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The Road to *The General Theory*: J. M. Keynes, F. A. Hayek, and the Genealogy of Macroeconomics

O Caminho para a General Theory: J. M. Keynes, F. A. Hayek, e a Genealogia da Macroeconomia

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It is argued that the road to *General Theory* was in part paved in the famous controversy between Friedrich A. Hayek and John Maynard Keynes in 1931.

ABSTRACT: The criticism made by Friedrich A. Hayek to *A Treatise on Money* by John Maynard Keynes, and the subsequent controversy that followed with the involvement of members of the Cambridge Circus, sustained important elements to Keynes' abandonment of his earlier ideas and to his way to *General Theory*. The figure and position of Hayek operated to clarify the underlying differences and the new theoretical routes for Keynes, one that was more explicitly opposite to critical authors drawing from Knut Wicksell. *To some degree*, the road to *General Theory* was paved in the famous 1931 controversy - in particular the rejection of the Wicksell connection.
Keywords: John Maynard Keynes, Friedrich A. Hayek, Knut Wicksell, *General Theory*, coordination.

RESUMO: A crítica feita por Friedrich A. Hayek ao *Treatise on Money* de John Maynard Keynes, e a subsequente controvérsia que se seguiu com o envolvimento de membros do Cambridge Circus, sustentou importantes elementos para o abandono por Keynes de suas ideias inicias e para o seu caminho para a *General Theory*. A figura e posição de Hayek serviram para clarificar as diferenças subjacentes e as novas rotas teóricas para Keynes, que viria a se tornar mais explicitamente oposta a autores que se baseavam em Knut Wicksell. O caminho para a *General Theory* foi pavimentado *em parte* na famosa controvérsia de 1931, em particular a rejeição da chamada conexão Wicksell.
Palavras-chave: John Maynard Keynes, Friedrich A. Hayek, Knut Wicksell, *General Theory*, coordenação.

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PROLOGUE: THE ENCOUNTER

One of the most famous controversies in the history of economic thought is certainly the profound and direct clash between Friedrich A. Hayek and John Maynard Keynes in 1931. On February 24, 1927, both men had their first correspondence. Hayek had requested Keynes a copy of Francis Y. Edgeworth's *Mathematical Psychics* (1881). Keynes answered briefly saying that the stock of the book was depleted. "I am very sorry to say that my stock of *Mathematical Psychics* is exhausted."[2] In July 1927, on the occasion the director of the recently founded Austrian Institute of Business Cycle Research, Hayek sent to Keynes the first issue of the publication made by the institute.[3]

In 1928, Hayek first met Keynes in London at an international conference organized by the London and Cambridge Economic Service, in which Keynes (along with Gerald Shove and Austin Robinson) represented Cambridge. Already in this meeting, Hayek and Keynes had their first strong disagreement on some aspect of "the effectiveness of changes in the interest rate" (Hayek, [1963] 1995, p. 59). Keynes was sixteen years older and had an established worldwide intellectual reputation as the most important contemporary British economist. Although Keynes "had a somewhat intimidating manner in which he would try to ride roughshod over the objections of a younger man," Hayek ([1966] 1978, p. 283) recalls, "if someone stood up to him he would respect him forever afterwards even if he disagreed."

In July 1928, Hayek sent Keynes a paper on which they had already discussed in London. It was a report dealing with the relation between monetary theory and business cycle prepared for the meeting of the *Verein für Sozialpolitik* held in Zurich in September 1928 (Hayek, [1929] 1933, p. 15). The expanded version of this report constituted Hayek's first book, *Geldtheorie und*

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[2] Friedrich A. Hayek's collection, Hoover Institution Archives.

[3] The Austrian Institute was founded in 1927 by Hayek (as its first director) along with the indispensable efforts and support of his ten years mentor, Ludwig von Mises. At the time, Mises was the chief economist at the Austrian Chamber of Commerce. In 1928, Oskar Morgenstern also joined the institute as Hayek's assistant - Mises was also Morgenstern's mentor. Both *alumni* were important members of the Mises Kreis (Mises's circle and private seminar) and of Geist Kreis (a circle founded by Hayek and other young students at University of Vienna). The Mises Kreis was a continuation of the famous advanced seminar of Eugen von Böhm-Bawerk that Mises, Joseph A. Schumpeter, Otto Neurath and others attended. After Hayek's departure to England in 1931, Morgenstern served as the director of the institute until 1938 (when the Nazis occupied Vienna), where he also employed Abraham Wald.

Konjunkturtheorie (1929) (*Monetary Theory and the Trade Cycle*, 1933). Hayek also sent the book, recently published in German, to Keynes in early 1929. In March 26, 1929, Keynes expressed gratitude to Hayek for sending the book and noted that the last chapter on the "Unsettled Problems of the Trade Cycle Theory" especially interested him. However, Keynes complained that Hayek's German was "dreadfully hard to make out!"[4]

Keynes' views in *A Treatise on Money* (1930) were very different from *The General Theory*. The critical reaction that Keynes faced soon after the publication of *Treatise* in the late 1930 by his younger colleagues at Cambridge (the Cambridge Circus) and by others such as Dennis Robertson, Arthur Cecil Pigou, and Hayek was essential to the revision and development of the ideas that would lead to his *magnum opus*. The decisive influence of the Circus, especially in the figure of Richard F. Kahn, was particularly instrumental to Keynes in, paraphrasing his own preface in *Treatise*, the intellectual "process of getting rid of the ideas which I used to have and of finding my way to those that I now have" (Keynes, [1930] 1971, p. xvii).

However, the intellectual and historical context in which these many influences occurred is not very discussed, in special the interrelations connecting the different protagonists. Hayek as an intellectual *persona* inserted in this context has been largely ignored. In this essay, we intended to remedy this situation. In part, numerous ideas that would be pivotal to the anatomy of *General Theory* were developed in the environment of Keynes' famous controversy with Hayek. The clash with Hayek in 1931 contributed to a sort of catalysis atmosphere to many sources of influence in Keynes' thinking. Hayek was a specimen of common antithesis for Keynes and the Circus. It clarified Keynes' own distinctive approach and new ideas - as it clarified Hayek's own thoughts. Such ideas were already present and implicit in Keynes' policy recommendations, such as in the 1929 pamphlet "Can Lloyd George Do It?", but they lacked a complete theoretical foundation.

Hayek's main critique is the lack of capital theory in Keynes' attempt to construct a theoretical scheme based on the Swedish economist Knut Wicksell. This critique was important to Keynes' abandonment of his hitherto ideas and for the development of a new aggregate income determination theory (in contrast to a price-level theory as in *Treatise*). Moreover, it is within

[4] "Many thanks for sending me a copy of your book. I have been particularly interested in the last chapter. But I find your German dreadfully hard to make out!" (Keynes to Hayek, March 26, 1929, Hayek's collection).

Sraffa's critique of Hayek's business cycle theory that a great part of Sraffa's influence traveled and permeated to Keynes. Sraffa's critique of the Wicksellian natural rate of interest in his controversy with Hayek was crucial to Keynes' rejection of his earlier views. Keynes used Sraffa's critique as an important element to the liquidity-preference interest theory and in the rejection of a long-run equilibrium state. The road to *General Theory* was paved *to some extent* in the famous controversy between Hayek and Keynes and its consequences in the milieu of the 1930s.

THE INTELLECTUAL AND HISTORICAL MILIEU OF THE CONTROVERSY

Two years later after the first meeting between Hayek and Keynes, Hayek was invited by Lionel Robbins to give four advanced lectures at the London School of Economics (LSE) in the lent term of 1930-1. Robbins was impressed by Hayek's ideas on "The Paradox of Savings" ([1929] 1931a). The paper was a critique of very influential pre-Keynesian American underconsumption theories of William Trufant Foster and Waddill Catchings in the 1920s. Hayek had entered in contact with this thesis when he was on his United States trip in 1923-4, probably in Wesley Claire Mitchell's "Types of Economic Theory" class. Robbins was acquainted with the Continental economic literature and he saw the critique as also properly suited against Keynes' attempt to structure a monetary theory variant of the underconsumption conjecture for England in the post-war period. Keynes was expressing and developing his views in both the Macmillan Committee on Finance and Industry and the Committee of Economists of the Economic Advisory Council, the second in which Robbins also was a member (invited by Keynes). In the autumn 1930, Robbins had his famous row with Keynes on policy recommendations for the depression in the Committee but, as Susan Howson (2001, p. 370) noted, the invitation and acceptance for the lectures by Hayek occurred before this public disagreement.[5] The four lectures were announced in the LSE calendar

[5] The row between Keynes and Robbins was a result of Robbins' refusal to sign the Committee's report proposing tariffs on imports. Keynes, once a long-time internationalist and free-trade advocate, proposed protectionist measures to alleviate unemployment for the first time in summer 1930 and did it publicly in March 1931. In Keynes' perspective, tariffs were the only measure available to preserve the gold standard since he considered the abandoning of the standard politically inviable. In September 1931, the standard was finally abandoned and Keynes revised his support for import tariffs.

for the period of 1930-1, delivered in January 1931, and early collected and published as *Prices and Production* (1931b) in September 1931.

At the beginning of the twentieth century, British academia was dominated by the influence of Alfred Marshall. Within the Marshallian dictatorship, the British economic profession was relatively closed to foreign influences. "Theoretical innovations, imported or otherwise, were rather a waste of time; it was all in Marshall," as Terence Hutchison (1955, p. 13) put it paraphrasing the famous *dicta* of Pigou. It is understandable that the lectures given by Hayek were received in an almost incomprehensible way but also with curiosity and some kind of fascination. The first sentiment is lively expressed by the reaction of the young Cambridge economists to the seminar that Hayek gave at Cambridge in 1931 (cf. Kahn, 1984, p. 184; Robinson, 1978, pp. 2-3).

With the refusal of Jacob Viner in February 1931 to take the long-vacant Tooke Chair at LSE, Hayek was invited in April to take a visiting position using the Chair. After two terms, in 1932, the Tooke Chair was offered permanently to Hayek. Before Hayek being appointed to the visiting position, Robbins charged him to do a review of *A Treatise on Money* (1930) by Keynes, published in late October 1930, for *Economica*. The *Treatise* was an attempt to build a monetary theory of savings and investment drawing from Wicksell ([1898] 1936, [1901] 1934) within the underconsumptionist substructure. It was supposed to be a definitive statement on monetary theory that would solidify Keynes' position as an authoritative scholar, complementing his position as a public intellectual. It was a sort of theoretical skeleton for many of Keynes' policy recommendations for Britain in the 1920s.

Keynes started to work on the book in July 1924, soon after the publication in the end of 1923 of the *Tract on Monetary Reform*, in which his analysis was dominated by the quantity theory of money. At the same time, Robertson started to work on his *Banking Policy and the Price Level* (1926), the first book to introduce in Cambridge the distinction between savings and investment. As Keynes ([1936] 1973, p. 94) wrote to Robertson in 1936, "I certainly date all my emancipation from the discussions between us which preceded your *Banking Policy and the Price Level*." Keynes hoped to publish the *Treatise* in 1927. Indeed, in the same day Keynes (1973, p. 176) finished the book, he wrote to his mother. "Artistically it is a failure - I have changed my mind too much [...] for it to be a proper unity."

The historical context in which Keynes was inserted is important to understand his aspirations with the *Treatise*. The period that started with the end of the First World War and the culmination of the Great Depression in Britain was the milieu in which Keynes acted in response to. This was period marked by chronic high unemployment rates and deflationary pressures - partly as result of structural adjustments after the war. British exports and financial protagonism were rapidly deteriorating. Since the end of the Great War, Keynes noted, the expected returns to new investments were in a systematic declining term. Because of the war effort, this return had been remarkably high.

In 1925, the British treasury in the hands of Winston Churchill decided to return to the gold standard abandoned in the war. The rate proposed was the old pre-war parity (£1=$4.86). In the war period, there were naturally inflationary tendencies and real devaluations pressures. Moreover, Britain was losing importance in foreign markets. Since the initial decades of the century, British exports dominance had been damaged by increasing foreign competition and the dislocation of the center of global finance and commerce to the United States. In this context, to return to the pre-war parity implied that an overvalued exchange rate was to be maintained. The general price level had to fall in relation to gold by higher interest rates and wages (and income) downward adjustment.

The combination of savings without proper domestic investment opportunities, the return to the gold standard, and higher interest rates caused a stagnant economic picture with high unemployment rates in Britain for all the 1920s decade. The depression in the 1930s seemed just a prolonged and intensified agony that Britain already experienced in the previous years, in contrast to the Roaring Twenties in the United States. All these factors favored an underconsumption approach to business cycles. In Keynes' view, because of the political inability to abandon the pre-war gold parity, monetary policy was not an option. Only short-run fiscal policies, such as a large program in public works, could alleviate the monetary causes of the economic discoordination.

The translation of "The Paradox of Savings" from German to English by Nicholas Kaldor and Georg Tugendhat was published in *Economica* in May 1931.[6] The first part of Hayek's review, "Reflections on the Pure Theory of Money of Mr. J. M. Keynes" (1931c), was published in August, untimely followed by a reply by Keynes (1931) and a rejoinder by Hayek (1931d) in November. The second part of the review that was planned to be published in November 1931 only appeared in February 1932 (Hayek, 1932a). As well as Keynes, Hayek was trying to construct a business cycle theory drawing from Wicksell. However, the main theoretical component in his theory was the heterogeneous structure of capital, reminiscence of the Austrian tradition of Carl Menger, Eugen von Böhm-Bawerk, and Ludwig von Mises. Wicksell ([1893] 1954) was especially influenced by Böhm-Bawerk and one of his first theoretical attempts was to make compatible the marginal productivity theory and Böhm-Bawerk's capital theory within a general equilibrium framework. After this attempt, Wicksell ([1898] 1936) went on to build his cumulative process.

In *Theory of Money and Credit* ([1912] 1934), Mises manufactured to combine the Wicksellian cumulative process with movements in the heterogeneous capital structure into a business cycle theory, on what is called Austrian Business Cycle Theory (see the first lecture in Hayek, 1931b). Mises' theory states that deviations of the market interest rate (determined in the monetary market, actually observed) from natural interest rate (a hypothetical rate that equilibrates savings and investment in real terms) by long periods induce distorted investments in the structure of capital. If the money rate is persistently lower than natural rate, the production of higher orders goods (more capital intensive, with greater roundabout production methods) will be encouraged. Capital and labor will move from lesser capital-intensive methods of lower production orders to greater capital-intensive methods. Nevertheless, this state of things cannot endure forever. At some point, the cumulative process will reveal the shortage of capital and consumption goods in lower orders. Hence, the money interest rate is to be increased and the previous investments made will have to be reviewed. This process liquidated some productive real investments, causing capital consumption and real income loss.

[6] Kaldor also translated, with H. M. Croome, *Monetary Theory and the Trade Cycle* ([1929] 1933). To qualify for the *Habilitation*, Hayek had to write a book. This was the result. The subject of his public defense to *Privatdozent* was "The Paradox of Savings."

The money market is in equilibrium when the market and natural rates are equal. This is only possible when savings and investment are also equal, i.e., when the loanable funds (goods) market is also in equilibrium. On the one hand, it is a monetary equilibrium in the sense of price level stability absent productivity gains and money neutrality. On the other hand, it is a real equilibrium in the sense of consistency of intertemporal consumption preferences with the capital structure. Mises and Wicksell were the benchmarks in which Hayek developed his own theory of industrial fluctuations.[7]

THE WICKSELL CONNECTION: KEYNES, HAYEK, AND A GENEALOGY OF MACROECONOMICS

As a result, the *mise-en-scène* of the controversy between Hayek and Keynes was that both were trying to develop their own business cycle theory drawing from Wicksell. Yet both derived antagonist propositions in relation to the other. In the *Treatise*, Keynes used his Fundamental Equations for the value of money (a modified version of the quantity theory in the *Tract*) and the cumulative process as a thread in which savings and investment determined the price level, implicitly taking income as a given. In his Fundamental Equations equilibrium, (i) savings are equal to investment and (ii) there are no entrepreneurial windfall profits or unexpected losses. Keynes defined savings as revenue minus expenses plus a normal income of entrepreneurs. With unexpected profit deflation, entrepreneurs have to finance their losses in the securities market or they must reduce their own consumption. In either way, savings are determined to be above investment. The Wicksellian cumulative process allowed Keynes to discuss in more detail and deepness the interrelations of interest rates in a modern banking and credit economy. His old Cambridge quantity theory did not offer these elements.

[7] Wicksell narrowed the cumulative process only to price level determination. Wicksell's business cycle is concerned with real factors associated with increasing population and scarce natural resources around the dynamic equilibrium path induced by technological progress (see Boianovsky, 1995). However, his writings on how the cumulative process influenced relative prices and thus on real maladjustments allocations are ambiguous regarding the desirability of this integrative effort. Nevertheless, Wicksell was skeptical on the use of short-run cumulative processes within a theory based on the misallocation of capital induced by relative price distortion.

Keynes used this relatively simple theoretical framework to structure his policy diagnosis regarding British economic affairs in the 1920s. In Keynes' vision, the money rate was above the natural rate and this was expressed by the longtime of chronic unemployment and income deflation. Keynes integrated Wicksell's cumulative process and his Cambridge-based Fundamental Equations under the underconsumption (or oversaving) diagnosis. By his turn, Hayek integrated Wicksell in line with the Austrian capital theory. In this case, there is a natural tendency for banking and credit systems to expand in booms and cause overinvestment in busts since there is a capital structure that cannot be supported after the money rate inevitably rises. Hayek was especially thinking on the American experience in the Roaring Twenties that he saw in his 1923-4 trip. It is a cycle in the sense that divergences between money and natural rates encourage the creation of *wrong* (not only *more*) types of capital goods that are not compatible with the intertemporal preferences of consumers.

Indeed, both theories are based on the role of interest rate as the (dis)coordination element in the incentive to save and invest throughout time. Coordination failures between market and natural rates produce output fluctuations. There may be no automatic correcting mechanism that guarantees full employment in a monetary economy of production. This (macro)coordination problem theme in an expectation, capital theoretic, and monetary economy was called by Axel Leijonhufvud (1981) as the "Wicksell connection."

As pointed out, the British academia at the time was insulated from the various developments in economic theory at the Continent. These include German and Austrian Schools, French and Italian theorists of Lausanne School, and the Swedes of Stockholm School. Continent authors only began to be translated into English in the 1930s, mainly by the initiative of Robbins. Wicksell is one of these authors. At the time of the controversy between Hayek and Keynes, Wicksell's works were available only in the original language, mostly German. In his early work on *Value, Capital, and Rent* ([1893] 1954), Wicksell draws from Böhm-Bawerk's capital theory and sustains a close relationship between the natural interest rate and the marginal productivity of capital determined by the capital roundaboutness (see especially the second part of the book). The book was reprinted in German in 1933 by the LSE as number 15 in the Series of Reprints of Scarce Tracts in Economic and Political Science, but only was translated to English in 1954.

Another example, *Interest and Prices* ([1898] 1936), a relevant influence on Keynes' *Treatise,* was only translated into English by Kahn with a foreword by Bertil Ohlin in 1936. In this book, Wicksell tried to conciliate the quantity theory of money with marginal utility theory, the so-called classical dichotomy. Marginal utility explains only the relative price structure in an economy, which is a function of the equality of subjective and objective marginal substitution rates. On the other hand, the quantity theory only explains the nominal price level as a function of monetary supply, real income, and money velocity of circulation. However, quantity theory does not explicitly state the causal mechanism chains in which the money supply changes the price level. As Keynes ([1930] 1971, p. 120) put it, the quantity theory is ill adapted for explaining "the causal process by which the price level is determined." Wicksell introduced the notion of individuals' real cash balances linking the commodity and monetary markets. An increase in money supply makes individuals' real cash balances, determined by the marginal principle, higher than the real optimum desired level. An increase in money spending is realized in order to bring the real cash balances back to the individuals' level preference. By this process, Wicksell imagined that changes in money supply have in general a neutral impact on relative prices since the marginal substitution rates would remain the same.

After Wicksell's *Interest and Prices*, it was Mises (1912) the more robust, systematic, and influential work in monetary theory in the early century. Mises also were only available to Keynes in German. Mises diverged with Wicksell on the disproportionate impact of changes in money supply to relative prices and distributional income. This was a reaffirmation of Richard Cantillon's view that the route in which the new monetary supply enters in the economy is important and affects the relative price structure (the marginal substitution rates) and individuals' endowments. Thus, it can also affect the capital structure composition. The result is the integration of cumulative process and the Austrian theory of capital in a monetary induced - but real based - business cycle theory. Even in a pure credit economy, the expansionary cumulative process has real limits in the distorted productive factors. A continuous expansion can only be maintained with increasing inflation toward hyperinflation, as the Austrian experience in the 1920s.

Interestingly, Keynes ([1930b] 1971, p. 178) in a footnote in the second volume of *Treatise* regretted that he had not benefited more from the Continental literature due to his difficulty with the German language.

> "I should have made more references to the work of these [German] writers if their books, which have only come into my hands as these pages are being passed through the press, had appeared when my own thought was at an earlier stage of development, and if my knowledge of the German language was not so poor (in German I can only clearly understand what I know already! — so that new ideas are apt to be veiled from me by the difficulties of language)." [8]

Keynes ([1930] 1971, p. 154) also discuss the similarity of his distinction between savings and investment and its central importance to his theory in comparison to the German contemporary literature. Following the authority of Albert Hahn and Joseph Schumpeter, he mentions Mises (1912) as the first author to introduce this distinction in the German literature. Keynes ([1930] 1971, p. 178) notes the influence of a German and Austrian "neo-Wicksell school, whose theory of bank-rate in relation to the equilibrium of Savings and Investment, and the importance of the latter to the Credit Cycle, is fairly close to the theory in this *Treatise*. I would mention particularly Ludwig Mises's *Geldwertstabilisierung und Konjunkturpolitik* [*On the Manipulation of Money and Credit*, 2011] (1928)."

Moreover, Keynes refers to Hans Neisser's *Der Tauschwert des Geldes* (1928) and Hayek's *Geldtheorie und Konjunkturtheorie* (1929). Surprisingly, or not, in 1930 Keynes saw a remarkable convergence between his theory and Mises' work. In particular, the Wicksellian heritage that

[8] This does not mean that Keynes had no knowledge or could not read at all in German (e.g., Moggridge, 1992, p. 172). The point is that the crucial relevant literature in dispute was somehow lacking to Keynes. Hayek ([1966] 1978, pp. 284-5) stressed this point: "Widely read as Keynes was in many fields, his education in economics was somewhat narrow. He did not read any foreign language except French - or, as he once said of himself, in German he could understand only what he knew already. It is a curious fact that before the First World War he had reviewed L. von Mises' *Theory of Money* for the *Economic Journal* (just as A. C. Pigou had a little earlier reviewed Wicksell) without in any way profiting from it. I fear it must be admitted that before he started to develop his own theories, Keynes was not a highly trained or a very sophisticated economic theorist." Fritz Machlup (1974, p. 10) also reminds this *mea culpa* in relation to Keynes' (1914) critical *blasé* review of Mises saying that "you can see how difficult it is to recognize originality when one cannot read the language in which it is expressed!" In the same vein, Lachmann (1983, p. 379) comments that "[w]hen writing these lines Keynes must have forgotten his earlier review of Mises's book." Some years later, Mises (1927) reviewed *The End of Laissez-Faire* (1926). Mises' book was only translated to English in 1934.

emphasizes the coordination of savings and investment by the interest rate and the central role of investment volatility during the business cycle. In addition, *prima facie*, Keynes had forgotten his early *blasé* review of Mises' book (Keynes, 1914). Indeed, as Gunnar Myrdal ([1933] 1939, pp. 8-9) wrote in a book edited by Hayek (1933), reflecting Hayek's feelings regarding Keynes and Wicksell,

> "The English school of theorists has only slowly arrived at Wicksell's statement of the problem. J. M. Keynes' new, brilliant, though not always clear, work, *A Treatise on Money*, is completely permeated by Wicksell's influence. Nevertheless Keynes' work, too, suffers somewhat from the attractive Anglo-Saxon kind of unnecessary originality, which has its roots in certain systematic gaps in the knowledge of the German language on the part of the majority of English economists."

Kahn (1978, p. 552) commenting this passage stated that "[t]he truth seems to lie closer to the implications of [...] Myrdal's phrase 'systemic gaps in the knowledge of the German language' than to that of his phrase 'completely permeated." Still, Keynes "regarded Wicksell's book as sufficiently important for me [Kahn] to translate." In his 1937 response to Ohlin, Keynes gives us a hint on these points. Keynes (1937b, p. 242) considers "Mr. Hawtrey as my grandparent and Mr. Robertson as my parent in the paths of errancy," i.e., both had "strayed from the fold" of quantity theory before, "and I have been greatly influenced by them. I might also meet Prof. Ohlin's complaint by adopting Wicksell as my great-grandparent, if I had known his works in more detail at an earlier stage in my own thought and also if I did not have the feeling that Wicksell was trying to be 'classical.'"

This detour is important because Hayek's main critique of the *Treatise* is that Keynes did not incorporate the microeconomic capital theory foundations of Wicksell's early work, i.e., the capital theory of Böhm-Bawerk. Keynes had used the Wicksellian cumulative process without struggling with the microeconomic aspects of this theory. In Hayek's ([1966] 1978, pp. 284-5) opinion, Keynes' "ideas were rooted entirely in Marshallian economics," and what "had been achieved by [Léon] Walras and [Vilfredo] Pareto, the Austrians and the Swedes, was very much a closed book to him." Keynes "had ever thought systematically on the theory of capital," even of English Classicals such as John Stuart Mill and the marginalist developments of William S. Jevons.

THE CONTROVERSY BETWEEN HAYEK AND KEYNES ON THE *TREATISE ON MONEY*

The discussion above is illustrated by Hayek's very critical account on Keynes' definition of investment and profits. The notion of windfall profits or unexpected losses is centered on the general average entrepreneurial profit or losses, but Hayek (1931c, p. 277) argues that these gains or losses depend fundamentally on the relative price movements along the production structure. Keynes' approach only permits to treat these variables in aggregate terms but the analysis of what makes investment more or less attractive in a specific situation in the production stage is necessary to the description and explanation of the phenomena. Therefore, Hayek notes, a true explanation of investment can "only be reached by a close analysis of the factors determining the relative prices of capital goods in the different successive stages of production." The difference between these prices is the source of the cycle. Keynes' focus on aggregate concepts such as the total factors of production, total profits, and the general price level excluded in principle the frame of heterogeneous capital goods and relative profits. It "conceal[s] the most fundamental mechanisms of change" in capital complementarity or substitutability in such structures.

In Hayek's (p. 278) view, Keynes started a complex analysis of the dynamic investment processes in a monetary economy without a solid static analysis of the fundamental relative price movements. "All this would do no harm if his analysis of this complicating moment were based on a clear and definite theory of capital and saving developed elsewhere, either by himself or by others. But this is obviously not the case.' This difficulty appears more profound when Keynes introduced the Wicksellian cumulative process since "[i]n Wicksell's system these are necessary outgrowths of the most elaborate theory of capital we possess, that of Böhm-Bawerk. It is *a priori* unlikely that an attempt to utilise the conclusions drawn from a certain theory without accepting that theory itself should be successful" (p. 279).

According to Hayek (1931c, pp. 279-80), although Keynes systematically ignored the capital theory literature and never struggled seriously with capital micro-foundations, he seemed to realize that some work in this theme was necessary and "he sat to work one out for himself" in volume two of the *Treatise*. Keynes developed at least a part of the required theoretical foundation as he

ironically "discovers a new certain essential elements of Böhm-Bawerk's theory of capital, especially what he calls [...] the 'true wages fund' and earlier Böhm-Bawerk's formula for the relation between the average length of the roundabout process of production and the amount of capital." "Would not Mr. Keynes have made his task easier if he had not only accepted one of the descendants of Böhm-Bawerk's theory, but had also made himself acquainted with the substance of that theory itself?"

The review by Hayek led to a quick response by Keynes not only countering the points raised but mainly attacking Hayek's own theory developed in *Prices and Production*. Keynes (1931, p. 394) accepted the critique that a development of the theory of capital "would be highly relevant to my treatment of monetary matters and likely to throw light into dark corners." Keynes (ibid.) went so far as to admit that

> "[i]t is very possible that, looking back after a satisfactory theory has been completed, we shall see that the ideas which Böhm-Bawerk was driving at, lie at the heart of the problem and that the neglect of him by English pre-war economists was as mistaken as their neglect of Wicksell. But there is no such theory at present, and, as Dr. Hayek would agree, a thorough treatment of it might lead one rather a long way from monetary theory. Nevertheless, substantially I concede Dr. Hayek's point."

Later on, in *General Theory* ([1936] 1973, p. 176), Keynes reaffirms the soundness of the Marshallian tradition of given and fixed homogeneous capital as exposed by Frank Knight (1934) in contrast to the "useless of the Böhm-Bawerk analysis." The discussion between Hayek and Keynes was affected by contrasting definition of concepts. Hayek disagreed fundamentally with the conclusions of Keynes' theory, but the clashing of different intellectual traditions made it difficult to demonstrate the exact point of disagreement. Hence, Keynes (1931, p. 387) argued that Hayek's complaint of the language and definitions was a rhetorical strategy "to discovering some verbal contradiction or insidious ambiguity."

The main point in the controversy seems to be that, in Keynes' interpretation, savings and investment are very likely to processes of discoordination by monetary *and* real factors. In the case of the real factors, this is so because of the uncertainty on the savings and investment rates, made by different person with different objectives, in particular by the volatile preferences of

entrepreneurs. Keynes seems to accept that the natural interest rate makes the ultimate steady-state equilibrium. However, there is no guarantee in the short-run of this price-mechanism coordination to lead to full-employment. The price mechanism corrective properties cannot be trusted as an efficient instrument to intertemporal coordination.

In Keynes, there is no place for intertemporal coordination by interest rate in relation to the capital structure length and consumers' intertemporal preferences. The analysis is concentrated on the notion of unexpected aggregate entrepreneurial profits or losses. Disequilibrium between savings and investment not only can exist with alterations in monetary and banking features but also within alterations of real decisions of consumers and entrepreneurs on savings and investment rates even when the quantity of money is unaltered by the banking system. That is, disequilibrium properties can emerge caused by real decisions that modify the natural rate. Keynes focused in many sections of his book on why his Fundamental Equations did not capture the real processes that implied intertemporal discoordination features, such as the role of expectations in financial markets.

Even with no changes in money and credit supply, Keynes (1931, p. 393) argued that savings and investment can and indeed do get out of "gear without any change on the part of the banking system from 'neutrality' as defined by Dr. Hayek, merely as a result of the public changing their rate of saving or the entrepreneurs changing their rate of investment, there being no automatic mechanism in the economic system (as Dr. Hayek's view would imply there must be) to keep the two rates equal, provided that the effective quantity of money is unchanged."

In Hayek's (1931c, pp. 401-2) note in rejoinder to Keynes' early response, he focused on this point of disagreement. In his view, Keynes' denial of any interest rate role as a coordination mechanism in the loans funds market can be extended to the general level contention that there is no such (price coordination) mechanism in any relevant market in the economic system. Keynes ignored the "fundamental non-monetary problems of capitalistic production," which is intrinsically connected with capital theory. Keynes accepted that his theory has no satisfactory theory of capital and that it is important for monetary theory. However, Hayek (ibid.) contends, "even if we have no quite satisfactory theory we do at least possess a far better one than that on which he is content to rely, namely that of Bohm-Bawerk and Wicksell. That he neglects this theory, not because he thinks it is wrong, but simply because he has never bothered to make himself

acquainted with it, is amply proved by the fact that he finds unintelligible my attempt to develop certain corollaries of this theory."

A major neglected point in Hayek's (1932a, p. 29) second part review is his critique of Keynes' implicit assumption of fixed output in a deflationary scenario. This is, perhaps, the main contradiction of the *Treatise*. The question is "whether an excess of saving over investment in Mr. Keynes' sense, caused by a part of savings being used to cover losses [...], will cause total incomes to fall below total cost of production." The answer is negative since Keynes assumed that the output was to remain constant. Keynes' entrepreneur, despite making losses, continues to produce the same output of investment goods as before. Investment remains constant and savings increase to compensate for the unexpected entrepreneurial losses. This is so only due to the peculiar definition of savings as including normal profits. If output is to be constant, entrepreneurial profits will remain below to the normal and savings must increase in Keynes' definition.

> "The most curious fact is that, from the outset, all of Mr. Keynes' reasoning which aims at proving that an increase in saving will not lead to an increase in investment is based on the assumption that, in spite of the decrease in the demand for consumption goods, the available output is not reduced; this means, simply, that he assumes from the outset what he wants to prove." (ibid., p. 31)

It was difficult for Hayek to conceive a Wicksellian-based theory without stressing the decisive role of the interest rate as a price mechanism in the coordination of savings and investment through time. In the preface for the German edition of *Treatise* in late 1931, Keynes ([1930] 1971, p. xxiv) criticized Hayek's doctrine of forced-savings. Nevertheless, the incongruences and differences seemed so great that Keynes did not respond to the second part of the review by Hayek. There would be no reason to do it. Keynes was already abandoning the theoretical edifice of the *Treatise*.

THE ABYSS YAWNS: SRAFFA ENTERS INTO THE CONTROVERSY

Hayek and Keynes exchanged several letters between July 1931 and February 1932 concerning the review and the subsequent controversy. Keynes expressed his ambivalent sentiments on the correspondence exchange with Hayek in a letter dated February 1, 1932, to Kahn and Sraffa. "What

is the next move? I feel that the abyss yawns—and so do I. Yet I can't help feeling that there *is* something interesting in it" (Hayek, 1995, p. 172). Indeed, the exchange did not prove to be fruitful and Keynes finally closed the dialogue on March 29, 1932, saying that he doubted that he would reply to the second part review. "I am trying to reshape and improve my central position, and that is probably a better way to spend one's time than in controversy" (p. 173). Already in the end 1931 Keynes had begun to profoundly reappraise and reconstruct his theoretical structure.

Furthermore, Hayek had a correspondence dating from June 1931 with Kahn in relation to the *Treatise*, thus before the publication of Hayek's review. In this period Kahn (1931) published his important paper on the role of the multiplier and was critically working on Keynes' Fundamental Equations. The points that Hayek raised were on "the definition of profit and losses, definition of savings, the legitimacy of using aggregate variables, and in particular the price level, the various and contradictory definitions of consumption and the theory of capital" (Ingrao and Ranchetti, 2005, p. 384). The important point is Kahn's response to the definition of savings. Kahn argued that savings, defined in the usual sense as an excess of receipts over expenditure (opposed to Keynes' peculiar definition), "must necessarily adapt to the volume of the current production of investment goods," that is, "savings_u=value of investment" (ibid., p. 385). This notion of causality of current investment to savings *ex post* - i.e., income being the variable of adjustment between savings and investment (in contrast to the rate of interest) - will be central in Keynes' *General Theory*.

Meanwhile, after his rejoinder in the pages of *Economica*, Keynes - the editor of the *Economic Journal* - had convened Sraffa (1932a) to do a review of *Prices and Production*. The review appeared in March 1932 with a reply by Hayek (1932b) and a rejoinder by Sraffa (1932b) in June. Sraffa first proposed the Cambridge Circus - where he was a prestigious member. The Circus began to meet to discuss the *Treatise* a few weeks after its publication, around November 1930, and took place until May 1931. Sraffa along with the four other members of the Circus - Joan and Austin Robinson, James Meade, and Kahn - studied carefully the *Treatise* and helped Keynes directly with the formulation of a new theory of aggregate income determination in *General Theory*. Khan was the messenger and intermediator between Keynes and discussions of the group.

Around June 1931, the influence of Kahn and the Circus was already starting to be visible in Keynes' Harris Foundation lectures.

The choice by Keynes of Sraffa was not by chance. He was a young but established Cambridge figure that came to England in 1927 as a political refugee brought by Keynes. Sraffa knew the Continental economic literature in dispute, particularly Böhm-Bawerk and Wicksell.[9] Sraffa's main critical points regarding Hayek's book were on the internal logical consistencies, especially the inflation effects on compulsory savings and thus the new equilibrium *ex post* forced savings and the notion of a natural interest rate in a dynamic economy. First, Sraffa (1932a, 1932b) argued that there is no qualitative difference between e*x ante* voluntary savings and forced savings *ex pos*t. There is an isomorphism in both processes since the *ex post* savings is also *de facto* savings. The difference is only in terms of distributional nature, from which people the savings will be generated. In his view, there is no qualitative difference between voluntary or forced saving if the process of transition to a new structure of production is completed. If we think of forced savings process in an economy with general unemployed resources, the point is particularly suitable since the income adjustment is not constrained.

Sraffa's argument resumes Kahn's reasoning that the savings adjust *ex post* to current investment. If it is assumed that the capital structure of production is homogeneous as Sraffa seems to assume (and that Keynes explicitly will assume), then the question of a supposed traverse is not placed. Of course, the main argument of Hayek's (1932a, p. 239) theory is that the capital structure is not a homogenous mass and he was ready to accept that "it is upon the truth of this point that my theory stands or falls." However, in a context where there are general unemployed resources of *all* factors of production (i.e., full *un*employment), Hayek ([1966] 1978, p. 285) states that "an increase of the demand for consumers' goods *will* lead to an increase in investment. But Keynes assumes that this will always be the case."

[9] Sraffa translated *The Tract on Monetary Reform* into Italian, published in 1925. In addition, he also served as a kind of foreign editor and adviser to the publication of *A Treatise on Money* and *The General Theory* into Italian and French.

Second, Sraffa (1932a, p. 49) argued that the natural rate of interest is a vague and empty concept outside the long-run equilibrium state because once out of equilibrium there would be many natural rates as there are commodities.

> "If money did not exist, and loans were made in terms of all sorts of commodities, there would be a single rate which satisfies the conditions of equilibrium, but there might be at any one moment as many 'natural' rates of interest as there are commodities, though they would not be 'equilibrium' rates. The 'arbitrary' action of the banks is by no means a necessary condition for the divergence; if loans were made in wheat and farmers (or for that matter the weather) 'arbitrarily changed' the quantity of wheat produced, the actual rate of interest on loans in terms of wheat would diverge from the rate on other commodities and there would be no single equilibrium rate."

Sraffa denied the assumption that there is one natural equilibrium interest rate in a barter economy. Therefore, Hayek's theory of divergences between the money and natural equilibrium rates is weaken. As is Keynes' *Treatise*. In a moneyless world, Sraffa asserted, in equilibrium the spot and forward price of each commodity coincide but if, for any reason, the supply and demand for any commodity are not in equilibrium (due to the gravitation of market prices toward their normal or natural prices), "it spot and forward prices diverge, and the 'natural' rate of interest on that commodity diverges from the 'natural' rates on the other commodities." Thus, out of the long-run equilibrium rate, in a divergence between monetary and natural interest rates, there are many natural rates as there are commodities.

These changes out of the long-run equilibrium natural rate apply as much to an increase of savings "as to changes in the demand for or the supply of any other commodities." That is, Sraffa (1932a, p. 51) seems to argue that either an increase of savings or a change in investment inevitably changes the demand and supply of different commodities and thus changes their own natural rate of interest (i.e., there are multiple equilibrium rates). In "times of production expansion, due to addition to savings" and in which constantly the nature rates of commodities are changing, "there is no such thing as an equilibrium (or unique natural) rate of interest, so that the money rate can neither be equal to, nor lower than it: the 'natural' rate of interest on producers' goods, the demand

for which has relatively increased, is higher than the 'natural' rate on consumers' goods, the demand for which has relatively fallen."

Sraffa (1932a, p. 51) noted that this criticism is not applied to Wicksell because there is indeed a natural rate of interest that if equal to the money rate will stabilize an index-price level consisting of many commodities with different weights. In the same way as the constructed price level index, this natural rate is a weighted mean of many natural rates of respective commodities. However, by construction, "such a price level is not unique, and for any composite commodity arbitrarily selected there is a corresponding rate that will equalise the purchasing power, in terms of that composite commodity, of the money saved and of the additional money borrowed for investment." The implicit problem here is that Hayek's theory is a relative price distortion cycle induced by monetary phenomena. When relative price changes, Sraffa argued that the problem of multiple natural rates emerges.

Sraffa's review of *Prices and Production* connects to his criticism of *Treatise*, both were important to the development of *General Theory*. Keynes and Sraffa exchanged several letters in the period of January 1930 to 1932 concerning the themes in dispute (see Ranchetti, 2005). In his famous chapter 17 of *General Theory* ([1936] 1971, pp. 222-3) on the "The Essential Properties of Money and Interest," Keynes develops Sraffa's arguments against Hayek as the center of his monetary theory. Keynes starts saying that "the *rate of interest on money* plays a peculiar part in setting a limit to the level of employment, since it sets a standard to which the marginal efficiency of a capital-asset must attain if it is to be newly produced." Keynes defined the money interest rate à la Wicksell (as "the percentage excess of a sum of money contracted for forward delivery") and proceeds to argue that the same analogous rate exists for any capital asset defined as the rate that equals the spot and forward prices. "Thus for every durable commodity we have a rate of interest in terms of itself — a wheat-rate of interest, a copper-rate of interest, a house-rate of interest, even a steel-plant-rate of interest." In a footnote, Keynes adds, "[t]his relationship was first pointed out by Mr. Sraffa, *Economic Journal*, March 1932, p. 50." This is the only mention of Sraffa in *General Theory*.

At any given moment of time, unless the system is at the long-run equilibrium, the many spot and forward prices (the natural rates) will be "notoriously different for different commodities." Keynes

([1936] 1971, pp. 223-4) claims that the rate that will prevail in the market in the process of equilibrium change will necessarily be the "the *greatest* of the own-rates of interest." The greatest rate is the marginal one that bound the other rates and "which rules the roost (because it is the greatest of these rates that the marginal efficiency of a capital-asset must attain if it is to be newly produced)." Which is the greatest own-rates of interest? Keynes contend that it is the money rate because of the essential liquidity property of money (i.e., low carrying cost and high liquidity premium).

Keynes used Sraffa's argument against Hayek for the rejection of a Wicksellian natural rate. This is a fundamental building block for all theories drawing from Wicksell, both Hayek and Keynes' *Treatise* included. Note that it is at this point that Hayek based his own theory and critique of *Treatise*. Thus, in 1936 Keynes ([1936] 1971, p. 233) wrote that "I am now longer of the opinion that the concept of a 'natural' rate of interest, which previously seemed to me a most promising idea, has anything very useful or significant to contribute to our analysis." The abandonment of the natural rate was a necessary condition to the dismissal of a loans funds market and the introduction of his new liquidity-preference interest theory. Since the natural rate is the bridge between the real and monetary worlds, Keynes could unify both. The demand-price of real investment is determined by the marginal efficiency of capital (which is a function to expected money returns) and the supply-price of investment is said to be the price of finance, not savings, the money rate.

Another criticism made by Sraffa in February 1931 that would be pivotal to Keynes in *General Theory* is regarding the crucial independence assumption in *Treatise* of the price-level of the consumption goods and the price-level of investment goods. "[T]he price level of consumption-goods is solely determined by the disposition of the public towards 'savings,'" and "the price level of investment-goods (whether new or old) is solely determined by the disposition of the public towards 'hoarding' money" (Keynes, [1930] 1971, pp. 129-30). Sraffa asserted that because the consumption-goods market is imperfect (what John Hicks later called a fix-price market), the price for these goods are very inelastic to any fall in demand. In contrast, the securities market is a perfect market (flex-price market). In Sraffa's words, "in reality the price [of consumer goods] is

as sticky as the price of securities is fluid; it would be hard to find two more typical instances of an imperfect, and of a perfect, market" (Sraffa's Papers D1/71; see Kurz, 2010).

In Keynes' income deflation scenario, therefore, prices in the consumption-goods market would vary little and firms would accumulate stocks. In the securities market, however, the price of securities will rise sharply and, in theory, the same firms could issue securities and compensate their losses, restoring the equilibrium position. Nevertheless, according to Sraffa, this is not true in the real world. Instead, firms in the fixed-price market of consumption-goods will adjust the negative demand shock not by issuing new securities but by reducing output. A reduction that will reduce incomes and then exerce a new deflationary pressure by the multiplier.

Moreover, Sraffa criticized Keynes' category of new-investment goods which included capital goods and securities (reminisces of the loans fund market). In Sraffa's perspective, the two are different market categories, and their price levels have different determinants (see Keynes, [1936] 1973, pp. 173-4). In the short period, the price for capital goods depends only upon the demand of entrepreneurs and the securities upon the demand of investors in financial markets. In the long period, the price of capital goods is determined by its cost of production and the price of securities by the money rate of interest. Keynes will use the notion that the price of finance is determined by the money rate which, in turn, is determined by the liquidity preference of investors (and banks, not entrepreneurs) and the money supply.

THE ROAD FROM *A TREATISE ON MONEY* TO *THE GENERAL THEORY*

In his recollections, Hayek ([1966] 1978, p. 284) says that he had put a great deal of work in the two-part review of Keynes' *Treatise*. Moreover, he felt that he "had largely demolished" Keynes' "theoretical scheme (essentially volume I)," although he had "great admiration for the many profound but unsystematical insights contained in volume II." In Hayek's (1983, p. 408) opinion, "the second part of the *Treatise* was probably the best thing that Keynes ever did." As mentioned, after Hayek's second part review appeared in February 1932, Keynes told Hayek that in the meantime he had "changed his mind and no longer believed what he had said in that work." Indeed, soon after the publication of the *Treatise* Keynes began to rework his position.

During and after the controversy with Hayek, Keynes already was repositioning his theoretical views. The Cambridge Circus had convinced him that he was in the *Treatise* trying to explain the persistent equilibrium with unemployment of productive resources using a theory that implicitly assumed that no such a thing could be possible. More importantly, a theory that simply did not explain income and employment but the price level assuming implicitly the output as a given. A point that Hayek also noted in his review. In September 1931, in the depths of depression, Britain finally abandoned the gold standard. The Bank of England no longer had to maintain the money interest rates so high to defend the pre-war exchange rate parity. The long-term interest rates now were not bounded by the short-run restrictive monetary policies.

According to Keynes' theory, the long-term interest rates had to fall and the system could at last return to its full-employment steady-state equilibrium path. This position is symbolically illustrated by one of the rare images in a video of Keynes by the British Movietone in October 1931. The title is "Professor Keynes is Optimist" and the storyline goes as "[f]amous economic expert predicts great future for Britain as result of gold standard suspension." It is symptomatic and representative of Keynes' beliefs in late 1931. [10] The full speech is reproduced below. It is symptomatic and representative of Keynes' beliefs in late 1931.

> "There really seems to be some providence that watches over this country. Two months ago we were in an impossible position. For years passed our industry had been strangled by the exchange value of our money being too high, with the inevitable result that the cost of our goods was also too high for foreign markets. How on earth were we to get lost in an honourable way? For our bankers who had accepted foreign money at high exchange value felt that it would be wrong for us to change the value of our money voluntarily. As events have turned out the change has been forced on us under circumstances extraordinarily fortunate and favourable. We have nothing to fear, honestly nothing. So often in the past ten years I have had to proficy evil but now a great weight is lifted from us, the great tension relieved. There is no danger of the exchange falling too far, there is no danger of a serious rise in the cost of living. The worse I shall expect will be a return to the prices of some two years ago. But meanwhile British trade will have received an enormous stimulus, much more than most of us have yet realised. It is a wonderful thing for our business men and our manufacturers and our unemployed to taste hope again, but they must not allow anyone to put them back in the gold cage where they have been pining their hearts out all these years."

[10] The curious reader can watch the video here Professor Keynes is Optimistic.

However, this was not what happened. The long-term interest rates did not fall and unemployment remained high. Thus, Keynes had to explain how an economy could be stuck in an equilibrium state of affairs with generalized unemployed resources. In this context, Keynes came to note that in an environment of radical uncertainty the interest rates in the markets for long-term bonds were largely determined by the conventional psychology and speculative movements. The long-term interest rates reflect and embody the uncertainty and lack of rational calculation regarding the future. Keynes defined his long-run rate of interest not as his earlier Wicksellian natural rate. His long-run rate is systematically above the Wicksellian equilibrium natural rate due to conventional expectations held in the financial markets. The conventional average market opinion of the proper rate emulated the previous mental model period. The expectational element in the financial markets created by the speculative movements of traders in relation to a possible decline of the interest rate (i.e., money hoarding) constituted the macroeconomic intertemporal coordination failure.

As Keynes (1937a, p. 214) clearly expressed, in face of fundamental uncertainty towards the future and with the urge to decide in the present, economic agents in general rely on three main features. First, "we largely ignore the prospect of future changes about the actual character of which know nothing." Second, "[w]e assume that the *existing* state of opinion as expressed in prices" and output is indeed "based on a *correct* summing up of future prospects." Third, "we endeavor to conform with the behavior of the majority or the average," i.e., with the conventional expectations and judgment.

In consequence, Keynes' long-term rate based on expectational, conventional, and psychological features buried the Wicksellian natural rate. In the monetary market, the money rate is determined by the liquidity preference of the banking system and financial traders and money supply. Marginal efficiency of capital is defined as the rate of return that equals an expected flux of income return and the cost of capital funds (determined by the money rate). If the marginal efficiency of capital exceeds the supply price of capital, new investment is made. The crucial element here is that the uncertainty is intrinsic in both the conjectural, imaginable, and expectational flux of income return

(thus of the demand-price of new capital) and in liquidity preference of banks and traders (thus in the supply-price of new capital).

Keynes mentions Hayek directly in *General Theory* four times ([1936] 1973, pp. 39, 60, 79-80, 192). First, he referred to Hayek's criticism of Pigou on capital. The second is a critical reference on Hayek's definition of income in the same article. The third reference is on "the much vaguer ideas" associated with forced savings. "Is any clear significance discoverable in these?" Keynes (pp. 79-80) argues that the meaning of the proponent authors that employed this phrase is *not* related to his use for the difference between savings and investment in the *Treatise*. Remember that in the *Treatise* Keynes saw his efforts compatible with the Austrian and German "neo-Wicksell school."

> "In my *Treatise on Money* ([1930] 1971, p. 154) I gave some references to earlier uses of this phrase and suggested that they bore some affinity to the difference between investment and 'saving' in the sense in which I there used the latter term. I am no longer confident that there was in fact so much affinity as I then supposed. In any case, I feel sure that 'forced saving' and analogous phrases employed more recently (e.g. by Professor Hayek or Professor Robbins) have no definite relation to the difference between investment and 'saving' in the sense intended in my *Treatise on Money*."

What is clear to Keynes is that forced savings "is a phenomenon which results directly from, and is measured by, changes in the quantity of money or bank-credit." In this case, Keynes sustained, there will be a change in the employment and output volume, which will cause a change in total income measured by wage-units. By its turn, this change will have a double effect. It will cause a "redistribution of income between borrowers and lenders and a change in aggregate income measured in money." In both effects, there will be a change in the amount saved (by the marginal propensity to save). Therefore, changes in the quantity of money or bank-credit result in a change in volume and redistribution of income. And "such changes may involve, indirectly, a change in the amount saved." This is precisely Sraffa's first argument against Hayek in 1932.

In line with Kahn and Sraffa, Keynes (ibid.) argues that this change in savings amounts by changes in volume and redistribution of income due to an increase in quantity of money is "no more 'forced savings' than any other changes in the amounts saved due to a change in

circumstances." There is no qualitative distinction between such a case and one where savings amounts increased due to whatever reason - unless there is a specification on "the amount saved in certain given conditions as our norm or standard." In this sense, all savings are forced savings and all forced savings are voluntary savings. Forced savings is only meaningful when it is defined and specified *ex ante* some standard of savings. Keynes stated that perhaps the only reasonable selection of this standard is "the rate of saving which corresponds to an established state of full employment." Forced savings would be, therefore, the excess of actual savings over what would be saved in a state of full employment. Analytically this definition of forced savings would make sense but Keynes asserted that is not empirically relevant. In his view, the usual state of affairs is a "forced *deficiency* of savings," i.e., income below its potential.

Keynes mentions Hayek's "Note on the Development of the Doctrine of 'Forced Savings'" (1932c) saying that the forced savings definition in relation to a full employment long-run equilibrium was, in fact, the original meaning of the term in Jeremy Bentham's concept of forced frugality. The central underlined hypothesis in Bentham's definition is an increase in the quantity of money when "all hands being employed and employed in the most advantageous manner," i.e., in the long period equilibrium. In these circumstances, the stimulus in aggregate demand will result in forced frugality. Real income cannot be increased and additional investments turn to forced savings *ex post* via inflation. Keynes argues that all classical economists have this full employment situation in mind, but the attempt to extend this notion of forced savings in a "less than full employment involves difficulties."

Keynes' ([1936] 1973, p. 81) contemporary theorists adherents of the forced savings doctrine, he asserted, employed it in an empirical context where the hypothesis of full employment was not valid. If the usual state of affairs is underutilized production factors, the concept of forced savings "is not likely to be fruitful." Keynes challenged Hayek and Robbins to incorporate underutilization of resources and unemployment in their models. "I am not aware of any attempt having been made by the modern writers who are interested in 'forced saving' to extend the idea to conditions where employment is increasing; and they seem, as a rule, to overlook the fact that the extension of the Benthamite concept of forced frugality to conditions of less than full employment requires some explanation or qualification."

Finally, Hayek is mentioned in the appendix to chapter 14 on the rate of interest. Keynes ([1936] 1973, pp. 192-3) refers to the "peculiar theory of the rate of interest" that has been proposed by Mises and Hayek. This theory, Keynes writes, states that changes in the rate of interest can be identified with changes in the relative price of consumption and capital goods. Even though it is not clear to him how this conclusion is reached by its defenders, i.e., via capital theory. Keynes mentions Mises' *Theory of Money* in the then recent English edition, suggesting that he had re-read the book in English after his review in 1914. For Keynes, it seems that marginal efficiency of capital is by a drastic simplification translated and measured by the ratio between the supply price of new consumers' goods and new producers' goods. This ratio is identified with the (natural) rate of interest. This drastic simplification as a "special assumption" could only be justified in a long period equilibrium, "[b]ut when the prices in question are prices prevailing in slump conditions, the simplification of supposing that the entrepreneur will, in forming his expectations, assume these prices to be permanent, is certain to be misleading."

Keynes (p. 193) claims that an increase in individual saving in decreasing the demand for consumption goods also has the effect of lowering the particular marginal efficiency of capital and "hence a lowering of the schedule of the marginal efficiency of capital in general." This has exactly the opposite effect to the reasoning by Mises and Hayek. For Keynes, the investment function depends on the rate of interest and on marginal efficiency of capital, investment is stimulated by a rise in marginal efficiency of capital and/or by a reduction of interest rate. "As a result of confusing the marginal efficiency of capital with the rate of interest, Professor Mises and his disciples have got their conclusions exactly the wrong way round."

EPILOGUE

The collaboration with Kahn was the main intellectual force behind Keynes' new ideas on an aggregate income determination theory. Along with the positive theoretical influence of Kahn and other members of the Circus, Hayek and the controversies that followed in 1931 performed a more subtle and less discussed role. Hayek performed a negative theoretical character in the road to *General Theory* in the sense of indirectly helping Keynes to clarify his own position. Hayek was

perceived as a sort of common antithesis to Keynes and the Circus. In 1931, both Hayek and Keynes shared the Wicksell connection and the main critique of the former to the latter was in the context of this shared framework. Hayek's point was that Keynes derived the cumulative process without the capital microfoundations that Wicksell had worked in his first book. Keynes treated his concepts in terms of aggregate and average forms, not seeing the relative movements in the capital structure. Sraffa's critique of Hayek's business cycle centered on the natural rate of interest in a dynamic economy.

These controversies were pivotal to the abandonment of the Wicksellian roots of the *Treatise* by Keynes, paving the road to the rejection of the natural rate and to the introduction of liquidity-preference theory in *General Theory*. Sraffa's critique to Hayek was an indispensable component to the construction of the chapter 17 of *General Theory*, allowing Keynes to better ground his new interest theory as systematically above the natural rate. Indeed, the very notion of a long-run equilibrium natural rate is rejected in favor of multiple equilibrium possibilities with multiple natural rates. In *General Theory*, one of the essential structural causes for recurrent unemployment is that the money demand for precautionary and speculative reasons, i.e., liquidity preference, prevents the correct adjustment of interest rates to the appropriate level compatible with full-employment. The intertemporal price mechanism failure and the inelasticity of the interest rate to savings and investment are central problems. The adjustments speeds of quantity and prices create coordination failures. In this context, contraction via effective demand failures occurs. Market trades at false prices that transmits false knowledge emerged in conventional financial markets.

Financial markets and its actors are a disrupting mechanism of processing and transmission of knowledge to intertemporal coordination. The price mechanism in the financial markets cannot express the right relative value between present and future, thus the role for socialization of investment. Hayek did not see in financial markets the disequilibrating role that Keynes put as central. The coordination problem is the central aspect for both Hayek and Keynes, although they had different views of not only of *what* (in the macro and micro level) must be coordinated but also *how* the (dis)coordination may emerge within different institutional arrangements.

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