



HAL
open science

Money, Banking and Dynamics: Schumpeter vs. Hayek

Agnès Festré

► **To cite this version:**

Agnès Festré. Money, Banking and Dynamics: Schumpeter vs. Hayek. The Contribution of Joseph Schumpeter to Economics: Economic Development and Institutional Change, R. Arena and C. Dangel-Hagnauer, pp.221-240, 2002. halshs-00271359

HAL Id: halshs-00271359

<https://shs.hal.science/halshs-00271359>

Submitted on 11 Dec 2008

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

5.2. MONEY, BANKING AND DYNAMICS : HAYEK VS. SCHUMPETER

Agnès Festré

Introduction

It is a fairly commonly held view these days that Schumpeter's work on money and banking is by no means easy to access, making it particularly difficult to arrive at clear conclusions regarding the author's own point of view. This difficulty is compounded by Schumpeter's extensive work on the history of thought in this field, encompassing, as it does, thorough investigations of numerous contributions to the debate on money and credit by authors writing in different traditions of economic thought. Among these, the Wicksellian tradition is of particular interest. Firstly, it is from this perspective that Schumpeter's view of the role of bank credit for dynamic economic processes can be best understood¹. Secondly, provided a fairly broad definition of the Austrian school is acceptable, the discussion can be extended to an assessment of the Wicksellian influence, in the field of monetary and business cycle theory, on the Austrian school in general. Although a generation apart and representing different strands, both Schumpeter and Hayek were part of the Austrian tradition. The strand of Austrianism associated with von Mises and Hayek led to the modern Austrian school, whereas Schumpeter developed his own version of Austrian economics which has been considered as unique ever since. However, as we shall develop, these two strands of the Austrian tradition share a common Wicksellian heritage, even though Hayek's and Schumpeter's respective accounts of the dynamic interactions between credit and productive activity appear to be rather distinct analytical extensions of the original Wicksellian cumulative process. To be more specific, comparing the two authors' views on the role played by bank credit through its effects on income distribution –*via* forced saving– and on inflation during the different phases of the cycle dynamics –impulsion, propagation, reversal - is not only a worthwhile exercise in its own right, but is of particular interest with a view to clarifying Schumpeter's conception of capitalist dynamics.

In the first section we discuss the Wicksellian origins of Schumpeter's and Hayek's

¹ For a similar account, see Arena (1985) and de Boyer (1985), although the latter concentrates on the distinction between money and credit which provides the connection between Wicksell and Schumpeter.

approaches to money and banking in the context of dynamic economic analysis. The second section compares the role played by banks and credit in Schumpeter's and Hayek's explanation of economic fluctuations. We conclude by contrasting both authors' perception of economic dynamics.

Schumpeter and Hayek on money, banking and dynamics : Wicksell's legacy

In the aftermath of the so-called 'marginal revolution', many economists writing at the end of the nineteenth and the beginning of the twentieth century considered the static or stationary state of the economy as the methodological starting-point of their analyses. This could then be extended to account for monetary and financial factors as well as for dynamic movements of the economy. In this framework, the introduction of money, bank credit or financial factors does not affect the essential features of the basic case of a static barter economy or a two-commodity exchange. Similarly, dynamics are conceptualised as representing a higher degree of complexity of the basic setting, triggered off by changes in the 'fundamentals'.

This view was not, however, shared by all economists. Wicksell, Schumpeter and Hayek adopted a different approach that can be characterised as follows:

First, they do not believe that a monetary economy can be described as a mere extension of a barter economy, a line of thought also explicitly taken up by Keynes. Wicksell, Hayek and Schumpeter argue that, once bank credit is introduced into economic analysis, the working of the economic system experiences fundamental changes. Indeed, as soon as one accounts for the existence of a banking system, money ceases to be exogenous and to represent no more than the mere counterpart of real exchanges. The *ex novo* and endogenous nature of credit money modifies the conditions governing the co-ordination of saving and investment. While, in a barter economy, both saving and investment are defined in real terms, in a monetary economy credit money can, to a certain extent, come to act as a substitute for real savings. By prompting changes in the mechanisms adjusting saving and investment, it can give rise to global disequilibria. Wicksell provided the first analytical attempt to address these issues, his main contributions in this context being his analysis of the dynamic processes underlying saving and investment movements as well as of the conditions required to establish a saving-investment equilibrium. The 'working hypothesis' at the core of his argument is contained in

his well-known distinction between the monetary rate - which he takes as a given since it is set by the banking system irrespective of real productivity considerations - and the natural rate of interest defined as the rate at which all of aggregate savings are invested. In contrast to the monetary rate, the natural or real rate of interest is likely to vary with investment opportunities based on a rise in productivity. This same distinction is also present in Hayek's analysis and, though less clearly so, in Schumpeter's theory of business cycles and economic development.² Underlying it is another more important distinction, namely that between a cash and a credit economy which can be found in both Hayek and Schumpeter's business cycle theories and which provides the theoretical link to Wicksell's analysis. Moreover, in all three cases, this distinction is more than a mere pedagogic device in that it highlights the important theoretical implications of a shift to dynamic theory.

A second characteristic of Wicksell's, Hayek's and Schumpeter's approaches is that, in contrast to Walras, they interpret the real exchange economy, characterised by a stationary state and full employment, as a preliminary methodological step, allowing the theoretician to describe and characterise the main tools of economic inquiry before moving on to the core subject of economic analysis, i.e. dynamic analysis. The importance given by all three authors to the stationary state can thus be explained by the specific role they attribute to money. The passage from a barter to a monetary economy does not in itself imply the emergence of disequilibria. It is possible to conceive of the special case of a monetary economy where money is "neutral" insofar as it never hinders the inner tendency of the economic system to return to equilibrium. However, not all monetary economies function in this way: Money can also be 'non neutral'. One of several sufficient conditions of such non-neutrality is the existence of an organised system of bank credit. Credit creation by banks allows the quantity of money in circulation to vary and, consequently, a disequilibrium between the money demand of entrepreneurs for investment, on the one hand, and the supply of savings, on the other, becomes a possibility. Wicksell addresses this problem by introducing a different concept of 'neutral money'. He assumes either a monetary system in 'tranquil' conditions, or

² There is no explicit reference to a 'natural' rate of interest in Schumpeter's writings. First, Schumpeter is rather sceptical about the meaning the concept. Secondly, as we shall develop later, Schumpeter conceives of the rate of interest as a purely monetary phenomenon which owes its existence to the emergence of real profits through innovation. It is, however, possible to consider the dynamics of the gap between the rate of interest and the rate of profit in Schumpeter's analysis to a certain extent as a substitute for the interest rate divergence mechanism in Wicksell and Hayek.

a 'properly functioning one', i.e. a state of equilibrium in which savings are invested instantly.³ This system corresponds to what Wicksell describes as a 'pure cash economy'⁴ in which money is 'neutral', credit is absent and the velocity of circulation is quasi stable. The extreme other case is that of 'pure credit economies'⁵ with almost no practical limits to the quantity of money in circulation. Wicksell then introduces another well-known distinction between the monetary rate of interest and the 'natural' (or 'normal') rate of interest. In his own words:

'The rate of interest at which the demand for loan capital and the supply of savings exactly agree, and which more or less corresponds to the expected yields on the newly created real capital will then be the normal or natural rate. At the same time equilibrium must ipso facto obtain (...) in the market for goods and services, so that wages and prices remain unchanged. The sum of money income will then usually exceed the money value of consumption goods annually produced, but the excess of income -i.e., what is annually saved and invested in production- will not produce any demand for present goods but only for labour and future production.'

(Wicksell 1967: 192-193)

What Wicksell is arguing here is that the natural rate of interest corresponds to that level of the rate of interest that would be determined by demand and supply of capital, if the latter was lent without the mediation of the banking system. This mechanism is disrupted as soon as bank credit is introduced into the system as part of the money market. Credit accelerates the velocity of circulation and may therefore cause a disequilibrium between the entrepreneurial demand for cash balances and the supply of 'accumulating savings awaiting suitable investment opportunities.'⁶ In the second volume of his *Lectures*, Wicksell argues that

'(t)he influence of credit on currency may, *under all circumstances*, be regarded as accelerating the circulation of money (...). The occasions on which credit actually

³ Wicksell 1967:11-12.

⁴ Wicksell 1965: 51-58.

⁵ Wicksell 1965: 71-80. The intermediate cases correspond to what Wicksell calls a 'simple credit economy' (ibid.: 59-62;1967: 70) and an 'organised credit economy' (1965: 62-70; 1967: 72).

⁶ Wicksell 1965: 53-58.

replaces money and thereby renders it superfluous may, quite simply be regarded as special cases of the general acceleration of circulation; for instead of a purely physical transfer of money, we have a *virtual*, i.e., merely imaginary or possible transfer, but of the same effectiveness.

(Wicksell 1967: 67)

Thus, if the system is not in proper order, i.e. if the monetary rate of interest diverges from the natural rate, deposits can be created to meet entrepreneurial demand independently of the amount of previously accumulated savings. This disequilibrium situation constitutes the ‘working hypothesis’ of Wicksell’s analysis of the ‘cumulative process’.

Schumpeter’s approach is not fundamentally different from Wicksell’s. The Schumpeterian ‘circular flow’ simply replaces the Wicksellian ‘cash economy’. In the basic framework of the circular flow, money is primarily perceived as a special good serving the purpose of a unit of account and facilitating the circulation of commodities within the economy.⁷ As Schumpeter puts it: ‘Let us now introduce this denominator, of price and medium of exchange and let us choose gold for the role of “money commodity”’. (Schumpeter 1934: 47). However, metal money is not the only conceivable means of payment. Credit - in this case ‘normal credit’⁸ - also plays a part. Together with commodity money, collaterals, or asset-backing requirements it serves as a counterpart to real exchanges. Contrary to Wicksell, when dealing with the case of a ‘simple credit economy’, Schumpeter assumes that ‘normal credit’ does not increase the velocity of money circulation.⁹

However, Schumpeter regards credit creation by banks as the ‘*differentia specifica*’ of capitalism. Indeed, in the same vein as Wicksell, Schumpeter claims that the emergence of a banking system signifies a departure from the static case in that it gives rise to a new category of credit to which he refers as ‘abnormal credit’.¹⁰ This form of credit is associated with the case of economic development, that is with dynamic analysis, since without it neither innovation nor cycles were possible. Thus, the process of economic development creates a situation where the nature and role of money is dominated by its bank credit form. The key

⁷ Schumpeter 1934: 53.

⁸ Schumpeter 1934:100.

⁹ Schumpeter 1934: 55, fn 1.

¹⁰ Schumpeter1934: 102.

role of credit is the *creation* of purchasing power for the purpose of transferring it to innovators in order for them to finance their new productive activities. If the stationary state is confined to the mere transfer of already existing purchasing power, the economic development of a system characterised by private property and division of labour requires the creation of new means of payment. As Schumpeter puts it, by means of credit entrepreneurs gain access to the social stream of goods before they have acquired a normal claim to it.¹¹ Bank credit thus consists in ‘new means of payment created *ad hoc*, since the entrepreneurs have no means of their own and since there are -so far- no savings’(Schumpeter 1934:107). These means of payment do not only include money as such. Schumpeter lists them as ‘commodities which in fact circulate as money’, ‘money made of a material the market price of which is less than the purchasing power of the monetary unit made of it’, ‘bank notes’ but also ‘current accounts and clearing accounts’, ‘the amount of all payments which are disbursements out of income and are handled exclusively by compensation’ and, finally, ‘credit instruments and claim titles of all kinds, to the extent that they in fact perform the role of money’.¹² Therefore, money strictly defined does no longer play the same role as in the circular flow. Schumpeter argues that now ‘not only a part but the whole of the exchange process can be settled by (...) credit media’ (Schumpeter 1934:53).

This generalised role of credit cannot but affect the market for loanable funds. Like Wicksell, Schumpeter shows that credit creation by banks together with the institutional setting that renders it possible - i.e. an organised banking system producing new sources of purchasing power within the economy - disrupts the Walrasian adjustment mechanism of the supply and demand for cash balances. In such an environment, it is logically impossible to interpret the market for money and credit in the same way as any other market in which supply and demand would be represented by independent functions. Thus, Schumpeter maintains that the

‘(...) demand for credit is self-propagating, in that the consequences of its expansion and increasing satisfaction go on creating the economic conditions for even more credit demand. The more bank money is issued, the more credit is necessary for the purchase

¹¹ Schumpeter 1934:107.

¹² J. A. Schumpeter (1917), ‘Das Sozial Produkt und die Rechenpfennige : Glossen und Beiträge zur Geldtheorie von Heute’, *Archiv für Sozialwissenschaft*, vol. 44: 627-715, translated from German by A. W. Marget (1956), ‘Money and the Social Product’, *International Economic Papers*, 6: 207.

of one and the same quantity of means of production, and the more, also, can economically invested in their acquisition. This demand for credit makes possible not only itself, but also a corresponding supply; and every supply makes possible a corresponding demand, so that supply and demand in this case do not confront each other as independent forces. To this extent, therefore, the banks determine not only to whom they will grant credit but also how much credit as a whole they wish to grant and what demand to call forth.'

(Schumpeter (1917) 1956: 207)

Schumpeter's adherence to Wicksell is less clear with regard to the definition of interest rates. In the first place, Schumpeter insists that the short-term rate of interest is essentially a 'monetary phenomenon'. This is a consequence of the definition of saving and investment in monetary terms. Indeed, according to Schumpeter, investment gives rise to an equivalent amount of saving since the latter is defined independently of its real source. In his own terms:

'(B)y Saving we mean the earmarking, by an household, of an element of its current receipts –as distinguished from "capital gains"– for the acquisition of titles to income or for the payment of debt. If a firm does the same thing with an element of its net receipts from the sale of products and services, we shall speak of Accumulation. The distinction between Saving and Accumulation also applies, although it may be difficult to carry out, in cases in which, as in the case of many farmers, 'firm' and 'household' are one. We confine both concepts to decisions about monetary funds and we neglect, for convenience's sake, any similar decision that may be taken with respect to commodities. Saving and Accumulation will thus be treated as elements of a monetary process : the complementary process in the world of goods constitute a distinct problem.'

(Schumpeter 1939/I: 75)

Given this definition of saving, the concept of the real rate of interest loses its relevance since the interest factor is a purely monetary phenomenon. Schumpeter writes:

'(I)nterest –more correctly, the capital sum plus interest– is, to use our turn of phrase, the price paid by borrowers for a social permit to acquire commodities and services

without having previously fulfilled the condition which in the institutional pattern of capitalism is normally set on the issue of such a social permit, i.e., without having previously contributed other commodities and services to the social stream.’

(Schumpeter 1939/I: 123)

Moreover, as the rate of interest is derived from the positive rate of profit associated with the operation of innovative productive activities, it is also a short-term phenomenon. Contrary to Keynes, interest is therefore related to ‘income-money’ or ‘transaction money’ rather than to ‘stock’ or ‘speculative money’. From this point of view, the Wicksellian dichotomy between a real and a monetary rate of interest becomes meaningless. As a matter of fact, Schumpeter never refers to a real rate of interest since he argues that

‘nominal and real rates (...) are only different measurements of the same thing or, if we prefer to speak of different things even in this case, it is the monetary rate which represents the fundamental phenomenon and the real rate which represents the derived phenomenon.’

(Schumpeter 1939/I:111)

In other words, the real and the monetary rates are no longer determined independently from one another since the level of the real rate derives from the difference between the monetary rate of interest and the rate of inflation.

Turning now to Hayek’s views on interest, saving and investment, the distinction between neutral money and credit can be found in his two major contributions on the subject, *Monetary Theory and the Trade Cycle* and *Prices and Production*. As is well known, Hayek assumes that a barter economy is characterised by a tendency towards equilibrium and that this tendency continues to exist when money is introduced. He notes that ‘in a barter economy, interest forms a sufficient regulator for the proportional development of the production of capital goods and consumption goods, respectively’ (Hayek 1966:91-2). More specifically, the introduction of a supply of money- that is, the transition to a monetary economy - has no impact on the tendency towards stability so long as it is backed by an equivalent amount of accumulated savings.¹³ Disequilibria only become a possibility when

¹³ Hayek 1966: 92.

the organisation of credit disturbs the adjustment process towards equilibrium between supply and demand. Credit expansion affects the velocity of circulation.¹⁴ Now, a change in the velocity of circulation ‘represents as it were a one-sided change in demand which is not counterbalanced by an equivalent change in supply’(Hayek 1966:93). Thus, this violation of the logic of supply and demand explains why banks are likely to charge a rate of interest that deviates from the equilibrium level and will not instantly adjust to it. As Hayek puts it:

‘Either because the supply of bank credits is, within certain limits, fundamentally independent of changes in the supply of savings or because the banks have no particular interest in keeping the supply of bank credit in equilibrium with the supply of savings and because it is, in any case, impossible for them to do so - then we shall have proved that, under the existing credit organisation, monetary fluctuations must inevitably occur and must represent an immanent feature of our economic system.’

(Hayek 1966: 152)

This passage clearly indicates Hayek’s adherence to Wicksell as regards the treatment of bank credit and its impact on the determination of the rate of interest. As is well known, the discrepancy between the monetary and the real rates of interest plays a central role in Hayek’s theory of business cycles. However, unlike Wicksell’s cumulative process, Hayek’s theory of the trade cycle is not confined to the explanation of fluctuations in the general price level. In Hayek’s words:

‘The monetary starting point makes it possible, in fact, to show deductively the inevitability of fluctuations under the existing monetary system and, indeed, under almost any other which can be imagined. It will be shown, in particular, that the Wicksell-Mises theory of the effects of a divergence between the ‘natural’ and the money rate of interest already contains the most important elements of an explanation, and has only to be freed from any direct reference to a purely imaginary ‘general money value’ (...) in order to form the basis of a Trade Cycle theory sufficing for a deductive explanation of all elements in the Trade Cycle.’

(Hayek 1966: 147)

¹⁴ *ibid.*

To sum up, our discussion of Schumpeter's and Hayek's respective positions on interest, savings and investment has emphasised their similarities. These include their choice of a stationary equilibrium as the analytical point of departure, the distinction between neutral and active money and the importance of the role attributed to bank credit in the process of the emergence of non-equilibrium dynamics. Important though these similarities are, they should not distract from the differences between the two approaches. These are mainly related to the authors' understanding of economic dynamics as such, and in the following section we, therefore, turn to Schumpeter's and Hayek's explanations of business cycles.

Bank credit and productive dynamics in Schumpeter and Hayek : two distinct views of how credit shapes the economy

So far, we have highlighted the Wicksellian origin of both Schumpeter's and Hayek conceptions of money and banking, focusing on the theoretical implications of the introduction of bank credit for dynamic analysis. Although both authors can be said to adhere to the same Wicksellian tradition, they differ markedly with regard to the mechanisms they regard as constituting economic dynamics.

To begin with, let us recall the main features of Hayek's and Schumpeter's approach to this question: As we have already pointed out, in both explanations of business cycles a state of stationary equilibrium serves as the point of departure. The upswing is then triggered by an increased activity in the investment goods sector that does not meet with sufficient resources, i.e. voluntary savings by the public. Schumpeter argues that this situation is caused by a spurt of innovations, financed through new credit created by banks and organised by entrepreneurs, as opposed to the 'mere managers'¹⁵ who prevail in the circular flow and whose activities are driven by the logic of 'routine'. Once the gestation period for the new goods has come to an end, the economy adjusts towards a new equilibrium position, in the process eliminating some old firms. This is the core of Schumpeter's description of the primary wave –or 'first approximation'– consisting of only two phases : prosperity and depression. Schumpeter then extends his analysis to take account of secondary effects – optimistic or pessimistic expectations, miscalculations and income effects – which reinforce the primary process.

¹⁵ Schumpeter 1935: 83.

Owing to these secondary effects, the economic process will overshoot the new equilibrium position at the end of a period of prosperity. Recession will deteriorate into depression from where a process of recovery will result in the system settling in the near neighbourhood of a new equilibrium position.

For Hayek, deviation from equilibrium is typically caused by a monetary phenomenon, namely a money rate of interest lower than the natural or equilibrium rate. As we shall develop, the thesis of a monetary origin of economic fluctuations needs to be understood in broad terms, as it refers to the inability of the banking system to ensure that the level of the monetary and the natural rate of interest coincide at every point in time, independently of whether or not the impulse for the initial deviation from equilibrium is of a monetary kind. Essentially, the lower money rate of interest induces firms to undertake excessive investment expenditures, financed by money creation rather than by savings. However, this disproportionate increase in investment expenditure cannot be maintained forever, in particular when inflation control is important. The necessary adjustment of the economy's productive structures leads to depression.

As noted by Streissler (1983) and Bellofiore (1991), both Hayek and Schumpeter make use of the mechanism of forced saving in their analyses of the cyclical upswing in order to describe the real effects of credit creation. In Schumpeter's framework, the relevant redistribution of purchasing power is from traditional producers to innovators with banks playing a crucial complementary role in meeting demand for finance by innovating firms. The dynamic process thus set into motion then leads to a new quasi-equilibrium position characterised by higher productivity and an improved utilisation of resources. For Hayek, however, forced saving is equivalent to a redistribution from consumers to investing producers as credit not backed by voluntary savings is channelled towards investment activities, in the course of which more roundabout methods of production are being implemented. In this setting, expansion does not lead to a new equilibrium position but is equivalent to a deviation from the equilibrium path, that is to an economically harmful distortion of the relative (intertemporal) price system. The eventual return to equilibrium then takes place via an inevitable economic crisis.

These basic differences between Schumpeter's and Hayek's approaches are important for clarifying their respective understanding of dynamic processes in the economy. By focusing

on the considerable emphasis both authors put on money and banking in the context of explaining real dynamic processes, it is possible to distil elements of their views on the workings of the business cycle which, in turn, open the way to a better understanding of the meaning they attribute to the notion of economic fluctuations. To simplify the exposition, we will make use of Frisch's well-known distinction between impulse and propagation mechanisms to discuss the role played by banks and credit in the emergence, diffusion and reversal of disequilibria in both Schumpeter's and Hayek's theories of business cycles. As we shall argue, such a comparison is not only interesting in itself but also helps to shed some light on two conflicting theoretical views of the problem of stability (or instability) in capitalist economies which continue to dominate contemporary macrodynamic analysis.

We already know that Schumpeter attributes the origin of business cycles to discontinuous changes arising from innovations disrupting the circular flow which stands at the beginning of the analysis. Naturally, this position encourages a reading of the *Theory of Economic Development* as concerned with the real sphere of economics.¹⁶ Recall, however, Hayek's reading of it:

'This group [of theories] pays close attention to the monetary inter-connections and expressly emphasizes them as a necessary condition for the occurrence of the processes described. But they fail to pass from this realisation to the necessary conclusion; to make it a starting-point for their theoretical elaboration, from which all other particular phenomena have to be deduced. To this group belongs the theory of Professor J. Schumpeter (...).'

(Hayek 1966: 97)

According to Hayek, Schumpeter discards with 'the monetary causes which start the cyclical fluctuations' (Hayek 1966:17). This does not, however, mean that monetary or financial factors play no role in Schumpeter's explanation of the process of economic development. To the contrary, Schumpeter makes it clear that the new combinations brought about by innovation cannot be undertaken without the co-operation of bankers providing entrepreneurs

¹⁶ In this context, Schumpeter's position regarding the origin of disequilibrium is similar to Wicksell's. As is well known, the cumulative process, although describing a far less sophisticated type of dynamics, starts with a real productivity shock which creates a divergence between the monetary and the natural rates of interest.

with the necessary financial means. More precisely, unlike existing production, innovation cannot be financed by a revolving fund or on the basis of returns from production in the previous period. The financing and obtaining of credit is an integral part of the process of innovation. Since entrepreneurs lack the purchasing power required to carry out their investment plans, they must borrow it. As Schumpeter (1934:102) puts it: '(H)e [the entrepreneur] can only become an entrepreneur by previously becoming a debtor.' Thus, innovations give rise to the demand for bank finance, that is, for 'abnormal credit'¹⁷, defined by Schumpeter as the creation of purchasing power to which no existing new goods correspond.¹⁸ Clearly, the relationship between bankers and entrepreneurs is essential for getting a process of economic evolution started. Moreover, the influence of banks goes far beyond the mere provision of credit. According to Schumpeter,

'Since all reserve funds and savings today usually flow to him [the banker] and the total demand for free purchasing power, whether existing or to be created, concentrates on him, he has either replaced private capitalists or become their agent ; he has himself become the capitalist par excellence. He stands between those who wish to form new combinations and the possessors of productive means.'

(Schumpeter 1934: 74)

More specifically, in Schumpeter's analysis banks are seen to have both a permanent and an asymmetric impact on the money market which includes both the 'sphere of hoards and reserves' and the 'sphere of capital.'¹⁹ The common feature of these two spheres, and therefore the distinctive feature of the money market, is that they permit stock markets to work. The money market is the place where 'cash reserves', i.e. 'idle non circulating money', and 'income yielding assets' are mutually exchanged.²⁰ The first sphere of the money market is the 'sphere of hoards and reserves'. The second corresponds to 'capital' or 'income-yielding assets' and includes the real estate and mortgage markets as well as the stock market.²¹ In this framework then, the role of banks is clearly not limited to the control of credit. Schumpeter, in fact, asserts that:

¹⁷ Schumpeter 1934:100.

¹⁸ Schumpeter 1934: 101.

¹⁹ Schumpeter 1956:176.

²⁰ *ibid.*

²¹ Schumpeter 1956: 176.

‘The most cursory glance at money market processes shows that the banks regulate both stock market speculation and the pulse-beat of industrial and commercial life, now restraining, now stimulating them.’

(Schumpeter 1956: 176)

This implies that banks exert a very strong influence on economic life. This power derives from two factors: First, Schumpeter assumes that both spheres of the money market are interrelated. Therefore, the markets for short-term loans and long-term assets do not work separately but interact within a single money market. Secondly, the ‘sphere of hoards and reserves’ depends heavily on banks since the latter can manipulate the volume of available liquidity through the lending of credit. By creating means of payment through organising credit, banks effectively regulate the activity of this sphere. Moreover, the interdependence of both spheres within the money market allows banks to extend their influence to the sphere of income-yielding assets. On the one hand, banks create *ex nihilo* credit means of payment, thereby strongly contributing to the emergence of interest. This, in turn, affects the whole economy in that the existence of interest now constitutes an additional motive to save on the part of consumers. Banks are, thus, not purely neutral intermediaries nor are the effects of credit creation transitory since they give rise to a secondary wave of the creation of new sources of purchasing power which can be mobilised to finance further productive activity. On the other hand, during an upswing banks interfere with real propagation mechanisms by allowing the transfer of productive resources to new entrepreneurs. These reallocation effects can interfere with price competition and alter the outcome of the process of adaptation in the course of which some existent firms turn out to have become unprofitable and are out-selected, while others, seizing new profit opportunities and being backed up by banks, manage to escape bankruptcy.

Furthermore, banks interact with entrepreneurs in determining the volume of credit. While it is the entrepreneurs who initiate the process, banks decide which of these initiatives to finance based on their expectations regarding the profitability of innovative projects and the entrepreneurs’ ability to repay their loans: ‘We know already by what forces this supply is regulated : first with regard to possible failures by entrepreneurs, and secondly with regard to the possible depreciation of the credit means of payment.’(Schumpeter 1934: 195). In another

passage, Schumpeter explicitly argues that

‘(t)he banker must not only know what the transaction in which he is asked to finance and how it is likely to turn out, but he must also know the customer, his business, and even his private habits, and get, by frequently ‘talking things over him’, a clear picture of the situation.’

(Schumpeter 1939/I: 116-117)

On closer examination ²², it is possible to define the equilibrium level of the interest rate at a given point in time by deriving a supply and a demand curve for credit.²³ However, this description of the workings of the money market is not very satisfactory. In the first place, banks select entrepreneurs not only by setting the rate of interest but also by evaluating innovations as well as the entrepreneurs themselves and the subsequent use they make of a loan. Secondly, the changes in the demand for finance occurring throughout the cycle affect not only actual but also potential credit (i.e. the maximum credit banks can create in a given institutional context). Moreover, the question of technical limits to credit supply, such as may arise in a monetary system when banking operations are constrained by reserve requirements and when there is a preference for cash on the part of the public, is of little relevance to Schumpeter, given that banks can ration credit and manage cash/deposit ratios in a procyclical manner, reducing them in prosperity and raising them in a depression. ²⁴ In short, the actual supply of credit shifts with the demand and does not face a definite ceiling of potential credit supply since the latter moves procyclically. This also explains the manner in which the creation of purchasing power works, leaving us with the question of how this affects real productive activity. This is a point particularly worth developing since, as we shall see, Schumpeter’s position on the role of inflation and forced saving sharply differs from Hayek’s.

According to Schumpeter, the new sources of purchasing power created by banks are targeted at individual entrepreneurs and their specific productive projects. To put it differently, credit precedes the realisation of entrepreneurial profits. While, credit inflation may occur in this context, it will only be of temporary duration. In Schumpeter’s words:

²² The rationale for this analytical development can be found in Schumpeter’s *Theory of Economic Development*. See Schumpeter 1934: 191-198.

²³ See Bellofiore 1991: 378 and Messori 1984.

²⁴ Schumpeter 1934: 112-115; 1939: 121-123; 1956: 206-208.

‘After completing his business –in our conception, therefore, after a period at the end of which his products are on the market and his productive goods used up– he [the entrepreneur] has, if everything has gone according to expectations, enriched the social stream with goods whose total price is greater than the credit received and than the total price of the goods directly and indirectly used up by him. Hence the equivalence between the money and commodity streams is more than restored, the credit inflation more than eliminated, the effect upon prices more than compensated for, so that it may be said that there is no credit inflation at all in this case –rather deflation– but only a non-synchronous appearance of purchasing power and of the commodities corresponding to it, which temporarily produces the semblance of inflation.’

(Schumpeter 1934: 110)

Turning now to forced saving, this appears to be of secondary importance in Schumpeter’s analysis of economic development. While it is true that, whenever innovation entails a lengthening of the period of production, the output of consumer goods and, thus, of real consumption, is likely to decrease during the gestation period, voluntary saving out of income arising from the expenditure of new money cannot be ruled out.²⁵ In this case, even though productive resources are being redistributed between new entrepreneurs and ‘mere-managers’, there is no forced saving. Moreover, and more importantly, it has to be stressed that the main phenomenon is the absolute squeeze of the purchasing power of old firms, so that forced saving, if it occurs at all, takes the form of an indirect process based on a reduction in the purchasing power of existent productive units.

Considering now the mechanisms underlying the reversal of the cycle, banks can continue to exert some influence during the upward phase. Although the supply of credit cannot be invoked directly to explain the upturn of the cycle – recall that potential credit supply increases during the upswing – banks may, however, delay the end of the expansionary phase or, more likely, anticipate it. It is, in fact, probable that they will impose a risk-premium accounting for the devaluation of capital due to inflation or tighten the rationing of credit, since the risk of innovation is carried not by the entrepreneur but by the banker.²⁶

²⁵ This scenario is also envisaged by Robertson in *Banking Policy and the Price Level* (1926).

²⁶ Schumpeter 1934: 75-76; 1939: 104.

Hence, in Schumpeter's explanation of business cycles, banks clearly play a major role in the dynamics of accumulation. However, their influence is not unambiguous since the rate of interest on loans is a 'tax' on profits and thus constitutes a brake for economic development.²⁷

Returning to Hayek's description of economic fluctuations, his objections to Schumpeter's approach can now be understood more easily. According to Hayek, the introduction of a banking system into economic analysis disturbs the adjustment process between capital supply and money demand. In other words, as soon as credit is allowed for, supply and demand will no longer adjust automatically and prices no longer determine a path towards economic equilibrium. Consequently, prices will no longer provide signals for short-term market adjustments. To the contrary, 'these prices may elicit movements which not only do not lead to a new equilibrium position but which actually create new disturbances of equilibrium.'²⁸

Banks, interested in keeping the credit supply elastic, will, in particular, set a money rate of interest which does not, in general, correspond to the equilibrium or the natural rate. The former is determined by the liquidity of banks, while the latter is always determined by its role in adjusting capital supply to demand.

The above comparison of Schumpeter's and Hayek's views on bank credit and business cycles is of particular interest for two main reasons: First, it reveals the importance of banks and, more generally, of the banking system as a driving force behind economic fluctuations. Secondly, it also suggests that, in a monetary economy, disequilibria can be described in terms of a co-ordination failure of the interest rate mechanism. In such an economy, any given mechanism or organisational device, such as, for instance, the organisation of credit, which inherently relies on this co-ordination failure will result in the formation of prices or rates of interest that deviate from those associated with a barter economy equilibrium. Yet, if the above analysis is valid, any other situation leading to disequilibrium prices could also be invoked to explain the same phenomenon. Hayek did, in fact, consider some such situations. Thus, he refers, for instance, to 'changes in the relations of costs and selling prices', to 'shifts in the distribution of incomes' (Hayek, 1966:129) and to the possibility of 'a rate of interest

²⁷ Bellofiore 1991: 379.

²⁸ F. Hayek, 1966, p. 94.

[on loans] lowered by monetary influences' (ibid.:128). However, Hayek's position on the subject of 'monetary influences' is unclear. In *Monetary Theory and the Trade Cycle*, he insists that the elasticity of the volume of money is an 'immanent necessity of the monetary and credit mechanism' (ibid.:127), and conveys the impression that the endogenous nature of the mechanisms of credit creation by the banking system represents a necessary and sufficient condition for business cycles, whether or not it results from arbitrary interference by the banking authorities. By contrast, in *Prices and Production*, he chooses the 'case of an increase of money in the form of credits granted to producers' (Hayek 1935:54) as the starting point of a cycle. Here, a fall in the rate of interest is clearly regarded as resulting from 'deliberate' decision-making (ibid.:85). This ambiguity arises, in part, because Hayek fails sufficiently to clarify which institutional monetary framework he has in mind. In any case, his discussion of the ways in which banks interfere with real propagation mechanisms is a good example of the lack of coherence in his treatment of money and banking in the wider context of his theory of business cycles.

As is well known, in his theory the upswing of a cycle is characterised by an increase in the demand for capital emanating from producers' awareness of new investment opportunities and their access to bank credit. Capital newly raised in this way is then employed in the implementation of more roundabout processes of production. However, since full-employment prevails, the increase of capital goods can only be achieved by withdrawing productive resources from already existing shorter lines of production. Therefore, the growth in the production of capital goods is accompanied by a decline in the output of consumption goods. Assuming that wages only rise with some delay, prices of capital goods rise faster than those of consumption goods, thus reinforcing the expansionary movement. There are, moreover, additional such reinforcing factors linked to the 'organization of credit'. Consider Hayek's conceptualisation of the banking system in some more detail: Unlike von Mises, Hayek assumes a 'mixed' monetary system with both an exogenous and an endogenous form of money. Commercial banks take their decisions on the basis of their profit expectations which depend on the risk characteristics of borrowers as well as on the actions of their respective competitors. The bank's risk aversion grows as expansion proceeds and is not independent of their pricing policy. At a given risk level, the decision not to satisfy demand (by imposing a too high loan rate) implies a greater opportunity cost for the banker. This raises the winner's curse problem, i.e. it leads to a situation where banks will expand credit in

the upswing even at the cost of depleting their resources, so as not to lose clients and encounter additional risks. In this way, there is an 'elastic' deposit multiplier which sustains a growing productive activity.

However, a point will be reached at which consumers will face an insufficient supply of consumption goods, thus creating tension in the economy. The situation is aggravated by the fact that additional income has been generated during the upswing. This induces a counter-movement of relative prices: Consumption good prices will rise while capital good prices will fall, and the original price ratio will be re-established. Contrary to Schumpeter, Hayek argues that these are technical limits to the creation of credit, so that it is the specific behaviour of banks that determines the upper turning point of the cycle.²⁹ In other words, the flexible deposit multiplier described above appears to be bounded. Hayek indicates, in fact, that, when the price of consumer goods begins to rise faster than the price of capital goods, the ratio between cash payments and payments by cheque is altered in favour of the former. Consequently, in the course of a boom, the need for cash will increase along with prices and induce a cash drain that will force banks to restrict credit supply. Hayek's reasoning is as follows:

'Concerted action in this direction, which for competitive reasons is the only action possible, will ensue only when the increased cash requirements of business compel the banks to protect their cash balances by checking further credit expansion, or when the Central Bank has preceded them. This, again, will only happen, as a rule, when the banks have been induced by the growing drain on their cash to increase their re-discount. Experience shows, moreover, that the relation between cheque-payments and cash payments alters in favour of the latter as the boom proceeds, so that an increased proportion of the cash is finally withdrawn from the banks.'

(Hayek, 1966: 174-175).

Therefore, even without reserve restrictions, credit expansion must come to a halt before an accelerating rate of inflation undermines the function of money as the unit of account. In *Prices and Production*, Hayek writes:

‘So long as the banks go on progressively increasing their loans it will, therefore, be possible to continue the prolonged methods of production or perhaps even to extend them still further. But for obvious reasons the banks cannot continue indefinitely to extend credits; and even if they could, the other effects of a rapid and continuous rise of prices would, after a while, make it necessary to stop this process of inflation.’

(Hayek 1935: pp. 89-90)

This brings us to Hayek’s view on forced saving. When dealing with the case of forced – as opposed to voluntary – saving, Hayek assumes given and stable consumers’ preferences. It is supposed that banks start the cycle, whereas for Schumpeter the prime mover is entrepreneurial action. Credit supply is regarded as normatively limited by savings or, to be precise, even by a definite upper limit since a lengthening of the time structure of production, made possible by bank credit, proves not to be sustainable once credit supply meets this limit. By contrast, Schumpeter argues that *ex novo* credit creation may not only make saving dependent on investment but also has no intrinsic limit. It should, however, be pointed out that, in his earlier writings, Hayek’s views on forced saving are not all that different from Schumpeter’s.³⁰ Thus, Hayek writes, for example, in 1925:

‘The losses which arise from the revelation that the capital outlay made is not yet economically justified are the price of an undesirably rapid progress, a rate of progress which exceeds that which people are ready to purchase for themselves by a corresponding voluntary sacrifice of current enjoyments. – There can be no doubt at all that the development of the capitalist economy over the last 100 years would not have been possible without the ‘forced saving’ effected by the extension of additional bank credit. Hence economic fluctuations must probably be regarded as a necessary accompaniment of the accelerated development experienced by countries of the Western world in the last 150 years. Such fluctuations, in turn, could be entirely eliminated only if the tempo of this development was substantially lessened (...).’

(Hayek 1984: 21)

This passage by Hayek points to a puzzle in his conception of the role played by the banking

²⁹ See Hansen and Tout 1933: 133-135; Colonna 1994: 41-44.

³⁰ See Klaussinger 1995: 99.

system in the unfolding of economic dynamics. In *Monetary Theory and the Trade Cycle*, Hayek conveys the impression of taking a commercial banking system for granted whose monetary liabilities enter circulation by way of loans to manufacturers. He also emphasises ‘the potential implicit in this institutional fact for the creation of money to interfere with the capital market’s co-ordination of saving and investment’ (Laidler 1994:9). However, in *Prices and Production*, when discussing the case of ‘voluntary savings’, he refers instead to a monetary system consisting of stable base money, thus eliminating the confusion between ‘those deposits which find their origin in credit and those which arose through cash payments’ (Hayek 1966:163) that was at the root of the unsustainable cash drain in *Monetary Theory and the Trade Cycle*. As stressed by Trautwein, this ‘dual’ treatment of the monetary system renders Hayek’s distinction between the cases of ‘voluntary savings’ and ‘forced savings’ inconsistent. There is indeed no reason to assume that in the case of ‘forced savings’ banks act as passive brokers, if we have in mind the same underlying institutional framework as in *Monetary Theory and the Trade Cycle*. To put it another way, if we conceptualise banks as creators of money that cannot, therefore, distinguish precisely between deposits originating in credit and those originating cash payments, an increase in voluntary savings would also imply an expansion of bank deposits, triggering exactly the kind of destabilizing mechanisms as does the direct creation of credit.³¹

Thus, a closer look at Hayek’s conception of money and banking reveals inconsistencies with regard to the institutional framework underlying his theory of business cycles. This ‘schizophrenic treatment of the bank’s behaviour’ (Trautwein 1996:45) explains why Hayek ultimately choose to focus on the real side of the economy and, in particular, on the sphere of production and the question of factor substitution. This shift of focus is present in *Prices and Production* and is reinforced in *Profits, Interest and Investment*.

Conclusion

³¹ See Trautwein 1994: 77; 1996: 45-46. These inconsistencies in Hayek’s analysis are also taken up by Sraffa in his critique of Hayek. Sraffa argues that Hayek’s case of ‘voluntary savings’ effectively describes a situation where there is no money at all (Sraffa 1932: 47). See also Hansen and Tout 1933: 139-140; Neisser 1934: 436-439.

Our re-examination Schumpeter's and Hayek's theoretical frameworks has revealed significant similarities in their business cycle theories, which we have traced back to their common Wicksellian heritage. This is not, however, a surprising insight for historians of economic thought. Schumpeter and Hayek were both prominent economists but they were also great historians of economic thought.

In his early writings, Schumpeter referred to Wicksell's fundamental contribution to monetary theory.³² He also paid a specific tribute to Wicksell in a German article entirely dedicated to the works of the Swedish author³³, and he persistently emphasised the importance of Wicksell's work in his *History of Economic Analysis*. Hayek, too, acknowledged Wicksell's strong influence on the evolution of his own conception of economic theory. In one of his first articles in 1925, he comments extensively on several of Wicksell's contributions to economic analysis. Moreover, as we know, he frequently referred to Wicksell in *Prices and Production*, thereby contributing to the diffusion of Wicksell's ideas among his English speaking readers.

However, our comparison has also shown that Schumpeter and Hayek provide two distinct explanations of how credit shapes the economy. According to Schumpeter, business cycles are the very vehicle of progress and growth.³⁴ Therefore, any attempt to get rid of fluctuations would amount to eliminating the dynamics of capitalism. Given that the upswing requires co-operation between banks and innovating entrepreneurs, both money creation and forced saving are, as a means for redistributing purchasing power to new productive units, necessary and beneficial components of the workings of a modern economic system. In this he differs sharply from Hayek who takes as his point of reference a state of intertemporal price equilibrium. Under ideal conditions, this situation also represents an optimal state. Deviations from this point of reference are the result of a divergence between the equilibrium and the monetary rate of interest, where the latter can be maintained for some time on the basis of elastic credit supply by banks. Forced saving then signals a global disequilibrium, a 'dis-

³² J. A. Schumpeter (1917), 'Das Sozial Produkt und die Rechenpfennige : Glossen und Beiträge zur Geldtheorie von Heute', *Archiv für Sozialwissenschaft*, 44: 627-715.

³³ J. A. Schumpeter (1927), 'Zur Einführung der Folgenden Arbeit Knut Wicksells [Mathematische Nationalökonomie]', *Archiv für Sozialwissenschaft*, 58 :238-51.

³⁴ Note that Robertson's view on productive credit creation and forced savings is not very different from Schumpeter's. Robertson did, in fact, point out 'that a little forced saving now and again (...) [might] be the price for (...) progress'. (1928: 57).

coordination' of saving and investment plans which can no longer be carried out as originally envisaged. However, given Hayek's belief in the existence of a tendency towards equilibrium, he attributes the causes of fluctuations to external factors. Thus, for Hayek, the ideal state is one of an evenly evolving economy without business cycles and characterised by neutral money. Whereas Schumpeter's concept of economic dynamics is that of business cycles driven by innovation together with the complementary and necessary role played by bank credit, for Hayek it consists in the absence of such cycles.

References

Arena, R. (1985) 'Circulation, revenu et capital : théorie monétaire et tradition quantitative', in R. Arena and A. Graziani (eds.), *Production, circulation et monnaie*: 47-76, Paris : Presse Universitaires de France.

Bellofiore, R. (1991) 'Money and Development in Schumpeter', in J. Cunningham (ed.), *Joseph A. Schumpeter: Critical Assessments*, vol. IV:371-394, London: Routledge.

de Boyer, J. (1985) 'Taux d'intérêt et quantité de monnaie : note sur la distinction entre deux sphères de circulation chez T. Tooke, K. Wicksell, J.M. Keynes et Schumpeter', in R. Arena and A. Graziani (eds.), *Production, circulation et monnaie*: 371-386, Paris : Presse Universitaires de France.

Colonna, M. (1994) 'Hayek's trade cycle theory and its contemporary critics, in: M. Colonna and H. Hagemann (eds) *Money and Business Cycles. The Economics of F. A. Hayek*, vol. I: 27-53, Aldershot: Edward Elgar.

Haberler, G. (1941) *Prosperity and Depression*, Geneva: League of Nations (3rd edition).

Hansen, A.H. and H. Tout (1933) 'Annual survey of business cycle theory : investment and saving in business cycle theory', *Econometrica*, 1: 119-147.

Hayek, F.A. (1925) 'Die Währungspolitik der Vereinigten Staaten seit der Überwindung der Krise von 1920', *Zeitschrift für Volkswirtschaft und Sozialpolitik*, 5. Translated from German in R. McCloughry (1984) (ed.) *F.A. Hayek: Money Capital and Fluctuations, Early Essays*. London: Routledge and Kegan Paul.

Hayek, F.A. (1928) 'Das intertemporale Gleichgewichtssystem der Preise und die Bewegungen des 'Geldwertes'', *Weltwirtschaftliches Archiv*, 28: 33-76. Translated from German in R. McCloughry (1984) (ed.), *F.A. Hayek: Money Capital and Fluctuations, Early Essays*: 71-117, London: Routledge and Kegan Paul.

---- ([1931] 1935) *Prices and Production*, London:Routledge.

---- ([1933] 1966) *Monetary Theory and the Trade Cycle*, New York: A. M. Kelley Publishers.

---- (1939) *Profits, Interest and Investment and other essays on the theory of industrial fluctuations*, London: Routledge and Sons.

Klaussinger, H. (1995) 'Schumpeter and Hayek : Two Views of the Great Depression Re-examined', *History of Economic Ideas* 3,3: 93-127.

Laidler, D. (1994) 'Hayek on neutral money and the cycle' in M. Colonna and H. Hagemann (eds) *Money and Business Cycles. The Economics of F. A. Hayek*, vol. I : 3-26, Aldershot: Edward Elgar.

Laidler, D. (1995) 'Robertson in the 1920s', *The European Journal of Economic Thought*, 2:151-174.

Messori, M. (1984) 'Il credito nel modello di Schumpeter' in M. Messori (ed) *Atti del convegno : Società sviluppo impresa. Nel centenario della nascita di J. A. Schumpeter*, Milan : Franco Angeli.

Neisser, H. (1934) 'Monetary Expansion and the Structure of Production', *Social Research*: 434-57.

O'Driscoll, G.P. (1994) 'An evolutionary approach to banking and money' in J. Birner and R. van Zijp (eds.), *Hayek, co-ordination and evolution: His legacy in philosophy, politics, economics and the history of ideas* :126-137, London: Routledge.

Robertson, D. H. (1926) *Banking Policy and the Price-Level*, London: P. S. King & Son Ltd.

Robertson, D. H. (1928) 'Theories of Banking Policy'. reprinted in D. H. Robertson, *Essays in Monetary Theory* : 39-59 , London: Staples Press, 1940.

Schumpeter, J. A. (1917) 'Das Sozial Produkt und die Rechenpfennige : Glossen und Beiträge zur Geldtheorie von Heute', *Archiv für Sozialwissenschaft*, 44: 627-715. Translated from German by A. W. Marget, 'Money and the Social Product', *International Economic Papers*, 6, 1956.

---- (1927) 'Zur Einführung der Folgenden Arbeit Knut Wicksells [Mathematische Nationalökonomie]', *Archiv für Sozialwissenschaft*, 58: 238-51.

---- (1934) *The Theory of Economic Development*, Cambridge: Harvard University Press.

---- (1939) *Business Cycles*, New York/London/Hamburg: McGraw-Hill Book Company, 2 vols.

---- (1954) *History of Economic Analysis*, London: Allen and Unwin.

Sraffa, P. (1932) 'Dr. Hayek on Money and Capital', *Economic Journal*, 42: 42-53. Reprinted in B. Caldwell (1995) (ed.) *The Collected Works of F. A. HAYEK*, vol. 9: *Contra Keynes and Cambridge: Essays, Correspondence*, London: Routledge.

Streissler, E. (1983) 'Schumpeter and Hayek : On Some Similarities in their Thought' in F. Machlup, G. Fels and H. Müller-Groeling (eds.) *Reflections on a Troubled World Economy. Essays in Honor of Herbert Giersch* :356-364, London: Macmillan.

Trautwein, H.-M. (1994) 'Hayek's double failure in business cycle theory : A note' in M. Colonna and H. Hagemann (eds) *Money and Business Cycles. The Economics of F. A. Hayek* ,vol. I, Aldershot: Edward Elgar.

---- (1996) 'Money, Equilibrium, and the Business Cycle : Hayek's Wicksellian Dichotomy', *History of Political Economy* 28,1: 27-55.

Wicksell, K. ([1898], 1965) *Interest and Prices*, New York: M. Kelley Publishers.

---- ([1906], 1967) *Lectures II: Money*, New York: M. Kelley Publishers.