the level of investment. Investments rise relative to savings, requiring an increase in earnings to bring the market rate into line with the new higher level of the natural rate and stabilize the investment/savings relationship. In this characterization, it is assumed that the consumption-goods deflation, the rise of bearishness, and the reduction in marginal producers are not such to stimulate a cyclical down-turn. On the face of it, the inverse relationship between the market rate and the natural rate would be stabilizing; a rise in the market rate lowers the natural rate and brings the investment/savings relationship into line earlier; by Keynes' definition this is an equilibrium position. In Keynes' typical case (ii) and (iii) trade cycles we start from a position of unemployed resources with an increase in the natural rate, the market rate rises after or near full employment due to a rise in remuneration and a rise in bearish sentiments with the deflation of consumption goods. Does this rise in the market rate jar the natural rate downward, setting up a cyclical down-turn, which in turn leads to

a fall in the market rate and new rise in the natural rate? A cyclical or oscillating dynamic around full employment is possible if we know nothing about the convergence of the market rate/natural rate relationship. Given the natural rate's expectational qualities, is it possible for them to converge at less than full employment? We are suggesting, at least, one rationale for the Treatise's underemployment equilibrium, if not the cyclical pattern of the trade cycle itself.

Finally we can address the question of the General Theory's less-than-full employment short-period equilibrium or at least its time frame versus the time frame of the Treatise. The monetary cycle is dominated by full-employment investment in plant and equipment and, conceivably, with net investment balanced by net savings in equilibrium, the Treatise is presenting an equilibrium growth path. A stationary state is equally possible without net investment nor net savings. Out-of-equilibrium periods describe inflationary or deflationary episodes where the growth path or the stationary state is exceeded or its potential is not reached. The equilibrium stationary state can be thought of as a realization in a particular short-period of full employment with price stability. When looked at from the Principles' perspective on the short-period, where output adjusts to demand, given capacity, it so happens in the monetary-cycle case that the level of capacity utilization and the earnings it generates leads to no further desired adjustments in capacity. The long-period equilibrium is just a special short-period equilibrium; the monetary cycle's equilibrium represents a long-period equilibrium from the point of view of the representative firm or industry. The equilibrium

stationary state then corresponds in an analytical temporal sense with the General Theory's short-period unemployment equilibrium only insofar as the output level chosen has adjusted to the level of demand, but a short-period equilibrium implies nothing about the desired level of capacity that the General Theory's firms would prefer.

We saw in the last section a wobbly, if inadvertent, step toward the General Theory when we discovered that the trade cycles' adjustments were of output to capacity. This was implied by the "goods in process" notion of investment or the investment in current output that Keynes was discussing. The level of savings, of investment, and of the market rate, which defined the initial conditions of the trade cycle, Keynes defined as a less-than-full employment equilibrium. In the output adjustment context of the trade cycle this implies a less-than-full employment short-period equilibrium where entrepreneurs are realizing their expected proceeds, but not receiving their long-period normal rate of return. There is a shift in the meanings of Keynes' fundamental equations, their definition of earnings, and the natural rate, which Keynes in the Treatise does not seem to notice; we now have a less-than-full employment natural rate.

But it is unclear what behavioral interpretation to give to the new natural rate. In the case of the monetary cycle, a lowering of the market rate below the natural rate caused the realization of excess profits by raising the market value of investment goods above their cost of production, which led, in turn, to raised expectations of further profits. The drop in the market rate raised the level of nominal investments under full-employment conditions. In the trade

cycle we have a similar process, except the natural rate is no longer defined relative to a full-employment economy, and a change in the market rate does not necessarily lead to to type (1) investment in plant and equipment, but can simply raise type (2) investment in goods in process.

In the long-period stationary-state context of the monetary cycle at equilibrium, the natural rate sets a uniform rate of profit throughout the economy, allowance being made for the 'representative' nature of this conceptualization. But in the disequilibrium phase, individual or 'representative' industry profit rates can differ from the natural rate, presumably in different manners depending on the techniques of production and variations in product demand. At this stage each firm's or industry's expected profitability would vary, and the natural rate loses its behavioral significance. The economy's convergence back to the full-employment natural rate is really a matter of faith in the smooth working of market signals, as counter-exemplified by wage and output cuts generating losses in the "intricate...short-period" [Keynes (1930a) p.145]. Clearly then, the natural rate in the short-period of the trade cycle, or the monetary cycle for that matter, simply signifies the expected profitability of individual firms or industries given their current economic circumstances and the state of the economy. If their individual sales proceeds meet their expectations they will have no incentive to change their behavior except insofar as past investment decisions affect desired current output levels and investment decisions, or if the economic circumstances change. A change in economic circumstances

leads to a change in their "natural" rate or broadly defined investment behavior.

We have just seen in our discussion of a cyclically dependent natural rate three factors that signal to firms or industries that circumstances have changed: a change in the market rate, a change in nominal wages, and a change in output. Each of these Keynes in the Treatise identifies with changes in prospective prices or revenues due to a change in the level of demand. Keynes never links in a consistent or precise manner changes in the level of investment with changes in demand or output. Changes in the natural rate which come about with changes in the market rate point in this direction. But his discussion of the third phase of his trade cycle, where working-capital investment in consumption-goods production is seen to strictly increase wages in consumption-goods production with no increase in employment in working-capital production, points away from the investment/output connection.

Conclusion

We have presented Keynes' monetary theory of price-level trends, or monetary cycles, and demonstrated the central importance of the natural rate in determining the outcome of a monetary disturbance. It is in this context that we first raised the question of the stability of the natural rate, particularly in the context of income and profit deflation. In general, though, our presentation simply demonstrated the integration of the Treatise's components, highlighting the price-level adjustment and market-rate adjustment. We noted the requirement of a balance between bearish and bullish security-market sentiments, as

well as the requirement of a balance between investment and savings. The discussion of savings, as we stated in Chapter Three, was insufficient; it does not mention the dependence of nominal savings on nominal income, a requirement of his equilibrium and the restoration of the market rate to the natural rate. Perhaps he thought it too obvious to mention.

In our discussion of the trade cycle, we discovered that Keynes wants to speak of a less-than-full employment equilibrium, but apparently maintains the framework and concepts, at least the terminology, developed for the analysis of long-period full-employment price-level movements. We made use of our extended discussion of the trade cycle to emphasize the shifts in meaning of some key ideas found in the Treatise's framework, particularly the idea of normal entrepreneurial income and the natural rate. The less-than-full employment equilibrium caused us to rethink both concepts. The natural rate, or its change, came to signify simply a change in the expected prospects from investment either in plant and equipment or in an increased scale of output. The natural rate lost its connection to a full-employment stationary- or steady-state economy. The income enjoyed by entrepreneurs in the underemployment equilibrium with excess capacity we identified with the income obtained when realized sales or prices meet entrepreneurial expectations, as in the Principles' notion of a short-period equilibrium when output is adjusted to the level of demand, given fixed capacity. Our main justification for drawing this parallel is the emphasis Keynes placed on a firm's goods-in-process decision. This, of course, leaves vague the influence of investment in

plant and equipment on the equilibrium process. We found, in fact, a great muddle when we addressed the trade cycle's handling of the latter type of investment. Finally throughout our discussion of the trade cycle we noted Keynes' contrivances to force price-level adjustments and validate the quantity theory, doing this in a model which we found invalidated the long-period framework customary to the "classical" monetary tradition.

In the discussion of the collaspe of the natural rate we used Keynes' asides on the possibility of a cyclically dependent natural rate to raise the question of what factors determine the firms' expected level of demand, and how the natural rate and the market rate might converge in a less-than-full employment economy. This led us to compare the setting of the Treatise's adjustment process to that of the General Theory's. We drew again on the Principles' analysis of the long-period and the short-period to draw a parallel between the trade-cycle analysis and the short-period analysis of the General Theory, but we found the parallel to be incomplete. Keynes never links changes in his cyclically dependent natural rate -- his change in investment sentiments -- in a consistent way with changes in the level of income or output. Our discussion of the cyclically dependent natural rate and the determinants of demand raised questions of the viability of the natural rate, as a uniform rate of profit, having any behavioral determining role in restoring the economy to equilibrium.

As a final conjecture, it needs to be said that it is the quantity equation and Keynes' acceptance of it as a full-employment equilibrium condition that underlies the time frame of the Treatise. It colors his

explanations of price-level dynamics and focuses his attention on them. Price levels are to be explained at the expense of a sound theory of output movements and savings behavior. In the trade cycle, consumption-goods production cannot expand with the expansion in demand for such goods; a period-of-production analysis focuses attention on price-level changes. In the trade cycle, full employment is quickly reached, forcing market-rate changes; and in the monetary cycle, the full-employment level of savings and bear's savings positions force market-rate changes. Both cases are seen to initiate price-level changes. The consequences of the asides on a cyclically dependent natural rate are not explored, leaving open questions of where the economic system is grounded. Is it grounded in the potential full-employment levels of productivity and thrift or in entrepreneurial expectations of prices, revenues, and demand? The assumption of full employment or a system that quickly restores full employment is an assumption that facilitates price-level changes and hides a view that sees the world through the quantity equation.

Chapter Five

The General Theory's Criticisms of 'Classical' Monetary Theory

As early as the autumn of 1929, Pigou's comments on the Treatise asked why the bank rate "cannot affect E or O," earnings or total output, and Pigou asked "What happens if O alters...?" [CWJMK Vol.29 p.5]. The Treatise was published in October 1930; several months before its publication Hawtrey commented on what must be Keynes' first fundamental equation, "Mr. Keynes's formula," that it

> ...does not recognise the possibility of a reduction of output being caused directly by a contraction of demand without an intervening fall of price. CWJMK Vol.XIII p.152.

Hawtrey gives an example where with an increase in the level of savings, traders "curtail orders" to avoid "an accumulation of unsold stocks" of consumer goods without an initial price reduction. Output falls and with it "consumer's income," and Hawtrey remarks that the latter "could not fail to cause some falling off of savings" [CWJMK Vol.XIII pp.151-152].[1] Hawtrey goes on to suggest that savings and investment, the latter including the "unsold stocks," may come to equality at a level of output lower than initially supposed.

Keynes responded to Hawtrey a month after the Treatise was published, stating that alterations in the level of output due to actual or anticipated price changes are "important, but not strictly a monetary problem" [CWJMK Vol.XIII p.145]. The Treatise considered "what governs prices," but even here it did not consider "every

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[1] Hawtrey's remarks were later published in Hawtrey (1932 pp.336-338) and eventually were addressed by Keynes (1936 p.51 fn.1) in his discussion of short-term entrepreneurial expectations.

conceivable factor" that would be required for "a complete picture" [CWJMK Vol.XIII p.145]. Alteration in the level of output, which, like Marshall, the Treatise makes a special case and the object of its trade-cycle theory, both Pigou and Hawtrey suggest is the general case. A complete theory of price-level dynamics requires that alterations in output and income are not addressed as secondary issues. They are suggesting, without elaborating or investigating the consequences, that in changed conditions of credit or with a changed propensity to save, alterations in output can be anticipated and must be made part of the theory. Keynes continues his reply to Hawtrey:

> ...I am not dealing with the complete set of causes which determine volume of output. For this would have led me [on] an endlessly long journey into the theory of short-period supply and a long way from monetary theory; -- though I agree that it will probably be difficult in the future to prevent monetary theory and the theory of short-period supply from running together. ...
>
> As it is I have gone no further than that anticipated windfall loss or profit affects the output of entrepreneurs and their offers to the factors of production; but I have left on one side the question how much output is affected and also whether output can be affected in any other way. CWJMK Vol.XIII pp.145-146 my brackets.

But we must remember that in the Treatise Keynes is operating from a full-employment equilibrium condition at least in his monetary cycle [Keynes (1930a) p.132]. So windfall profits generate price-level increases, not changes in output, income or employment; and windfall losses are reasoned to affect the latter only insofar as prices, particularly wages, are not downwardly flexible [Keynes (1930a) pp.242-244]. In the case of the trade cycle where underemployment is permitted, we found contrivence abounded when a change in output was integrated into the Treatise's theory. The above quote has a slightly

false ring to it. But Keynes appears to be suggesting that output must be significantly affected before it interferes with the process he has described in his monetary cycle or the process operative due to a trade-cycle imbalance in I=I'=S. He does not address the relationship between output, income, and savings.

Robinson (1933a) points to the Treatise's banana-plantation parable as a demonstration by Keynes of the possibility of multiple positions of investment/savings equality, and therefore of underemployment equilibria; Robinson says that Keynes "completely overlooks" "the significance of this discovery" [Robinson (1933a) p.25]. In his parable Keynes has us imagine a closed nation of banana producers, where initially bananas are priced at their cost of production with savings equal to investment. Keynes argues that the institution of a "thrift campaign," an increase in what we would now call the propensity to save, without a compensating increase in investment in new plantations leads to a fall in the price of bananas and brings losses to the producers [Keynes (1930a) pp.158-159]. As a consequence, producers reduce their employment levels or reduce their wages. This does not restore profit levels, but reduces the aggregate "spending power of the public...as much as the aggregate costs of production" and perpetuates the losses [Keynes (1930a) p.160]. Keynes concludes:

> Thus there will be no position of equilibrium until either (a) all production ceases and the entire population starves to death; or (b) the thrift campaign is called off or peters out as a result of the growing poverty; or (c) investment is stimulated by some means or another so that its cost no longer lags behind the rate of savings. Keynes (1933a) p.160

It is perhaps the second of these which suggests to Robinson a relationship between savings and income, and that changes in income

will drive the level of savings to whatever the level of investment happens to be.

Robinson concludes from Keynes' parable that

> ...he has proved that output may be in equilibrium at any number of different levels, and that while there is a natural tendency towards equilibrium between savings and investment (in a very long run) there is no natural tendency towards full employment of the factors of production....He failed to notice that he had incidentally evolved a new theory of the long-period analysis of output. Robinson (1933a) p.25

Robinson later stated that the idea of an underemployment equilibrium "came out from the discussions at the time of the Circus," that is, 1930-1931 [Lambert (1969) p.253]. She is perhaps reading the underemployment equilibrium into Keynes' parable from the hindsight of those discussions. A change in the level of output is not necessarily stated by Keynes; entrepreneurs reduce employment or wages, and either will drive down aggregate expenditures. But more importantly, in the context of the Treatise the decrease in the price level of bananas and the decrease in wages or employment will reduce the demand for industrial circulation and will reduce the bank rate. Or should bearishness have arisen, decreased industrial circulation will tend to reduce the bank rate against the bearish tendencies to increase it. Keynes would be content to analyze a change in savings behavior along the lines of his trade cycle, as he suggests can be done [Keynes (1930a) p.257]. Keynes does not introduce the banking system or the state of security-market sentiments into his parable, but given the thrust of the Treatise's analysis and its reliance on the bank rate as a full-employment equilibriating factor, then one of the "some means or another" by which "investment is stimulated" is the bank rate. The

Treatise's major discussion of the bank rate occurs in the chapter which immediately follows the chapter containing the above parable.

The historical transition from the Treatise to The General Theory has been analyzed at length, for example by Patinkin (1976 and 1977), Milgate (1983), Kahn (1984), Bridel (1987), and Dimand (1988). The multiplier and the theory of effective demand are identified as of central importance in this development, along with a new central and emphasized role for expectations. Yet one important aspect of the conceptual transition does not appear to be fully appreciated. We have argued in earlier chapters that the quantity equation dominated the analytical structures of the arguments of Marshall, Wicksell, and the early Keynes' monetary theories. In particular it motivated the definitions of the stationary-state or steady-state long-period equilibrium. Fundamental to the occurrence of the long-period equilibrium is the flexibility of both the wage rate and the interest rate. It has been argued that when the question of changes in the level of output has been raised in these earlier works' discussions of the trade cycle, their focus on price-level movements operating through the quantity equation has not led to convincing deductions. The discussion of the trade cycle became unmoored from the quantity equation and its long-period framework when the expected effects of the cycle itself were permitted to affect aspects of the framework, particularly the natural rate. Keynes' approach to changes in the level of output undergoes a fundamental shift when he adopts the theory of effective demand and the multiplier, and when he situates them in the short-period. This short-period analysis, unlike the long-period

identified with the quantity equation, is in the nature of a "partial" equilibrium analysis in the sense of not implying the stationary- or steady-state consequences. It is also a partial analysis in the sense that Keynes impounds within a ceteris paribus clause the effect on the desired current output level due to changes in capacity that are in turn due to realized investment plans, although the effect on the investment decisions of changes in the level of capacity due to realized investment is embodied in the negative slope of the marginal-efficiency-of-capital schedule [Keynes (1936) p.136].[2]

Even in the partial-equilibrium senses described above, it is not enough for Keynes to simply assert the multiplier and the theory of effective demand; for his equilibrium to approximate reality in his temporally limited sense he must argue against the effectiveness of interest-rate and wage-rate flexibility as bearers of eventual full-employment equilibrium. That requirement arises due to the fundamental role we have seen their flexibility play in the disequilibrium processes leading to full employment described by Marshall and Wicksell, and presented in the Treatise. It can be conjectured that Keynes anticipated that his critics would turn to these flexibilities. In addressing these potential critics in the General Theory, Keynes lays down an early defense, but also points to the literature he was familiar with and out of which the General Theory arose. Further it clears the way for Keynes to assert his own adjustment process embodied in the short-period multiplier, a process potentially adjusting to less-than-full employment.

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[2] On the second of these effects see footnote six.

In this chapter we will first outline the conceptual environment of the General Theory's short-period analysis and the direction along which Keynes suggests a long-period theory would proceed. The point is to document the conceptual shift entailed by the theory of effective demand and the multiplier, and to ask how we now characterize the values of variables under discussion. Second, we will outline Keynes' defense against established theory; that is, we will look at his arguments against the effectiveness of wage- and interest-rate flexibility at restoring full employment. These latter arguments are important in establishing the persistence of less-than-full employment conditions, though given the circumscribed nature of the General Theory's equilibrium, persistence of less-than-full employment does not imply a unique equilibrium. Finally we will analyze Keynes' new perspectives on the natural rate and the quantity theory, and use this discussion to demonstrate his proposition that the "classical" perspective is but a special case [Keynes (1936) p.3].

The General Theory's Method of the Short-Period

Unlike the Treatise on Money, the General Theory is explicit in describing the environment in which we are to imagine its analysis occurring. Keynes systematically outlines the "given" factors, "the independent variables," and "the dependent variables."

> We take as given the existing skill and quantity of available labour, the existing quality and quantity of available equipment, the existing technique, the degree of competition, the tastes and habits of the consumer, the disutility of different intensities of labour and of the activities of supervision and organisation, as well as the social structure including the forces, other than our variables set forth below, which determine the distribution of the national income. Keynes (1936) p.245.

The factor among the givens that differentiates Keynes' short-period from Marshall's long-period is the "quantity of available equipment," precisely the given factor that defines Marshall's short-period in which entrepreneurs are free to alter their output decisions. Keynes further states that we are not to "assume these factors are constant," but for the sake of his analysis we are not considering "the effects and consequences of changes in them" [Keynes (1936) p.245]. That suggests the abstract nature of Keynes' analysis, but does not inhibit the view that the analysis is grounded in an historically given context.[3]

> The independent variables are
>
> ...in the first instance, the propensity to consume, the schedule of the marginal efficiency of capital and the rate of interest... Keynes (1936) p.245.

And, Keynes goes on that

> ...our ultimate independent variables...[are]...(1) the three fundamental psychological factors, namely, the psychological propensity to consume, the psychological attitude to liquidity and the psychological expectation of future yield from capital-assets, (2) the wage-unit as determined by the bargains reached between employers and employed, and (3) the quantity of money as determined by the action of the central bank... Keynes (1936) pp.246-247.

The dependent variables, those determined by the analysis, are the "volume of employment and the national income" [Keynes (1936) p.245]. Earlier Keynes criticizes "traditional analysis" for taking the dependent variables, "Saving and Investment," as the independent variables or determinants; the latter he identifies in the first of the

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[3] Robinson (1973 p.xv) suggests not only viewing Keynes' analysis as initiated from a historical moment, but also occurring in actual time. This theme has been developed by Asimakopulos (1988 pp.2-4).

above quotes [Keynes (1936) pp.183-184]. There is no presumption--either in the given factors or the independent variables -- of a stationary state and its attendant full-employment assumption as we found in Marshall's monetary theory. Robinson (1973 p.xv) has remarked that Keynes "brought the argument down from timeless stationary states into the present." But it is a "present" of the short-period defined by the given productive capacity. It is in Keynes' "daily" unit of time that firms determine their output and employment levels, but not their capacity in plant and equipment [Keynes (1936) pp.46-47].

Underlying the marginal efficiency of capital and liquidity preference is "the state of long-term expectation"; implicitly then, to solve Keynes' model at any moment in time the state of long-term expectation must be unchanging [Keynes (1936) p.148].[4] In fact Keynes introduces two types of expectations: short-term expectations and long-term expectations. The former determine the entrepreneurs' output decisions given their productive capacity [Keynes (1936) pp.46-47 p.148]. It is the short-term entrepreneurial expectations of proceeds that underlies Keynes' aggregate supply price and determines the current period's level of aggregate employment [Keynes (1936) p.24]. "The actually realised results" or proceeds are

...only...relevant to employment in so far as they cause a

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[4] To speak of a solution to Keynes' system at a moment of time is in keeping with at least one passage where he speaks of "enough simultaneous equations to give us a determinate result" [Keynes (1936) p.299]. But it should be pointed out that Keynes objects to such "symbolic pseudo-mathematical methods" due to the assumed "strict independence between the factors involved" [Keynes (1936) p.297]. Pasinetti (1974 pp.44-45) presents a "causal" formulation of Keynes' system.

modification of subsequent expectations. Keynes (1936) p.47

In general, short-term expectations fall to the wayside in Keynes' discussion of the factors, including the state of long-term expectation, that constitute his independent variables. This is because he largely proceeds from the perspective that either short-term expected outcomes are realized at the equilibrium short-period level of effective demand [Keynes (1936) pp.25-30][5] or that short-term anticipated and actual outcomes "run into and overlap one another" leading to "gradual" change in short-term expectations [Keynes (1936) p.50].

Long-term expectations are of a different nature; they predominate in Keynes' discussion of investment decisions, both real and financial; and through their change they introduce the volatility that the economy experiences. Keynes initially introduces long-term expectations as the expected "shape of future returns" contemplated by an entrepreneur considering investing in "an addition to his capital equipment" [Keynes (1936) p.47]. The "future returns," of course, reappear as the "series of prospective returns" which comprise in part, along with the supply price of the equipment, his marginal efficiency of capital; they together determine his aggregate investment demand schedule [Keynes (1936) pp.135-136].[6]

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[5] For a discussion of the difficulties that arise in understanding Keynes' short-period equilibrium, particularly due to Keynes' aggregate demand function, see Asimakopulos (1982) and the references cited there.

[6] On the temporal difficulties with Keynes' marginal efficiency of capital schedule see Asimakopulos (1971, 1988) and Targetti and Kinda-Hass (1982). The latter is a translation of Kalecki's 1936 review of the General Theory.

Keynes proceeds to tie real investment to financial markets through the modern firm and "organised investment markets" which permit ownership to be separated from management [Keynes (1936) p.150]. Chapter Twelve: "The State of Long-Term Expectation" quickly moves from a discussion of "prospective yields" on real capital to those on "assets" in general.

> ...the Stock Exchange...inevitably exerts a decisive influence on the rate of current investment. For there is no sense in building up a new enterprise at a cost greater than that at which a similar existing enterprise can be purchased; whilst there is an inducement to spend on a new project what may seem an extravagant sum, if it can be floated off on the Stock Exchange at an immediate profit. Keynes (1936) p.151.

Keynes expounds his criticism of a stock market dominated by speculative professional investors second-guessing "mass psychology" and generating a casino-like atmosphere [Keynes (1936) pp.153-161]. His criticism is aimed to point out that "the capital development of a country" will be "ill-done," if it is simply the "by-product" of stock-market speculation [Keynes (1936) p.159]. The stock market, in conjunction with the above discouragement and encouragement it provides, helps define an entrepreneur's "confidence" in his real-capacity investment decisions due to the actual "extreme precariousness of the basis of knowledge" for estimating future returns [Keynes (1936) pp.148-149]. "The state of confidence is...one of the major factors" defining the marginal efficiency of capital or the investment demand schedule [Keynes (1936) p.149].[7]

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[7] For a view of firms' investment activities that are reasoned to be relatively stable over the business cycle, not swamped by "mass psychology," and where real investment activity is not seen as nearly synonymous with stock-market activities see Eichner (1976) and Levine (1984).

In a similar manner, Keynes introduces "mass psychology" as a determining factor lying behind the liquidity preference schedule, particularly in the latter's speculative motive for holding money balances [Keynes (1936) p.170 pp.199-202]. It is

> ...the existence of uncertainty as to the future of the rate of interest...[and] an organised market for dealing in debts... Keynes (1936) pp.168-169

that leads to variation in opinion as to the expected future interest rate.[8] A change, such as in the quantity of money, must not be such as to change the relative standing of bearish and bullish opinion of the future interest rate or, we can suppose, the confidence investors have in their opinions, for the liquidity-preference schedule to remain stable [Keynes (1936) p.173 pp.197-199].

Given the state of long-term expectations fixing both the investment demand and the liquidity-preference schedules, Keynes can determine the short-period equilibrium level of employment and output by assuming the other components of his model and the operation of the multiplier. What is most interesting from the perspective of our earlier descriptions and discussions of the trade cycle in the context of the quantity theory and its long-period context are the roles that we can argue are played by the state of confidence and by long-term expectations in the General Theory's short-period context. We asked in the former context why the natural rate does not change over the course of the business cycle, particularly as we anticipate that expectations do change? We saw the focus on full-employment price-

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[8] Keynes (1936 p.201) reiterates "that uncertainty as to the future course of the rate of interest is the sole intelligible explanation" for the speculative motive to hold liquid balances.

level adjustments acting through the quantity equation framework, even though Marshall speaks of a "dull heavy calm," Keynes of a cyclically sensitive natural rate, and Wicksell of cyclically convergent price expectations. In effect, confidence and expectations were assumed to be sufficient to restore full employment, aided, at times, by an implicit presumption of a marginal propensity to consume of one. The adjustment process in the General Theory is given by the multiplier and the theory of effective demand. The possibility of a stable solution arising through the adjustment is contingent on the stability of the state of confidence and the state of long-term expectations, regardless of their current level. The state of confidence and of long-term expectations operating through the investment demand schedule and the liquidity-preference schedule have taken a role in the short-period that the natural rate played in the quantity equation's long-period; that is, they stabilize the economic system and allow it to converge on an equilibrium. Unfortunately, one role of the natural rate is lost in shifting to Keynes' short-period; in the long-period quantity theory context it acted to determine the equilibrium money rate of interest. Keynes leaves us asking what determines the "safe" or "expected normal" interest rate around which future uncertainties can be formulated [Keynes (1936) p.203]?[9] The question is important since we how have "a different natural rate...for each hypothetical

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[9] Garegnani (1979 p.53) raises the same question, remarking that there is "a serious element of indeterminacy" in Keynes' theory of the interest rate. Garegnani in his criticism of Keynes is asking him to supply a theory of the interest rate that both parallels in function and replaces the long-period neoclassical theory embodied in the natural rate.

level of employment" [Keynes (1936) p.242].

The General Theory's short-period equilibrium reflects its Marshallian origins, and also shares the weaknesses of the short-period. In a short-period equilibrium, expected proceeds equal realized proceeds at the multiplier-generated level of effective demand; entrepreneurs have no incentives to adjust their level of employment and output. Ongoing investment, though obviously augmenting capacity, does not affect employment and output decisions due to changes in capacity by assumption. Aggregate investment, through its multiplier income-generating effect, does affect the level of employment and output; and this effect is embodied in the equilibrium. The equilibrium occurs in a context with a given state of confidence and a given state of expectations. Marshall's short-period trade cycle left us wondering, particularly in the case where we conjectured a change in prospective profitability, how the eventual adjustments would align themselves within his long-period framework. Ultimately it must be something like Wicksell and the Treatise's natural rate, cyclically independent, which acts to attract the economy back to stationary- or steady-state conditions. In the case of the General Theory there is a similar weakness, but the framework itself suggest routes that a long-period theory might travel. One such direction would be the effect that capacity expansion has on the entrepreneurs' desired level of output. Another direction would be the effect that changing aggregate-income levels, due to the actual changes in investment, have on the prospective yields of investments. Alternatively, and perhaps in conjunction, changes in aggregate income

and employment could be considered to change the states of confidence and long-term expectation. These channels are opened in the General Theory's short-period equilibrium due to the assumptions of given and stable expectations and the ignoring of changes in capacity. To borrow from Asimakopulos (1988 p.4), the short-period equilibrium, and the short-period itself, "is not 'self contained.'"[10]

Keynes, as an exercise, defines "long-period employment" as a "steady level of employment" which would come about[11],

> If we suppose a state of expectation to continue for a sufficient length of time for the effect on employment to have worked itself out so completely that there is...no piece of employment going on which would have taken place if the new state of expectation had always existed... Keynes (1936) p.48.

He remarks that each state of long-term expectation has a "corresponding level of long-period employment," not necessarily a constant level, if growth of population is included in the "unchanging expectation" [Keynes (1936) p.48 fn.1]. Keynes describes the "transition" to a new long-period employment level as cyclical in nature due to the building up or the running down of "processes of production" [Keynes (1936) pp.48-49]. The constancy of long-term expectations, and presumably their realization, are acting as a surrogate for the natural rate, bringing about a steady level of

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[10] Asimakopulos (1988 p.17 fn.5) tells us he borrowed the term, 'self contained,' from Hicks (1985). Or see Hicks (1965 p.32).

[11] Keynes (1937a p.105) defines the "conditions of long-period equilibrium" as circumstances which have

> ...a state of expectations which is both definite and constant and has lasted long enough for there to be no hangover from a previous state of expectations.

Associated with the long-period equilibrium we might assume we would find a level of long-period employment.

employment. Unlike the steady state defined by the natural rate or its equivalent, which is defined at a full-employment level, long-period employment is not necessarily full employment. This is an equilibrium that borrows from Marshall's long-period sense of the term; the processes described imply that capacity has been adjusted to the level of aggregate demand that the state of long-term expectation and its investment level generate. Keynes does not dwell on the growth potentials of the process he is describing, but Harrod's warranted growth rate may implied. It is to be noted, though, that Keynes is simply describing a special hypothetical short-period equilibrium, one in which the "state of expectations [long-term] had always existed" [Keynes (1936) p.48 my brackets].[12] This special equilibrium is not to be confused with the central message of the General Theory as Eatwell (1979), Milgate (1982), and Panico and Petri (1987) would have it.[13]

If the economy's hypothesized movement to a long-period employment equilibrium is "complicated in detail" by cyclical developments, the actual economy's movement through time will be "more complicated still" [Keynes (1936) p.50].

> For the state of expectation is liable to constant change, a new expectation being superimposed long before the previous change has fully worked itself out; so that the economic machine is occupied at any given time with a number of

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[12] For a similar point of view see Asimakopulos (1985 pp.42-44) and Asimakopulos (1984-1985).

[13] See the "Introduction" to this thesis, pp.13-16. It is to be noted that unlike Eatwell (1979 p.98), Milgate (1982 p.87), and Panico and Petri (1987 p.239), who state that Keynes intended to present a long-period theory, now it appears that Eatwell (1983 pp.272-274) understands Keynes' intentions were to present a short-period theory. Eatwell (1983) wants to construct a long-period theory using, at least partially, Keynes (1936) as a foundation.

> overlapping activities, the existence of which is due to various past states of expectation. Keynes (1936) p.50.

The complications added to the economy due to shifting "animal spirits" lead to an intractable maze [Keynes (1936) p.161]. Kahn (1984 p.142) and Asimakopulos (1985 p.41) both assert that fluctuations in long-term expectations must be put on the same footing as the theory of effective demand when pronouncements are made about the central message of the General Theory. Keynes remarks that the course of events may be yet more complicated because the liquidity-preference schedule, the marginal efficiency of capital, and the marginal propensity to consume may shift or change with government expenditure (public-works expenditures) and changes in the money supply, not simply from the expansion of aggregate demand due to entrepreneurial spirits [Keynes (1936) pp.119-121 p.173 p.249].

Keynes states that he hopes to undo the "large element of unreality" imparted to economic thinking by "the assumptions of the static state" with the introduction of his concept of the marginal efficiency of capital and its highlighting the importance of changing views of the future [Keynes (1936) pp.145-146]. In general, Keynes' short-period methodology alerts us to the limitations of stationary-state conclusions. It is to be contrasted with "orthodox theory" which is "particularly applicable to the stationary state" [Keynes (1937a) p.107] and "concerned with what we now call long-period analysis" [Keynes (1937b) p.112]. To support his methodological position Keynes addresses the adjustment mechanisms of the long-period models we have explored: wage- and interest-rate flexibility. It is to these that we how turn.

Wage Rate and Interest Rate Flexibility: Against Inherited Doctrine

We have described Keynes' short-period analysis and its equilibrium as not self-contained; we mean by this that it is both dependent on expectations of the future which are highly unstable and that the effect of augmented capacity on entrepreneurial decisions is not integrated. Another sense may be given to the terms; they may be taken to mean that there are "forces" at work in the short-period that define it as a disequilibrium or "unstable" state drawn to a "sustained" long-period equilibrium state which is "optimum or ideal" in the sense of implying "productive services...be fully employed" [CWJMK Vol.29 p.54, Vol.13 p.395]. The forces and effects that Keynes identifies "traditional doctrine" as relying on to draw the economy into the long-period, are wage-rate and interest-rate flexibility [CWJMK Vol.13 p.389]. As early as the 1931-1932 period of gestation of the General Theory draft chapters, Keynes is arguing for a less-than-full employment equilibrium, but remarking:

> We are not entitled, however, to apply this argument to the real world until we have disposed of two factors, which, in the judgment of traditional doctrine, enter in as equilibriating factors and together obviate the necessity of any such conclusion as that which we are propounding. The first of these is the reduction of the rate of wages; and the second is the automatic tendency in such conditions for a reduction in the rate of interest. CWJMK Vol.13 p.389.

It is no wonder that Keynes reaches this conclusion at this early date, since it is precisely these adjustments that he relied upon in the Treatise to bring about a long-period equilibrium, as did Marshall and Wicksell. Let us take these one at a time, drawing on Keynes'

arguments from the General Theory.[14]

Keynes makes a two-pronged argument against the effectiveness of "automatic" forces. One line of discussion is theoretical; the other is practical and involves the course of government and banking policy. The theoretical and practical lines of argumentation are not always separable. This is due to Keynes' method of theoretical attack. He presents, when considering either the wage rate or the interest rate, arguments in the mode of traditional theory, but also he presents arguments which either question the adequacy of the mechanisms implicit in traditional institutions and behavioral postulates or are set in an institutional mode and in behavior that he deems more accurate. For example, the theory of liquidity preference, as we will argue, is in part designed to specify a mechanism of activity misrepresented by traditional theory. When viewed from the level of theory specification, Keynes' alterations of the institutional structure and the behavioral postulates, and the arguments his derives from them, are in their nature theoretical and just as critical as, for example, the lack of fully integrating alterations in the level of output or income. The re-specifications advocated by Keynes can be anticipated to lead to new practical and policy conclusions.

Interest Rate Flexibility:

Keynes employs the well-known Harrod-Robertson diagram of the

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[14] For an early (1931-1932) presentation of the sub-optimal consequences of wage-rate and interest-rate flexibility, the reader can turn to CWJMK Vol.13 pp.389-396. The presentation reflects the Treatise's analytical framework and is devoid of an explicit multiplier.

loadable funds model of savings and investment[15], and claims they "do not furnish material for a theory of the interest rate" [Keynes (1936) p.181], since

> ...the assumption that income is constant is inconsistent with the assumption that these two curves can shift independently of one another. Keynes (1936) p.179.

Keynes calls this a "formal error" in the "classical" model [Keynes (1936) p.179]. The supply curve of savings will shift with each shift in the investment demand schedule, since a particular saving schedule's position is based on a given level of income which will change via the multiplier with the change in investment. Both curves, we may infer, will shift with a change in the level of income, if the changed level of income changes expected income which in turn is allowed to affect the state of long-term expectations. The latter is usually precluded by an assumption of a given state of long-term expectations. The shifting of the savings schedule from initial independent causes, for example from a changed attitude toward thrift altering the propensity to consume, will not generate a changed level of income through a changed level of investment stemming from a changed level of the interest rate. Due to the change in the marginal propensity to save and an inverse change in the multiplier, the change in the level of income that comes about brings the savings level back in line with the investment level, given the state of long-term expectations. A falling off of the level of investment, as we might expect in a slump, will not

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[15] The Harrod-Robertson diagram is presented in Robertson (1934) and is described in a letter from Harrod to Keynes [CWJMK Vol.13 pp.553-557] to which Keynes responds with the diagram [CWJMK Vol.13 pp.557-559].

be re-stimulated by a drop in the interest rate, since the savings level will fall in step with investment.

If we take Keynes to be mounting his criticism on the premises of traditional theory itself, the implication would be that savings are the source of bank leading -- for simplicity assume a managed-reserve pure-deposit checking and savings system[16] -- and as the level of savings falls the sources of funds fall, so no relief can be expected in the form of a reduced lending rate. Policy relief in the form of open-market operations or central-bank financing of public works is a possible avenue, but central-bank intervention is not considered to be one of the automatic forces. This -- at least the open-market operations -- brings us to Keynes' practical reservations, which we will review in a moment.

It was precisely the lack of comprehension of a relationship between changing income levels and changing savings levels that led to confusion when we tried to present a consistent explanation of Marshall's and the Treatise's trade cycle.[17] Keynes claims that "traditional analysis has been aware that saving depends on income" [Keynes (1936) p.184], but our earlier discussions of traditional theory makes this statement suspect. He rightly identifies, in the

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[16] "As a rule, I shall, as in my Treatise on Money, assume that money is co-extensive with bank deposits" [Keynes (1936) p.167 fn.1].

[17] In Wicksell's credit cycle we found nominal savings growing with nominal income, unlike in the Treatise or Marshall's credit cycles; the lack of credibility in his explanation arose due to his explicit full-employment assumption and his behavioral assumptions. The General Theory's criticism of him would, we might conjecture, focus on the latter two factors, on Wicksell ignoring real-income and savings-level changes, and on changes in long-term expectations or Wicksell's natural rate.

same passage, the integrating role of the multiplier and the theory of effective demand in bringing about the equality of savings to a given level of investment. This again suggests the fundamental organizing role the multiplier plays, as opposed to the quantity theory, in Keynes' short-period analysis. The paradox of savings, one formulation of the above criticism of traditional theory [Keynes (1936) pp.184-185], is just one implication of "short-period economics" [CWJMK Vol.29 p.35 p.54] running counter to the quantity equation tradition.[18]

Keynes' criticism of monetary policy effectuating the appropriate change in the interest rate and the level of investment is itself two-pronged. First, the effective working of monetary policy stimulating investment through a lowered interest rate will be hampered by fluctuations both in long-term expectations and in liquidity preference. Keynes is "sceptical"

> ...how far management of the interest rate is capable of continuously stimulating the appropriate volume of investment. ...since it seems likely that the fluctuations in the market estimation of the marginal efficiency of different types of capital...will be too great to be offset by any practicable changes in the rate of interest. Keynes (1936) p.164.

From this cause he anticipates the "State" to take "greater responsibility for directly organising investment" [Keynes (1936) p.164] to assure that it reaches its "optimum" or full-employment level

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[18] Keynes raises a secondary critical point that the savings schedule may be negatively sloped like the investment demand schedule, and therefore they may not "intersect...anywhere at all..." This, Keynes claims, should have "warned the classical school that something was wrong" [Keynes (1936) p.182]. It does not appear to have been sufficient warning for Keynes at the time he was writing the Treatise.

[Keynes (1936) p.378].[19] Under the first prong, two other avenues exist by which changes in long-term expectations may minimize any effect of a managed interest-rate policy. One would have a fall in long-term expectations raise the "lender's risk" premium on loans as slump conditions increase the rate of "involuntary default"; a lender's-risk premium would counteract, in some measure, a lowered "pure" interest rate [Keynes (1936) p.144]. The second avenue, perhaps synonymous with the first, is a collapse in "the state of credit"; this characterizes

> ...the confidence of the lending institutions towards those who seek to borrow from them... Keynes (1936) p.158.

and can be shaken by a collapse in the state of confidence. Keynes is not explicit about what institutions in particular he is discussing, though we might imagine member banks not following a central bank's lead toward lower interest rates.[20]

Second, Keynes, in part by introducing his liquidity-preference schedule as distinct from the investment demand schedule, is distinguishing between the motives to hold stocks or assets and the motives to hold bonds or debts. "[T]he state of bearishness" embodied in the liquidity-preference schedule describes a relationship

> ...between the rate of interest (or the price of debts) and the quantity of money,... Keynes (1936) p.173.

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[19] Kregel (1985) presents a discussion of Keynes' policy proposals from various of Keynes' writings; he concludes that Keynes recommended that government should control two-thirds to three-quarter of an economy's investment.

[20] Keynes (1936 p.200) uses the phrase "conditions of credit" when describing the banking system's interest-rate policy, and speaks of its "relaxation" being required "to induce someone to sell the banks a debt or a bond"; he does not speak of the banks' willingness to lend.

Bearishness in the Treatise described a relationship

> ...between the price of assets and debts, taken together, and the quantity of money. Keynes (1936) pp.173-174.

The consequence of this separation is to shift the Treatise's stock adjustment problem from an interrelationship between the interest rate, savings, and a generic debt/asset to a stock adjustment interrelationship between the interest rate, savings, and bonds [Keynes (1936) p.171]. Savings here is to be interpreted to mean the bearish holding of money balances for speculative purposes.[21] The latter of the two interrelationships describes the practical policy problem of open-market operations. Keynes identifies the speculative motive as "particularly important" in the transmission mechanism of "monetary management" [Keynes (1936) p.196]. From the perspective of traditional theory, the latter interrelationships represent a critical re-specification which emphasizes new behavior and mechanisms of activity.

Keynes summarizes the speculative bull/bear demand for money balances as

> ...a continuous curve relating changes in the demand for money to satisfy the speculative motive and changes in the rate of interest as given by changes in the prices of bonds and debts of various maturities. Keynes (1936) p.197.

> ...[T]he rate of interest and the price of bonds have to be fixed at the level at which the desire on the part of certain individuals to hold cash (because at that level they feel "bearish" of the future of bonds) is exactly equal to the amount of cash available for the speculative-motive. Thus each increase in the quantity of money must raise the price of bonds

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[21] "...[I]t is in respect of his stock of accumulated savings, rather than of his income, that the individual can exercise his choice between liquidity and illiquidity." Keynes (1936 p.194 my brackets). Also see Keynes (1936 p.166) where the same statement is rephrased; "his stock of accumulated savings" is referred to as "the amounts of his resources."

> sufficiently to exceed the expectations of some "bull" and so influence him to sell his bond for cash and join the "bear" brigade. Keynes (1936) p.171 my brackets.

The above "continuous curve" Keynes also refers to as the "liquidity function" and warns us that "changes in expectation" can shift the function bodily, particularly when expectation of "the future policy of the Central Bank or of the Government" change [Keynes (1936) pp.197-198]. For example, an expansion of the money supply may simply serve to shift the liquidity function upward, canceling or mitigating the expansion's effect on the interest rate [Keynes (1936) pp.172-173]. In the "causal nexus" -- the quantity of money, the interest rate, and investment -- any shifts in the liquidity-preference schedule confer on monetary policy, as a means to the optimal level of investment, Keynes' skepticism about its effectiveness [Keynes (1936) p.173].

Holding the money supply and monetary policy constant in considering liquidity preference relative to a critique of automatic forces, the stock adjustment which the liquidity function embodies may be such as to determine a sub-optimal interest rate and level of investment, even when such avenues as the Pigou effect are considered.

> ...[D]ifferences in environment and...differences in knowledge and interpretation of the new situation, Keynes (1936) pp.198-199,

presumably including a deflationary environment, alter expectations, arouse uncertainties, and shift the liquidity preference schedule in a "discontinuous" manner and degree [Keynes (1936) p.198].

Wage Rate Flexibility:

Keynes' acceptance of the first fundamental postulate of "classical" theory: "The wage is equal to the marginal product of

labour," does not imply that he accepted a direct causal relationship between them [Keynes (1936) p.5]. His acceptance follows from his acceptance of the proposition that "decreasing returns in the short-period" are operative, and therefore,

> In a given state of organization, equipment and technique, the real wage earned by a unit of labour has a unique (inverse) correlation with the volume of employment. Keynes (1936) p.17 my underlining.

The real wage and the level of employment are "uniquely correlated" only; the level of employment is not determined by the level of the real wage [Keynes (1936) p.17]. Further Keynes states that

> ...any means of increasing employment must lead at the same time to a diminution of the marginal product and hence of the rate of wages... Keynes (1936) p.18.

The General Theory's "means" of increasing the level of employment is through an increase in the level of effective demand; the employment associated with a level of effective demand will be "uniquely correlated" with a real wage, reflecting the marginal productivity of labor.[22]

Keynes argues:

> The propensity to consume and the rate of new investment determine between them the volume of employment, and the volume of employment is uniquely related to a given level of real wages -- not the other way around. Keynes (1936) p.30.

The causality runs from the level of effective demand determining the level of employment and the level of employment determining a unique real wage. The last causal link is unclear. Are the levels of employment and of the real wage simultaneously correlated or

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[22] As early as 1930, at the time the Treatise was published, Keynes expressed a similar view. See CWJMK Vol.13 p.180.

simultaneously determined? It is clear that Keynes does not consider the causality to run from the real wage to the level of employment to the level of output or the equilibrium level of effective demand.[23] We will find Keynes describing the mechanism as the traditional employment and output decision [Keynes (1936) pp.257-260]. Presumably relying on the principle of effective demand, Keynes states that a drop in the money wage, in a context which implies a drop in the real wage, will "not necessarily [be] a remedy for unemployment" [Keynes (1936) p.18 my brackets]. Unless, if we may anticipate his argument, the drop in the money wage affects the level of effective demand; that is, the fall in the money wage works indirectly on the hiring decision.

Keynes reasons that the traditional view of wage flexibility as an automatic force leading to full employment is a view based on a false "analogy"; the analogy arises in taking the implications of wage flexibility for a particular market and presuming they apply to the economy as a whole [Keynes (1936) p.260]. At the market level, a drop in the wage rate reduces costs and shifts the market-supply curve outward; and given a fixed market-demand curve, the equilibrium levels of quantity supplied and demanded are raised.

> ...[O]utput and employment [increase] up to the point where the reduction which labour has agreed to accept in its money-wages is just offset by the diminishing marginal efficiency of labour as output (from a given equipment) is increased. Keynes (1936) p.257 my brackets.

In effect the real wage has fallen, moving us along the market-demand

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[23] Wells (1987 pp.508-509) remarks on the same passages and states of Keynes' interpretation of the classical position: "The classical economists, it seems, simply had it backwards." Judging from the above quoted passages the "it seems" is an unnecessary qualification.

curve for labor that embodies "the diminishing marginal efficiency of labour." Applying this argument by analogy to the economy as a whole implies that a drop in the wage rate leads to an increase in the equilibrium level of output and employment or an increase in the equilibrium level of effective demand measured in "number of hours of labour" or in the wage-unit [Keynes (1936) pp.41-44 p.284].

The question Keynes explicitly poses to the analogistic thinking of traditional theory is formulated in money terms; it requires transformation by wage-units to reach the conclusion by analogy we just formulated. Keynes states:

> For the demand schedules for particular industries can only be constructed on some fixed assumption as to the nature of the demand and supply schedules of other industries and as to the amount of the aggregate effective demand. It is invalid, therefore, to transfer the argument to industry as a whole unless we also transfer our assumption that the aggregate effective demand is fixed. Yet this assumption reduces the argument to an ignoratio elenchi. For, whilst no one would wish to deny the proposition that a reduction in money-wages accompanied by the same aggregate effective demand as before will be associated with as increase in employment, the precise question at issue is whether the reduction in money-wages will or will not be accompanied by the same aggregate effective demand as before measured in money, or, at any rate, by an aggregate effective demand which is not reduced in full proportion to the reduction in money-wages... Keynes (1936) pp.259-260.

If aggregate effective demand remains the same, measured in money, it then increases, as measured in wage-units, with a drop in the money wage; a drop in the money wage then implies an increase in aggregate demand and employment. If nominal aggregate effective demand does not drop in full proportion with the drop in the money wage, then aggregate effective demand measured in wage-units rises, again implying an expansion of employment. The question he is asking is: Does the level

of equilibrium-effective demand in wage-units rise with the drop in the wage rate? This is the question that is raised by the traditional theory's analogy; it is to this question that Keynes directed his answers.

Keynes presents one version of a critique of traditional theory's argument by analogy where the price level falls "in almost the same proportion" as the initiating fall in the money-wage, since

> ...classical theory...has taught us...that prices are governed by marginal prime cost in terms of money and that money-wages largely govern marginal prime cost. Keynes (1936) p.12.

Keynes concludes that the level of the real wage, of output, and of employment remain "practically the same as before"; and the fall in the money-wage does not lead to a significant expansion in employment [Keynes (1936) p.12]. The price level does "not change in exact proportion to changes in money-wages" due to the existence of other components of marginal cost [Keynes (1936) p.259]. If we ignore the other factors in marginal cost, which are either user costs, and are netted out in the aggregate, or land-like factors not produced as intermediate products by other entrepreneurs, which are apparently minimally variable in the short-period[24], then it can be shown that the prices of goods fall in exact proportion with the money-wage, given a fixed level of investment. Employment remains constant at a not-necessarily full-employment level.[25] If we take Keynes' argument above

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[24] See Keynes' definitions of factor cost, user cost, and prime cost [Keynes (1936) pp.52-54].

[25] Jarsulic (1981) demonstrates Keynes' proposition that a fall in the money-wage leads to a proportionate fall in the price level, leaving the real-wage and employment level constant. He does this in a model with no intermediate factors and a given level of investment.

to apply to an isolated industry affected by an economy-wide decline in the money-wage, then it is clear he has neglected to mention the money-wage proportional decline in the industry-demand curve due to the drop in nominal aggregate demand. In other words, the industry-demand curve shifts downward in the same proportion as the industry-supply curve, both shifts due to the drop in the money wage. As it stands, Keynes' argument and its mechanisms are less than clear.

Keynes probes the question of the relationship between a money-wage reduction and the level of employment a second time in two different manners. First, he supposes that the propensity to consume, the marginal efficiency of capital schedule, and the interest rate (the quantity of money and the liquidity-preference schedule), his independent variables, are unaffected by a change in the money-wage. These conditions implicitly underlie the above-discussed critique; and Keynes comes to the same conclusions via this other route. Second, he proposes to assess the question by allowing for any "probable repercussions" of a change in the wage rate on the independent variables of his theory [Keynes (1936) p.260].

The equilibrium level of effective demand determines the level of short-period equilibrium employment; the latter will not change if the desired levels of proceeds, investment, and consumption are equal to their realized values, as they would be in short-period equilibrium

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He then generalizes the model in two manners; first, allowing an endogenous level of demand both for money and for plant and equipment and, second, amending the second model to allow a mark-up pricing scheme to replace the marginal-cost pricing model of Keynes. The latter models show that Keynes' proposition of no change in employment with a reduction in the money-wage is a special case, though the models do not lead to the contrary classical proposition either.

given the fixed schedules of the independent variables as in the first case. Keynes reasons that if entrepreneurs attempt to expand output and employment, that since individually their costs are reduced with a decrease in the money-wage, their anticipated proceeds will not be realized, unless either the marginal propensity to consume is one, so that the increased income from increased employment is consumed, leaving no "gap" in the form of increased savings between equilibrium income and equilibrium consumption for investment to fill, or

> ...there is an increase in investment, corresponding to the gap between the increment of income and the increment of consumption... Keynes (1936) p.261.

Both a marginal propensity to consume of one and an increase in investment have been ruled out by assumption.[26]

Keynes states that it is the "increment of income" due to expanded employment at the lower money-wage that leads to the gap between investment and savings, and therefore to the lack of realization of entrepreneurs' expected proceeds. But there is more to the story then this. Keynes argues that "only if" this gap were to be filled by additional investment, would the higher level of aggregate demand be

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[26] In an undated letter to Sraffa classified as having been written in the period when Keynes was composing the General Theory, Keynes presents a similar argument premised on money-wage cuts. Keynes concludes the letter stating:

> This is an example of the general principle that any expansion of output gluts the market unless there is a pari passu increase of investment appropriate to the community's marginal propensity to consume; and any contraction leads to windfall profits unless there is an appropriate pari passu contraction of investment.
>
> Thus, given the marginal propensity to consume, the amount of investment determines the equilibrium level of aggregate employment. CWJMK Vol.29 pp.159-160.

sustainable [Keynes (1936) p.261]. But out of whose income does the gap appear? Keynes may be writing as if it is out of the aggregate income that would be generated if there was sufficient investment to maintain the new level of employment and its level of equilibrium-effective demand. But it seems more appropriate, given Keynes' statements, to see him speaking of the income of those who are initially employed with the drop in the money-wage. The gap that appears then is only savings out of workers' income; it is only an initial gap and does not account for an even higher income level out of which entrepreneurs would consume and save. To generate this still higher income level would require yet additional investment, over that matching workers' savings, equal to the savings out of increased entrepreneurial income. Keynes has neglected to consider the equilibrium level of effective demand generated by the multiplier, and its required increases in the level of income and savings of both workers and entrepreneurs. The increased entrepreneurial income and savings, of course, never materializes, since by assumption those increments to investment do not occur. Suppose the workers' marginal propensity to consume is one; still the gap between capitalists' savings, out of now-higher proceeds, and investment needs to be filled with higher investment, or capitalists would have to be imagined to spend income with a marginal propensity to consume of one.

In the context of his critical example of the traditional model, Keynes does not discuss in detail further adjustments or the mechanism of entrepreneurial reevaluation of anticipated proceeds. We saw earlier that "the most recent results usually play a predominant part" in the

evaluation of expected proceeds [Keynes (1936) p.51].

> Thus the proceeds realised from the increased output will disappoint the entrepreneurs and employment will fall back again to its previous figure... Keynes (1936) p.261.

The non-materialized entrepreneurial income is not spent on the consumer goods produced; nor does the demand for investment goods rise to cover their increased production. Presumably the price level rolls back and with it the level of expected proceeds, both of the roll-backs eventually in proportion to the drop in the money-wage, driving back the level of employment. With them falls the level of aggregate income in money terms which is, of course, dependent on the level of money proceeds. Money aggregate effective demand is "reduced in full proportion," the real wage rises to its original level, and firms find themselves producing at the original lower level of output where the real wage equals the marginal efficiency of labor.

Implicit in Keynes' reasoning, as we have interpreted it, is an elastic "demand" for labor with respect to the money-wage, since as the money-wage falls the wage bill or workers' income rises. Keynes' argument at this stage is then based on a special assumption, but it can be generalized. If the labor-demand elasticity happened to be equal to one, the wage bill would remain the same with a drop in the money-wage and employment would initially rise. In this case no gap would appear between investment and workers' savings; yet new investment or change in the marginal propensity to consume would be required to maintain the expected level of effective demand. Capital's share grows absolutely and relatively to labor's share at the level of aggregate demand necessary to sustain the new higher level of

employment. Labor's earnings are constant, increasing capital's share. New investment would be necessary to fill the savings gap created by this would-be income of capitalists. The equilibrium income does not materialize either, in part or at all, as realized proceeds on the increased output disappoint expectations. If, on the other hand, the labor-demand elasticity were less than one, the wage bill would fall with a drop in the money-wage; new investment or an increase in the marginal propensity to consume still would be required to generate the share going to capitalists, and to maintain the higher level of effective demand, but since there is no new investment and there is no increase in the marginal propensity to consume, the increased income share for capitalists does not materialize. Again the expected proceeds are not realized and in both of the last two cases, as in the first, the money value of aggregate demand falls in proportion with the initial fall in the money-wage.

Keynes' implicit assumption of an elastic demand for labor is but a special case; and his argument is not as unequivocal as he supposes. But his general conclusion can be made to hold.[27]

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[27] Others who agree that effective demand limits the level of employment have found Keynes' argument that there will be no permanent change in the level of employment with alterations in the money-wage less compelling. For example, McCombie (1985-1986 pp.243-244) derives a positive "market hiring demand for labor" relationship between the real wage and employment by allowing the marginal-product-of-labor schedule to shift inward with a drop in the real wage. The same model is presented in McCombie (1987-1988). Davidson and Smolensky (1964 pp.163-166) derive a negative relationship between the money-wage and employment. They show that the aggregate-demand curve will not shift to the same extent as the aggregate-supply curve with a change in the money-wage due to a redistributive effect between rentiers and firms. With a rise in the money-wage and the price level, for example, rentiers' real consumption level decreases and the profits of firms increase; the firms apparently retain a fixed portion of their profits;

> Thus the reduction in money-wages will have no lasting tendency to increase employment... Keynes (1936) p.262.

The level of effective demand determines the level of employment and the real wage given the short-period competitive conditions of exchange and production. The demand for labor curve of traditional theory would appear then to have little behavioral significance in the sense of motivating entrepreneurial output and employment decisions. Entrepreneurs will find themselves producing on their demand for labor curves, that is, where the real wage equals the marginal product of labor, but the motivation comes from the side of aggregate demand.

Keynes proceeds to his second manner of analysis, allowing the money-wage reduction to influence the independent variables of his model. He catalogues seven "reactions," though he remarks, "This is not a complete catalogue of...possible reactions" of the independent variables to a wage reduction [Keynes (1936) p.264]. Keynes then focuses his analysis on the reaction of the marginal efficiency of capital and the reaction of the interest rate. In some of the outlined reactions, Keynes has a reduction in the price level follow from a reduction in the money-wage, since the money-wage is a component of prime cost; from this consequence he formulates a money-wage policy. The adverse effects of price-level changes on the state of expectations and confidence lead Keynes to argue for money-wage stability and the minimizing of price-level volatility from this source [Keynes (1936)

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and both effects inhibit the upward shift of the aggregate-demand curve. Keynes (1936 p.290) on the other hand suggests in his analysis of a similar scenario that entrepreneurs have a higher propensity to consume than rentiers; he apparently has a different view of the firm and its "management" then Davidson and Smolensky. Also see Keynes (1936 p.262).

pp.266-271].

The seven reactions are summarized below. The price-level reduction leads to a redistribution of real income "more likely to be adverse than favourable" to an expansion of effective demand, since it is redistributed from wage earners to non-wage-earning elements of prime costs and from entrepreneurs to rentiers, with entrepreneurs having a higher marginal propensity to consume than rentiers [Keynes (1936) p.262]. A wage- and price-level reduction relative to those of trading partners "will tend to increase the balance of trade" and act as a stimulant to investment and therefore a stimulant to effective demand [Keynes (1936) p.262]. Further, they will lead to a "likely" adverse movement in the terms of trade and a reduction of real income "which may tend to increase the propensity to consume" [Keynes (1936) p.263].

Expectation that the current money-wage reduction is relative to a future rise (fall) will stimulate (retard) investment and consumption [Keynes (1936) p.263]. The latter is presumably due to consumers taking advantage of low prices and stocking up. The former happens because the expectation that the price level will rise "stimulates investment," since entrepreneurs gain the confidence that their new plant and equipment "produced to-day" will maintain their profitability relative to future plant and equipment that embody "improved technique, which is content with a lower price" to maintain profitability [Keynes (1936) p.141]. If the supply price of capital goods is included in the price level under discussion, and presumably it is, then a fall in the current price relative to an expected rise in the price of the goods

they produce would also stimulate investment through a rise in the marginal efficiency of capital.

Keynes next argues that with a reduction in the money-wage the liquidity-preference schedule will shift inward, reducing the interest rate "and thus prove favorable for investment" [Keynes (1936) p.263]. It is interesting that the reason he gives for this shift is a "reduction in the wages-bill...and in money-incomes" [Keynes (1936) p.263]; this reason is contrary to his earlier-stated increase in money income through an increased wage bill, which we have investigated above in terms of the labor-demand elasticity. The suggestion now is that the labor demand is inelastic.

Keynes adds a complication; if the money-wage and price level are anticipated to rise in the future, as in the previous discussion of the marginal efficiency of capital, the reduction in the interest rate or

> ...the favourable reaction will be much less pronounced in the case of long-term loans than in that of short-term loans. Keynes (1936) p.263.

Presumably it is to the long-term loan market that entrepreneurs look when considering plant and equipment investment; on these expectational conditions they can expect no aid from the long-term market in facilitating their investment projects. Keynes is not clear, but depending on the extent of the anticipated price-level rise, the long-term rate will set up "an opposite tendency to those just considered" in the discussion of the marginal efficiency of capital [Keynes (1936) p.263]. Similarly the anticipation of further reductions in the wage rate and the price level, while lowering the long-term rate and favoring investment, will discourage investment by lowering anticipated

future yields. Compounding these opposing tendencies is the social unrest, "popular discontent," and shaken "political confidence" that wage reductions induce; they increase liquidity preference and "offset the release of cash from active circulation" [Keynes (1936) p.264].

The reduction in wages may induce "an optimistic tone" about investment, as entrepreneurs individually see their current cost reduced, shifting up the marginal efficiency of capital schedule. Running contrary to this tendency is again the social unrest or "labour troubles" that a money wage reduction induces, whether industry-specific or economy-wide [Keynes (1936) p.264]. Finally, Keynes introduces the "greater burden of debt" which follows from a decrease in the price level [Keynes (1936) p.264]. Creating private defaults, price-level reductions have "severely adverse effects on investment;" and the increase in the "real burden of the National Debt" is "very adverse to business confidence" as it raises the anticipation of higher taxes [Keynes (1936) p.264].

Keynes does not rank or weigh the various "repercussions," except implicitly in his choic' for follow-up discussion. He assumes a closed economic system, foreclosing on the balance of trade and the terms of trade, and assumes "there is nothing to be hoped" for in the direction of an increased propensity to consume [Keynes (1936) p.265]. His focus is on the marginal efficiency of capital schedule and the liquidity-preference schedule. Our above description suggests that the two are highly volatile in relation to a change in the money wage. The state of long-term expectations is reflected into the short-period through them, at the same time that a short-period event, the change in the

money wage, alters their state. There is an interdependence, a short-period conditioning of long-term expectations, which introduces a fluid, if not turbulent, nature to Keynes' system. The short-period takes on a prominence in the General Theory which it never would in a system dominated by the long-period values of the quantity theory and the natural rate. The choice of the marginal efficiency of capital and the liquidity-preference schedules for follow-up comments reveals something about Keynes' perspective on the economy. On the marginal efficiency of capital he largely repeats the above uncertainties concerning the future development of price-level and wage-rate changes [Keynes (1936) pp.265-266]. On the liquidity-preference schedule he again mentions social struggles, the burden of debt, and the loan market's expectation of future price-level developments, implicitly suggesting that they reenforce the pessimistic state of confidence characteristic of slump conditions [Keynes (1936) pp.267-269].

Interestingly, he draws us back to his criticism of traditional theory's view of the interest rate as an endogenous regulator ensuring full employment. "[T]heoretically" it is possible to reduce the interest rate either by holding the wage rate constant and increasing the money supply or by holding the money supply constant and reducing the wage rate [Keynes (1936) p.266]. Both are "subject to the same limitations" we discussed when considering an expansionary monetary policy; a small increase (decrease) in the money supply (wage rate) may not have a sufficient effect on the interest rate to restore investment to its optimal level, and a large increase (decrease) in the money supply (wage rate) may "offset its other advantages by its disturbing

effect on confidence" [Keynes (1936) pp.266-267]. Due to the social unrest that accompanies money-wage reductions, the growing burden of debt when the price level is tied to the wage level, and the unpredictable interaction between the liquidity-preference schedule and the marginal efficiency of capital in the face of wage-rate and price-level changes, Keynes advocates money-wage rigidity to give stability to the price level [Keynes (1936) p.253 pp.270-271 pp.303-304].

Keynes' comments reiterate a perspective on the economy which reveals instability arising from short-period events and adjustments interacting with the state of confidence and expectations. Keynes' method, as we outlined it earlier, referred us to a short-period defined relative to a given state of long-term expectations and confidence. We are now ask to imagine a series of evolving short-periods; these short-periods evolve out of each other as their internal adjustments alter their conditioning states of confidence and long-term expectations. Keynes later in the General Theory refers to this as a "shifting equilibrium" and ties it to an essential property of a monetary economy, where

> ...our previous expectations are liable to disappointment and expectations concerning the future affect what we do to-day. Keynes (1936) pp.293-294.

This perspective in some sense justifies what might be seen as an analytical incompleteness in Keynes' short-period method, particularly his short-period equilibrium. The incompleteness arises when Keynes specifies that the effects of changing capacity on the output decision can be ignored. The continual redefinition of the state of confidence and long-term expectations through short-period adjustments minimizes

the need for a short-period equilibrium concept that has more than a transitory nature. The construction of Keynes' equilibrium itself points to a perspective on the economy which sees it as unstable.

Shortly after the publication of the General Theory, Keynes uses the instability of the economy and the expectational uncertainties which it engenders to formulate a criticism of the classical theory. He writes:

> I accuse the classical economic theory of being itself one of these pretty, polite techniques which tries to deal with the present by abstracting from the fact that we know very little about the future. Keynes (1937b) p.115.

A "flimsy" knowledge of the future "subject to sudden and violent changes" defines the confidence that investors can have in their long-term expectations [Keynes (1937b) p.114]. From the above discussion we can conclude that current events alter investors' confidence and undermine the classical long-period analysis.

Keynes brings his analytical system forward and addresses the natural rate of interest and the quantity theory of money directly. He redefines the former relative to a less-than-full employment equilibrium and shows under what conditions the latter will operate as traditionally supposed, where a change in the money supply leads to a proportional change in the price level. We turn to these two concepts next; they are central to the long-period perspective we have discussed at length; and we now would like to describe their transformation in the short-period context of the General Theory. Their transformation is the transformation of classical theory to the General Theory's framework, and shows us that the monetary theory of Marshall, Wicksell, and the Treatise is but "a special case" [Keynes (1936) p.vii].

The Natural Rate and the Quantity Theory of Money Reconsidered

Keynes remarks that when he wrote the Treatise he "had not understood" that an economy could find itself in an underemployment equilibrium [Keynes (1936) pp.242-243]. The natural rate of interest, as he used it in the Treatise, he thought was "a development and clarification of Wicksell's 'natural rate of interest'"; he states that it was defined as a "unique rate of interest" that held when the level of saving equaled the level of investment, and was designed to insure "stability...of [the] price-level" [Keynes (1936) p.242 my brackets]. Keynes further states that he did not realize that

> ...there is, on this definition, a different natural rate of interest for each hypothetical level of employment....Thus it was a mistake to speak of the natural rate of interest or to suggest that the above definition would yield a unique value for the rate of interest irrespective of the level of employment. Keynes (1936) p.242.

In effect the natural rate has become, in the General Theory's short-period equilibrium where savings equals investment, a rate of interest determined by the interaction of the quantity of money and the liquidity-preference schedule.

Savings and income are defined differently in the Treatise; income contains entrepreneurial "normal or equilibrium profit,"

> ...not, as I now think, sufficiently defined if we allow for the possibility of changes in the scale of output... Keynes (1936) p.61

"[N]either" do they represent

> ...the profit...actually realised from their current operations nor the profit which they expected when they decided to undertake their current operations... Keynes (1936) pp.60-61.

We read in the second quote the phrase 'decided to undertake their

current operations' as representing the investment decision, the investment in plant and equipment decision, and the first quote as implying that changes in the level of current output were overlooked in the Treatise's definitions. Keynes is then stating that he did not simply define "normal" profits in the Treatise relative to the designed scale of output of a given configuration of plant and equipment given entrepreneurial profit expectations at the time of the investment decision. This would imply that "normal" profits are those that entrepreneurs "expected when they decided to undertake their current operations"; Keynes expressly denies this as the above quote states. Entrepreneurs may have expected abnormally high profits on embarking on their projects. "Normal" profits are not simply those of an isolated entrepreneur, but apparently reflect an economy-wide profit rate: the natural rate itself. This is what we would expect, given that the Treatise's analysis is framed in terms of the difference between the money rate and the natural rate of interest, and given its long-period stationary- or steady-state framework. The definition of "normal" profit and adjustments toward it, then, implicitly implies the appropriate level of designed capacity, given the natural rate.

Discussions of changes in the level of output under a given capacity are inappropriate within the context defined by the analytical devices of the natural rate and normal and abnormal profits (losses). A special case of the short-period equilibrium of the General Theory, in general defined relative to the level of output, is implicit in the Treatise's definition of income and savings and its capacity-adjusted long-period equilibrium. But the tools of the Treatise's analysis are

not designed to reveal the output equilbrium or an adjustment in output given capacity. The short-period equilibrium implicit in the long-period framework of the Treatise is one where output is at its capacity-designed level; and the latter conforms to the level of capacity consistent with the natural rate. It is no wonder then that questions of the output decision are rarely raised in the Treatise, and when they are, such as in the Treatise's discussion of the trade cycle, they are so awkwardly handled.[28]

The output and investment decisions are, of course, intertwined in the General Theory. They are separated conceptually in their respective definitions of short-term and long-term expectations, but investment as a determinant of aggregate demand determines the output level or the equilibrium level of effective demand, and changes in investment change the level of output. At least this is true up to the full-employment level, where thereafter, to simplify a little, "true inflation" begins [Keynes (1936) p.303].

In the General Theory's short-period equilibrium, expected proceeds

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[28] Keynes (1937a p.106) writes:

> If I am right, the orthodox theory is wholly inapplicable to such problems as those of unemployment and the trade cycle, or, indeed, to any of the day-to-day problems of ordinary life. ...The postulates which it requires, not having been stated, have escaped notice, with the result that deep-seated inconsistencies have been introduced into economic thought. The orthodox theory of the rate of interest properly belongs to a different stage of economic assumptions and abstractions from that in which any of us are thinking today.

Keynes goes on to suggest that orthodox theory belongs to a "stage of...theory" where the future is "definite and calculable" and the state of confidence does not vary [Keynes (1937a) p.107]. In such a world capacity could adjust to the natural rate of interest.

and profits are realized. But what determines the expected profits?[29] For Keynes' short-period, profit-maximizing firms, wherein supply price is equated to marginal prime cost, there is nothing "normal" about their profits [Keynes (1936) pp.24-25]. They are what they happen to be, presumably covering at least average variable costs. "Normal profit" enters as part of the difference between "long-period supply price" and "long-period cost" along with prime cost and supplemental cost [Keynes (1936) p.68]. Normal profits are calculated at the time an entrepreneur "buys or constructs his equipment" to cover

> ...the current rate of interest on loans of comparable term and risk, reckoned as a percentage of the cost of the equipment. Keynes (1936) p.68.

The interest rate on long-term loans, Keynes has argued, is determined by the state of confidence and long-term expectations. Further we have argued that changes in the short-period, for example a drop in the money wage, an expansion in the money supply or the growth of speculative stock-market activity, will alter long-term expectations and the state of confidence. What we have suggested is that the General Theory's "natural rate," the state of confidence and expectation, ties the long-period to short-period changes; particularly now, they are seen to operate through the interest rate, and are manifest through the long-period expected supply price of goods when investment in the means to their production is being considered.

In Keynes' own considerations of the natural rate, having found a "different natural rate" for every level of equilibrium-effective

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[29] That is to ask Garegnani's question of the relationship of the expected interest rate to the expected proceeds and profits [Garegnani (1979) p.53].

demand, he remarks that

> It is merely the rate of interest which will preserve the status quo; and, in general, we have no predominant interest in the status quo as such. Keynes (1936) p.243.[30]

He prefers to define "the optimum rate" or a "unique and significant" interest rate as the "neutral rate of interest," where savings equals investment, the price level is stable, and there is full employment; in other words, it is an effective demand equilibrium where "the elasticity of employment as a whole [with respect to the level of aggregate demand] is zero" [Keynes (1936) p.243].[31]

Keynes tells us that "perhaps," since the quantity theory is based on the assumption of full employment and the assumption of no speculative demand for money,

> ...it is a great fault in the Quantity Theory that it does not distinguish between changes in prices which are a function of changes in output, and those which are a function of changes in the wage-unit. Keynes (1936) p.209.

We have argued that the full-employment assumption is implicit, if not explicit at times, in the Treatise and in the works of Wicksell and Marshall that we have examined; but contrary to Keynes' statement we also have seen explicit reference, and sustained discussion of speculative balances or a pervasive bearishness that affects all lenders including the banking system, at least in the early work of

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[30] Later, Keynes (1936 p.328) remarks that "there is no special virtue in the pre-existing interest rate."

[31] In a letter to Hicks after the publication of the General Theory, Keynes writes:

> If I were writing again, I should indeed feel disposed to define full employment as being reached at the same moment at which the supply of output in general becomes inelastic. CWJMK Vol.14 p.71.

Also see Keynes (1937a pp.105-108).

Keynes and Marshall. We attempted to characterize the slump of the trade cycles or the credit cycles of Marshall and the Treatise by reference to less-than-full employment and increased demand for speculative balances. In the theories of inflation and deflation we found at minimum, in Wicksell, a full-employment assumption, and in Marshall and the Treatise both a full-employment economy and speculative balances. The quantity theory's "fault," or its users' fault, is the non-integration of an analysis of output and price-level movements, and a bias toward the latter that is predicated on the full-employment assumption. The General Theory takes up the quantity theory again, integrating the elements of the short-period framework.

Keynes characterizes the "simpler discussion" of "the Theory of Money and Prices" as one where prices are proportional to the quantity of money or

> ...the elasticity of supply [of output] must have become zero and demand [for output] proportional to the quantity of money; whilst in the more sophisticated we are lost in a haze where nothing is clear and everything is possible. Keynes (1936) p.292 [my brackets].

The haze is composed of such concepts as forced saving, the velocity of circulation, the quantity of money, hoarding, the volume of transactions, "et hoc genus omne" [Keynes (1936) p.292]. In contrast to the theory of money, "the Theory of Value" explains prices

> ...by the conditions of supply and demand; and, in particular, changes in marginal cost and the elasticity of short-period supply... Keynes (1936) p.292.

Keynes wants to bring the theory of money "back to close contact with the theory of Value" by relating the former to the latter's "notions of the elasticities of supply and demand" in a context that discusses "the

Theory of Output and Employment as a whole" [Keynes (1936) pp.292-293]. Keynes proceeds to incorporate the quantity equation into his short-period theory by utilizing a series of elasticity concepts and their interrelations.

Keynes demonstrates that $e_p=1-e_o(1-e_w)$ where: e_p is "the elasticity of money-prices in response to changes in effective demand" in terms of money; e_o is the elasticity of output with respect to changes of effective demand in wage-units; and e_w is the elasticity of the money wage with respect "to changes in effective demand in terms of money" [Keynes (1936) p.285]. e_o is greater than or equal to zero and less than or equal to one [Keynes (1936) p.284], and presumably e_w is usually of the same nature. When either $e_o=0$ or $e_w=1$, a change in nominal effective demand will lead to a proportional change in the price level [Keynes (1936) p.286]. When e_o is greater than zero and less than or equal to one, e_w must be greater than or equal to zero but less than one in order for an increase in nominal demand to be meaningful to employment. The percentage change in nominal effective demand must be greater than the percentage change in wages or the wage-unit, for output to increase with an increase in nominal demand; effective demand in wage-units rises and only part of the rise in nominal effective demand is dissipated in a rise in the price level; part represents increased output and employment. If $e_w=0$, the extent to which an increase in nominal effective demand dissipates in a price-level increase instead of in an output and employment increase depends on the "returns" to employment.

Keynes (1936 p.305) utilizes e_o as the elasticity of output with

respect to changes in employment, so that when he there writes $e_p=1-e_e e_o(1-e_w)$, where e_e is the elasticity of employment with respect to effective demand in wage-units [Keynes (1936) p.282], the earlier e_o now equals the current $e_e e_o$.[32] If there is any mystery in the last equality, it disappears when it is remembered that Keynes' "two fundamental units of quantity" are money quantities and labor quantities; and that therefore e_e is equal to one, since the percentage change in effective demand in wage-units, a labor quantity, is equal to the percentage change in employment, the same labor quantity [Keynes (1936) p.41].[33] e_o, defined as the elasticity of output, with respect to a change in employment is equivalent to it defined with respect to a change in effective demand in wage-units.

It is through e_o or $e_e e_o$ that the theory of value enters Keynes' system. They embody the technical condition of supply, and reveal the interaction of demand and supply for output "as a whole." They represent

> ...the physical factors which determine the rate of decreasing returns as more employment is applied to the existing equipment.
>
> ...if there are constant returns throughout so that marginal return equals average return, $e_e e_o=1$; and if there is full employment either of labour or of equipment, $e_e e_o=0$. Keynes (1936) pp.305-306.

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[32] Keynes (1936 p.304) defines e_o as the elasticity of output with respect to a change in effective demand in money terms, while on p.284 it was defined with respect to effective demand in wage-units. These definitions are equivalent. e_o on p.304 equals $(dO/dD)(D/O)=(dO/dD)[(WD_w)/O]=[dO/(dD/W)](D_w/O)=(dO/dD_w)/(D_w/O)$ which equals e_o on p.284, where D equals effective demand, W the wage-unit, D_w effective demand in wage-units, and O output.

[33] See Chick (1983 p.273) for the same conclusion.

With a constant wage rate, generically speaking to include the prices of other inputs, under "constant returns" the aggregate supply curve would be a linear ray from the origin in expected proceeds-employment space. Under decreasing returns the aggregate supply curve would be convex from the origin.[34] Introducing wage flexibility, if there are constant returns, $e_o=1$, then the percentage change in the price level is the same as the percentage change in the money wage induced by a change in nominal effective demand. This will imply increased employment and output if the money-wage rate does not increase by the same proportion as nominal effective demand, that is, if $e_w<1$ and effective demand in wage-units rises. If there are decreasing returns, $e_o<1$, and if $e_w<1$, then the percentage change in the price level is greater than the percentage change in the money wage induced by a change in nominal effective demand, yet there is an increase in employment. The relevant case in comparison to the last case, Keynes' case, is the classical case where $e_o=0$ and $e_p=1$ even if $e_w<1$; in the classical case there is no increase in employment and output.[35]

To introduces the quantity of money into the elasticity framework, Keynes defines two other elasticities: the elasticity of effective

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[34] Keynes (1936 pp.295-296 pp.299-300) again discusses constant and decreasing returns. Also see Asimakopulos (1982 pp.26-27 and appendix) and Davidson and Smolensky (1964 pp.126-128).

[35] If $e_o=1$ in $e_p=1-e_o(1-e_w)$, then $e_p=e_w$, and for $e_o=1$ to be meaningful to employment it must be the case that $e_w<1$. If $0<e_o<1$ and $e_w<1$, Keynes' case, then $e_o=(1-e_p)/(1-e_w)<1$, implying $1>e_p>e_w$, and employment increases. If $e_o=0$, the classical case, then $e_p=1$ even if $e_w<1$, and by assumption employment does not change. For example, suppose $e_w=1/3$, then in the first case of constant returns, $e_p=e_w=1/3$; in the second case, Keynes' case, where, say, $e_o=2/3$, then $e_p=5/9$; and in the third case, the classical case, $e_p=1$.

demand in money terms with respect to a change in the quantity of money, e_d, and the elasticity of prices with respect to a change in the quantity of money, e. The elasticity of the price level with respect to a change in the quantity of money, e, is equal to $e_p e_d = e_d - (1 - e_w) e_d e_e e_o = e_d (1 - e_e e_o + e_e e_o e_w)$ [Keynes (1936) p.305]. Keynes considers e "a generalised statement of the Quantity Theory of Money" because it

> ...gives us the proportionate change in prices in response to a change in the quantity of money... Keynes (1936) p.305.

e_d represents "the liquidity factors which determine the demand for money" [Keynes (1936) p.305]. Keynes did not "attach much value to manipulations of this kind," and having laid out the interrelations between the elasticities, he does not dwell on the interpretative details, leaving it to the reader to construct his argument [Keynes (1936) p.305]. We will attempt to uncover some of these details, at least as they bear on his criticism of the quantity theory.

If the demand for money is some "constant proportion" of money income or of "the quantity of effective demand" in nominal terms, then $e_d = 1$ [Keynes (1936) p.306 p.299]. That the demand for money is a constant proportion of money income is a premise Keynes attributes to the classical tradition of the quantity theory [Keynes (1937a) pp.105-107 (1937b) pp.115-117]. Alternatively stated, if V, the "income-velocity of money," that is, the effective demand velocity of money, is constant, then $e_d = 1$, where $V = (D/M)$, with D representing the level of nominal effective demand, and M the quantity of money [Keynes (1936) p.299 p.304]. Keynes restates the quantity equation as $MV = D$, so we can write it as $(DdM)/MdD) + (DdV)/VdD) = 1$ or $1 = (1/e_d) + e_v$, where we can call 'e_v' the elasticity of the velocity with respect to a change in the

level of nominal effective demand. The last equation can be written as $e_d=1/(1-e_v)$, so that if a constant proportion of nominal income or nominal effective demand is held in money balances, then $e_d=1$ implying $e_v=0$.

If there is no change in the velocity of circulation with an increase in nominal effective demand, then the money supply must increase to validate the price-level rise, regardless of whether the latter occurs in the context of the constant-returns case, Keynes' case, or the classical case. If the money supply does not accommodate the rises in nominal demand, then the price-level rise, to whatever extent achieved, is unstable. With no accommodation, nominal demand presumably falls toward its original level through the operation of an increased interest rate. To engage the quantity theory at the level of a critique we need to turn the question around by starting with an increase in the money supply. Given $e_d=1$, or a constant velocity, the price-level rise reflected in $e=e_de_p$ will be moderated by the conditions that determine e_p. Given a state of long-term expectations and confidence, an increase in the money supply, operating through a lowered interest rate [Keynes (1936) p.298], can be expected to increase the level of effective demand. This in turn will lead to an exactly proportionate increase in the price level only in the classical case where $e_p=1$ [Keynes (1936) p.304]; in the cases of constant returns or in Keynes' case, the price-level rise will be less, and least in the case of constant returns. The latter two, of course, presuppose that less-than-full employment conditions prevail. "e is, as a rule, less than unity" [Keynes (1936) p.306].

In a letter from H. Townshend (CWJMK Vol.29 pp.240-245) to Keynes shortly after the publication of the General Theory, Townshend questions the correspondence between Keynes' formulation of the quantity equation, in terms of both the effective demand's expectational values and its measurement, net-of-user cost, and the traditional formulation expressed in terms of total realized expenditures or transactions. Keynes responds by stating that

> ...the whole thing is in truth fundamentally artificial. I have got bogged in an attempt to bring my own terms into rather closer conformity with the algebra of others than the case really permits.
>
> ...[T]he trouble really arises from my trying to produce a closer analogy between my terms and those previously employed than the circumstances really justify.
>
> I think there is something suggestive in what I have written; and [if] I were to try to make it quite water-tight in light of your criticisms it would become so tortuous and complicated as to be worth less perhaps than in its vaguer form. CWJMK Vol.29 p.246 my brackets.

It is also clear that he did not fully abandon this manner of conceptualizing the problem or his differences with "orthodox theory" [Keynes (1937a) p.107]

> It is the elements of elasticity (a) in the desire to hold inactive balances and (b) in the supply of output as a whole, which permits a reasonable measure of stability in prices. If these elasticities are zero there is a necessity for the whole body of prices and wages to respond immediately to every change in the quantity of money. ...[T]he assumption that both of them are zero assumes away three-quarters of the problems in which we are interested. Keynes (1937a) pp.107-108 my brackets.

Townshend's criticisms are somewhat off the point of the purpose of Keynes' formulation and remarks in the General Theory, although Keynes' response to Townshend suggests that he was seeking a correspondence between his and the traditional perspective.

Keynes' criticism is in fact a criticism of an interpretive

implication of the quantity equation: that the price level and the level of money wages change in exact proportion to changes in the money supply. This is a proposition we have seen reasoned for repeatedly in the monetary theories of Marshall, Wicksell and the Treatise. The correspondence between Keynes' formulation of the quantity equation and the traditional formulation is a mute point, since it is the implication of a change in the money supply on prices, wages, and employment that is actually under discussion. In this sense, Keynes' formulation serves him perfectly well, whether or not it is a "generalised statement of the Quantity Theory of Money" [Keynes (1936) p.305].

Conclusion

We have used the General Theory's critique of "classical" monetary theory to situate the General Theory's short-period equilibrium. The defining characteristic of this equilibrium is not simply that Keynes holds plant and equipment constant, but that the long-period full-employment equilibriating force of the natural rate of interest found in "classical" writings has been uprooted. It has been transformed to the state of long-term expectations, and has become throughly dependent on short-period events, although for the sake of an analytical solution Keynes holds the state of long-term expectations or the state of confidence constant.

In evidence of our claim that Keynes perceived his model to contrast with the long-period framework of Marshall (1923), Wicksell (1898), and his own Treatise, we reviewed his arguments against the equilibriating potential of interest-rate and wage-rate flexibility.

In this exercise we reiterated the importance and fragile nature of investment expectations, and saw the importance Keynes attached to the multiplier and the principle of effective demand. It is clear that Keynes saw the latter two as an equilibriating mechanism competing with the traditional wage- and interest-rate flexibility mechanism, and in many respects saw the classical mechanism as disruptive to his less-than-full employment adjustment and inhibiting any equilibrium.

Finally, we investigated Keynes' remarks on the natural rate and his reformulation of the quantity theory. It is quite clear now what Keynes is referring to with the phrase 'classical theory'; he states that he has designed

> ...a more general theory, which includes classical theory...as a special case. Keynes (1936) p.xxiii.

He is referring to the "classical" monetary theories of Marshall, Wicksell, and the Treatise. They represent the special assumption of full employment and a correspondingly stable set of long-term expectations. Keynes' theory of effective demand in conjunction with the multiplier takes a first step toward an analysis of short-period phenomena. They formulate the organizing principles from which a theory of the trade cycle can be built without building in contrivances to force the price-level changes required in the quantity theory tradition.

Conclusion

Speaking first in the broadest of terms, we have demonstrated the following. We have shown the influence of the quantity theory of money on the theoretical structure of "classical" monetary theory. Particularly we found that the quantity theory was interpreted to require stationary- or steady-state conditions, and that these conditions defined the theoretical core. When we turned to explanations of the trade cycle in "classical" theory, we demonstrated an insufficient linkage between the theoretical core and these explanations, although the explanations were motivated by the same preoccupation with the quantity theory. The General Theory was developed in light of the insufficient linkage between theory and short-period events. We demonstrated that the General Theory incorporated in its state of long-term expectations, as a special case, the long-period stationary values of "classical" monetary theory. In the course of reaching these broad conclusions the following route was taken.

In Chapter One on Marshall's monetary theory, we first described Marshall's "statical method" as he presented it in his Principles. We found that it contained a notion of a stationary state with its attendant long-period implications. Although this concept was little utilized in the context of the Principles' industry-level partial-equilibrium analysis, we found the stationary state was raised to a level of great importance when Marshall took up questions in monetary theory, particularly in his description of the context in which the

quantity theory held. With this insight in hand we were able, by cross-reading Money, Credit, and Commerce with the Principles, to determine Marshall's implied views on investment and saving. This led us to conclude that he held a view of interest-rate determination which implies a long-period normal-equilibrium interest rate akin to a natural rate of interest determined purely by the real side of economic activity.

With this interpretive perspective in hand, as well as an understanding of Marshall's views on money and financial markets, we turned to his analysis of price-level trends and periods of economic crisis. In his analysis of inflationary and deflationary price-level trends we argued that the speculative behavior he describes takes place relative to a stationary state. We argued that this is implied by his assumption that real capital does not change and that the long-period interest rate is determined by "the average profitability of business in general" in full-employment "stationary" conditions [Marshall (1923) pp.256-258]. Although Marshall mentions that the price-level trends may be interrupted by periods of crisis, his argument implies that stationary-state values determine the eventual outcome.

For Marshall, "short-period fluctuations" in the price level are transitory relative to long-period values [Marshall (1923) p.19]. But we raised the issue, unaddressed by him, of a short-period equilibrium in his credit crisis by asking about the expectational consequences of the crisis, particularly since he explicitly states that the banking system and financial markets can fall under the spell of the current expectational state of the economy. Our tendency was to answer

positively to the possibility of an underemployment equilibrium in Marshall's system, though it is clear that Marshall did not hold such a view. Instead he relied on the dominance of long-period values to make themselves felt and equilibrate the economy at its full-employment potential. It is unclear, though, through what mechanisms these long-period values or their potentials were made known to Marshall's actors in the economy.

We found in Wicksell (1898) and in Keynes (1930a&b) an attempt to hone the mechanisms of long-period adjustment. But they continued in the quantity theory tradition with its emphasis on price-level adjustments, which led them to overlook the expectational consequences of less-than-full employment and led them to focus their attention on price-level adjustments.

In Wicksell (1898), the subject of Chapter Two, we found a clear statement that the natural rate of interest is the real rate of interest which would be determined in a non-monetized stationary economy. It was also made clear that the natural rate of interest acts as a "center of gravity" undisturbed by monetary factors. Wicksell's cumulative process of trend price-level movements was motivated by the differences that emerge between the natural rate and the market rate, but these price-level movements were held to leave the natural rate unchanged. Even when the relative structure of production was cyclically transformed by a deviation of the money rate from the natural rate and the perceived profitability of different lines of production changed, production and the economy eventually reconfigured itself, with the aid of central-bank intervention, at the unchanged

natural rate.

In Wicksell's systematic presentation of the cumulative process we also saw the dependency of nominal savings on nominal income, although Wicksell has contrived his behavioral assumptions so that the level of real savings remained constant, and the economy's growth was constrained. Even when he considered a continuously growing economy, increased real savings were introduced not as a function of real income, but to force price-level reductions. The income/savings nexus was not fully developed.

We saw, through a discussion of Wicksell's passing remarks on economic crisis and his remarks on the unobservable nature of the natural rate, the importance of the natural rate in controlling the direction of the economy in Interest and Prices. We speculated on an expectational configuration that would leave the natural rate ineffective to restore a full-employment equilibrium. Our speculation was based essentially on asking how the economic actors experienced the force of the natural rate, and how they received the appropriate market signals, when the natural rate is unobservable and its repercussions on prices and profits have been inhibited. Wicksell remained committed to the natural rate, particularly the role it played in maintaining full employment, and importantly its explanatory power when faced with the quantity theory of money and its proportional price-level adjustments as a theoretically central or conceptually organizing principle.

Chapter Three was the first of two chapters on the Treatise; we used it as an introduction to its theoretical and institutional framework. We again saw the importance attached to the quantity theory

as an organizational principle. The fundamental equations were designed to reveal windfall profits and losses. The causal mechanism of change initiated by the existence of these profits and losses is the mechanism presented as being responsible for the quantity theory's proportionality between the price level and the money supply. The fundamental equations formalized and generalized Marshall's speculative trading profits and captured the motivating forces behind Marshall's and Wicksell's explanations of price-level trends.

Our discussion of normal entrepreneurial income in the Treatise's definition of earnings, as distinct from any part of windfall profits and losses, led to the conclusion that the Treatise's zero profit equilibrium condition was in keeping with a stationary-state or steady-state long-period equilibrium. Prices are equal to their cost of production in an economy that parallels that of Marshall's long-period stationary state. We further saw the problems that this view produced in the Treatise's description of savings, investment, and the natural rate, all defined relative to a long-period equilibrium at full employment. We suggested that this, in conjunction with Keynes' broad definition of capital and investment, created problems when Keynes turned to describe trade cycles using a mechanism, essentially a price mechanism, developed in the long-period context of the quantity theory.

We finally introduced the Treatise's description of financial markets. Bull and bear positioning led Keynes to develop an explicit and new role for the interest rate in mediating between lending activity and security-market activity. The traditional flows of the loanable-funds model had been expressly augmented to include stock

adjustments. This led Keynes, particularly in his indeterminant security-market configurations, to advocate central-bank intervention to maintain lending at the natural rate to ensure the full-employment level of investment. The Treatise's stock-flow discussion makes explicit Marshall's implicit reliance on stationary-state stock adjustment in his determination of the long-period equilibrium interest rate.

We presented Keynes' monetary theory of price-level trends, or monetary cycles, and demonstrated the central importance of the natural rate, and hence the stationary state, in determining the outcome of a monetary disturbance. It was in this context that we first raised the question of the stability of the natural rate, particularly in the context of income and profit deflation. In general, though, our presentation simply demonstrated the integration of the Treatise's components, highlighting price-level adjustment and market-rate adjustment relative to the cost of production and the natural rate respectively. We noted the requirement of a balance between bearish and bullish security-market sentiments, as well as the requirement of a balance between investment and savings. The discussion of savings, as we stated in Chapter Three, was insufficient; it did not mention nominal savings' dependency on nominal income, a requirement of his equilibrium and of the restoration of the market rate to the natural rate. Perhaps Keynes thought it is too obvious to mention.

In our discussion of the trade cycle we discovered that Keynes wanted to speak of a less-than-full employment equilibrium, but maintain the framework and concepts, or at least the terminology,

developed for the analysis of long-period full-employment price-level movements. We made use of our extended discussion of the trade cycle to emphasize the shifts in meaning of some key ideas found in the Treatise's framework, particularly the idea of normal entrepreneurial income and the natural rate. The less-than-full employment equilibrium caused us to reconsider both concepts. The natural rate, or its change, came to signify simply a change in the expected prospects from investment either in plant and equipment or in an increased level of output. The natural rate lost its connection to a full-employment stationary- or steady-state economy. The income enjoyed by entrepreneurs in an underemployment equilibrium with excess capacity we identified with that obtained when realized sales or prices meet entrepreneurial expectations, as in the Principles' notion of a short-period equilibrium when output is adjusted to the level of demand given fixed capacity. Our main justification for drawing this parallel between the Principles' short-period analysis and the Treatise's trade-cycle analysis was the emphasis that Keynes placed on one aspect of his definition of investment: a firm's goods-in-process decision. This, of course, left vague the influence of investment in plant and equipment on the equilibrium process. We found, in fact, a great muddle when we addressed the trade cycle's handling of the latter type of investment. Finally throughout our discussion of the trade cycle we noted Keynes' contrivances to force price-level adjustments and validate the quantity theory, a strategy in keeping with both Marshall's and Wicksell's concerns.

In the discussion of the collapse of the natural rate we used

Keynes' asides on the possibility of a cyclically dependent natural rate to raise the question of what factors determine firms' expected level of demand, and how the natural rate and the market rate might converge on a less-than-full employment economy. This led us to compare the setting of the Treatise's adjustment process to that of the General Theory's. We drew again on the Principles' analysis of the long-period and the short-period to draw a parallel between the trade-cycle analysis and the short-period analysis of the General Theory, but we found the parallel to be incomplete. Keynes never links changes in his cyclically dependent natural rate, his change-in-investment sentiments, in a consistent way with changes in the level of income or output. Interestingly, our discussion of a cyclically dependent natural rate and the determinants of demand raised questions whether the natural rate, as a uniform rate of profit, has any behavior-determining role in restoring the economy to equilibrium. In the latter we have reiterated our conclusions from our discussion of Marshall's and Wicksell's analyses of economic crisis.

The analysis of Chapter Four led us to reiterate the broad conclusion of the thesis. It was the quantity equation and Keynes' acceptance of it as a full-employment equilibrium condition that supported and motivated the time frame of the Treatise. It colored his explanations of price-level dynamics and focused his attention on them. Price levels were to be explained at the expense of a sound theory of output movements and savings behavior. Specifically, in the Treatise's trade cycle, consumption-goods production could not expand with the expansion in their demand; a period-of-production analysis focused

attention on price-level changes. In the trade cycle full employment was quickly reached, forcing market-rate changes. In the monetary cycle, the full-employment level of savings and the savings positions of bears forced market-rate changes. Both cases were seen to initiate price-level changes. The consequences of Keynes' asides on a cyclically dependent natural rate were not explored in the Treatise, leaving open the questions of where the economic system was grounded. Was it grounded in the potential full-employment level of productivity and thrift or in entrepreneurial expectations of prices, revenues, and demand? The assumption of full employment or a system that quickly restores full employment was amenable to facilitating price-level changes and viewing the world through the quantity equation.

In Chapter Five we have used the General Theory's critique of "classical" monetary theory to situate the General Theory's short-period equilibrium. The defining characteristic of this equilibrium was not simply that Keynes held plant and equipment constant, but that the long-period full-employment equilibrating force of the natural rate of interest found in "classical" writings has been uprooted. It has been transformed to the state of long-term expectations, and has become thoroughly dependent on short-period events, although for the sake of an analytical solution Keynes held the state of long-term expectations or the state of confidence constant.

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this exercise we reiterated the importance and fragile nature of investment expectations, and saw the importance Keynes attached to the multiplier and the principle of effective demand. It is clear that Keynes saw the latter two as equilibrating mechanisms competing with the traditional wage- and interest-rate flexibility mechanisms, and in many respects saw the classical mechanisms as disruptive to his less-than-full employment adjustment and, importantly, as inhibiting any equilibrium.

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> ...a more general theory, which includes classical theory...as a special case. Keynes (1936) p.xxiii.

He is referring to the "classical" monetary theories, like those of Marshall, Wicksell, and the Treatise. They represented the special assumption of full employment and a correspondingly stable set of long-term expectations. Keynes' theory of effective demand in conjunction with the multiplier took a first step toward an analysis of short-period phenomena. They formulated the organizing principles from which a theory of the trade cycle could be constructed without building in contrivances that would force the price-level changes required in the quantity theory tradition.

Appendix to Chapter Three

The parallels found between the Treatise and Interest and Prices have become apparent in Chapters Two and Three. To be fair to the reader's eventual judgment on Wicksell's influence, I will take a moment to survey opinions on this issue. The opinions range from the affirmative to the negative with expressions of doubt and reserved judgment in between them. Reserved judgment is perhaps the most judicious. Roy Harrod, in his biography of Keynes, remarks on the originality of the Treatise's "disparity between investment and savings":

> In this matter Knut Wicksell, to whom he [Keynes] paid tribute, came nearest to him; there is no doubt that the process of thought by which Keynes reached his conclusions was independent, and not derived from the study of Wicksell. Harrod (1951) p.409 my brackets.

Schumpeter shares this view [Schumpeter (1954) p.1119]. Richard Kahn, a student and then colleague of Keynes, states:

> The Treatise is closely associated in the minds of economists with the name of Wicksell...But I doubt whether his influence on Keynes amounted to much more than adopting his distinction between the natural rate of interest and the market rate. Kahn (1984) p.74.

It is interesting to note the lack of an emphatic negative in Kahn's remark and that he, as the translator of Interest and Prices, appears to have made the translation at Keynes' request [CWJMK Vol.XII, pp.862-865].[1]

The Swedish economist Bertil Ohlin, meanwhile, is quite positive in his statement.

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[1] See Dimand (1988 p.136).

> In my opinion there can be no doubt whatsoever about the considerable influence which Wicksell's theory about the relation between the normal rate of interest and the market rate, exercised on Keynes' thinking. I refer to Volume I of the Treatise...
>
> On 9 April 1929 I wrote to Keynes...My letter also contains the following passage: Professor Gregory told me that you had found Wicksell's old book Geldzins und Guterpreise [Interest and Prices] very valuable... Ohlin (1977) pp.149-50 my brackets.

The authority on British banking and bank policy R.S. Sayers writes in his discussions of the high interest-rate policy in 1920s Britain:

> ...Keynes soon got around to reading Wicksell, and by the end of the decade most of us had learned that [the] Bank Rate no longer depended on some magical scaring of lending banks but that its major operation was through its influence on the whole structure of interest rates. Sayers (1979) p.202 my brackets.

This is a reference to Wicksell's analysis of how a sustained bank rate or short-term interest rate will affect the bond rate.

In contrast to Ohlin and Sayers and in agreement with Harrod, D.E. Moggridge, biographer of Keynes and editor of his Collected Writings, remarks,

> In the Treatise, as well, the distinction between the "natural" and the market rate of interest made its appearance. Such a distinction, hinted at by Marshall, had existed in the work of Knut Wicksell...but the Treatise formulation seems to have...evolved independently of a knowledge of the literature. Moggridge (1976) p.79.

We might allow Keynes a final word. The Treatise cites Wicksell for an "outstanding attempt" at understanding the bank rate's effect on investment [Keynes (1930a) p. 167 pp.170-171 pp.175-178], but Keynes adds in a footnote when considering the "new-Wicksellian school" of Mises, Neisser, and Hayek that

> ...(in German I can only clearly understand what I know already! -- so that new ideas are apt to be veiled from me by difficulties of language). Keynes (1930a) p.178 fn.2.

We might take note that in CWJMK Vol.XI there are six early review articles written by Keynes of German-language texts in the fields of statistics and economics, including Mises' Theory of Money and Credit. A little before this footnote, Keynes identifies the movement of investment relative to savings with the names of Wicksell and Cassel and says that this sets in motion a change in prices via a change in profits or receipts [Keynes (1930a) p.171]. Several years later, in a letter dated June 16, 1937, to Gunnar Myrdal, Keynes states that he is "not aware" "whether he [Wicksell] also investigated what happens when they [savings and investment] are not equal" [CWJMK Vol.XXIX p.262]. A similar lack of knowledge of Wicksell's work expressed in a letter to Bertil Ohlin dated January 27, 1937 and Keynes later in a second response to Ohlin states that he does not know the "detail" of Wicksell's arguments [CWJMK Vol.XIV p.184, Keynes (1937) pp.241-242 fn.2]. These three statements of Keynes contradict much of what Keynes said in the Treatise about Wicksell. They do suggest, though, why such differences of opinion have arisen on Wicksell's influence. The temptation to voice an opinion will be resisted, if for no other reason than that we do not know when Keynes first read Wicksell.[2]

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[2] The Economic Journal published an article by Wicksell in 1907 where he summarized his theory of monetary cycles, but I can find no reference to this article in Keynes' writings. See Wicksell (1907).

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