

Lifting the Veil on Interest*

István Ábel – Máté Lóga – Gyula Nagy – Árpád Vadkerti

The central bank practice which emerged in the period following the financial crisis called into question numerous elements of interest rate considerations. In this paper we present a new theoretical framework that dispenses with the concept of real interest altogether, as a vague and unnecessary category both in policy judgements and business decisions. This approach breaks with the traditional theory of economics. Traditional macroeconomics places its argumentation in the context of real analysis, which hinders the understanding of economic processes. Schumpeter and subsequently, Keynes took a stand against this approach and, rebuffing the real approach, turned to monetary analysis as early as a century ago. In the framework of the classical theory of economics, they describe monetary policy as an adjustment to the natural rate of interest. In this article we propose a different approach. Describing the role of fiat money, the endogenous money theory puts the lending activity of commercial banks into the focus of money creation. This concept also put central bank monetary policy in a new framework. According to this approach, central banks assume an exclusive role in determining the interest rates, but the central significance of the interest rate policy weakens. Once we recognise the crucial role of commercial banks in money creation, the role and function of the central bank changes. The central bank no longer controls money creation solely by shaping the interest rate policy, but also by way of the micro and macroprudential regulation of lending.

Journal of Economic Literature (JEL) codes: E43, E52, E31

Keywords: macroeconomics, economic policy, monetary policy, interest

* The papers in this issue contain the views of the authors which are not necessarily the same as the official views of the Magyar Nemzeti Bank.

*István Ábel is a Professor at the Budapest Business School. E-mail: abel.istvan@uni-bge.hu
Máté Lóga is a Head of Department at the Magyar Nemzeti Bank. E-mail: logam@mnk.hu
Gyula Nagy is a College Professor at the Budapest Business School. E-mail: drnagy.gyula@uni-bge.hu
Árpád Vadkerti is a Professional Secretary at the Magyar Nemzeti Bank. E-mail: vadkertia@mnk.hu*

This article was written with the support of the Office for Research Groups Attached to Universities and Other Institutions of the Hungarian Academy of Sciences through funding provided to the MTA-BGE Macroeconomic Sustainability Research Group. Gyula Nagy is member of the research group. The views expressed in this paper are those of the authors and do not necessarily reflect the official views of the Magyar Nemzeti Bank or Budapest Business School.

The Hungarian manuscript was received on 5 November 2018.

DOI: <http://doi.org/10.33893/FER.18.3.2951>

1. Joseph Schumpeter's theory of economic development and monetary analysis

In the debates following the escalation of the 2008 global financial crisis, there was a sharp increase in the criticism of mainstream economics, the dominant school of economic thought rooted in classical and subsequently, neoclassical theories. Nearly all stakeholders – including policymakers, users and subjects of economic policy – as well as the general public, voiced their dissatisfaction with the approach of mainstream economics and the paradigm it designates. The fundamental problem that crystallised during these debates had already been recognised, but this had not led to any changes in economics textbooks. As early as 1911, Joseph Schumpeter's theory of economic development and innovation had already objected to the principal shortcoming of the traditional (classical) approach which has dominated economic thinking to date, namely, the fact that the theory was built on the principles of *real analysis*, whereas economic agents make their decisions by weighing the performance reflected in the nominal processes measured by money (Schumpeter 1980). Schumpeter sharply criticised and broke with what we now call the mainstream – the dominant classical theory of economics at the time. In a later work, Schumpeter summed up the essence of real analysis as follows:

“Real Analysis proceeds from the principle that all the essential phenomena of economic life are capable of being described in terms of goods and services, of decisions about them, and of relations between them. Money enters the picture only in the modest role of a technical device. (...) But so long as it functions normally, it does not affect the economic process, which behaves in the same way as it would in a barter economy: this is essentially what the concept of Neutral Money implies. Thus, money has been called a ‘garb’ or ‘veil’ of the things that really matter, both to households or firms in their everyday practice and to the analyst who observes them. Not only can it be discarded whenever we are analysing the fundamental features of the economic process, but it must be discarded just as a veil must be drawn aside if we are to see the face behind it” (Schumpeter 1954:264).

Schumpeter was not an advocate of this “classical” theory and took a stand for monetary analysis in the arguments presented later in the same work.

“Monetary Analysis introduces the element of money on the very ground floor of our analytic structure and abandons the idea that all essential features of economic life can be represented by a barter-economy model. Money prices, money incomes, and saving and investment decisions bearing upon these money incomes, no longer appear as [nonessential] expressions (...) of quantities of commodities and services and of exchange ratios between them: they acquire a life and an importance of their own, and it has to be recognized that essential features of the capitalist process may depend upon the ‘veil’ and that the ‘face behind it’ is incomplete without it” (Schumpeter 1954:265).

The theories falling in the scope of real analysis are all based on the acceptance of the hypothesis – as a “critical assumption”, to use the term applied by *Rodrik (2015)* – that the operation of the economy can be adequately captured by the relationship between real variables. In this view, money only “intermediates” – or shrouds as a veil – these real relationships. Since the only role of money is to facilitate smooth exchange, this also means that such a description captures the economy practically as one that is based on a direct exchange of commodities (barter). Thanks to the intermediary role of money, in this system the barter is smooth, cost-free and coordinated. This implies the assumption of a *perfectly competitive market*. By contrast, monetary analysis focuses on financial flows that materialise as the *actual* financial reflection of the exchange processes. It addresses the effects of money incomes, nominal prices and investment decisions where monetary flows acquire an independent and peculiar significance and determine the circular flow of economic life. The term “*actual*” emphasises that the effects also include the consequences arising from the power structure between the players, i.e. power itself, as opposed to the idea of perfect competition where the infiltration of power would rip a gash in the belief of absolute perfection. The concept that economic development cannot be captured by mainstream real analysis is a key element in Schumpeter’s theory of economic development. The author’s rejection of the philosophy and thinking of mainstream economics is demonstrated particularly clearly by his explanation of the key role of credit in economic changes. It is credit that provides the means for the reallocation of resources necessary for innovation and for the appearance of new combinations (*Schumpeter 1980:116–117*).

In this paper, we wish to shed light on the drawbacks of mainstream interest rate theories. This is related to the fact that classical economics, and in several regards the contemporary mainstream neoclassical theory, depends on the real approach even in relation to interest rates.

One of the difficulties in discussing the shortcomings of mainstream economics is the fact that the mainstream, as such, is non-existent. There are various trends and lumping them together is only possible on an overly generalised level. For the purposes of this paper, besides classical macroeconomics, we also consider later versions of the mainstream. We often refer to the objections voiced by Schumpeter and Keynes. Obviously, their critical remarks mainly targeted the classical version. Consequently, they may have had a different choice of words with respect to the neo-Keynesian version. The statements quoted in this paper are applied with the accents and connotations implied by the post-Keynesian approach.

In the next section, we make a brief diversion to mark the place of our article on the map of these trends. For this purpose, we highlight the main assertions of various theoretical concepts on monetary policy. The mainstream is represented by the neo-Keynesian synthesis of the neoclassical school. Since currently this trend can

be regarded as the macroeconomic framework of monetary policy, in this section we refer to it as the “new consensus”.

2. Main differences between the mainstream and the post-Keynesian approach

After the global economic crisis of 1929–1933 and even more so after World War II, Keynesian ideas played a dominant role in shaping economic policy. Keynes radically broke with the classical approach. An important element of this departure was the fact that in the face of the supremacy of free competition and the market, the state increasingly intervened in economic processes in order to maintain efficient demand. By the 1970s, this economic policy reached an impasse. Despite high level of public spending, growth decelerated while inflation increased (stagflation). The neoclassical synthesis and the monetarist approach tackled this challenge with tight budgetary control. Emphasising the primacy of monetary policy, the government introduced strict restrictions and successfully restrained inflation. During this period, Milton Friedman’s principles served as the theoretical framework of monetary policy. Based on this theory, the central bank could control the quantity of money fairly well by the allocation of central bank liquidity (central bank reserves) via money multipliers that were assumed to be stable.

However, the applicability of the theory suffered a severe blow when it became clear that the value of money multipliers is not constant, but rather variable. Due to new products and payment options emerging with the development of money markets and bank services, the definition of the quantity of money also became problematic. Previous concepts about the categories of broad money were no longer capable of describing the true role of money in the economy. With a view to addressing the practical problems of monetary policy, a new neoclassical consensus emerged, inspired primarily by the studies of neo-Keynesian economists (*Lavoie 2004:15–16*). The new consensus integrated the practical changes: thus, it accepted that central banks dispensed with the regulation of the quantity of money and turned their attention to setting interest rates. In the context of the neoclassical theory this meant that they abandoned the IS–LM framework (*Blinder 1997, McCallum 2001, Romer 2000*). Another consequence of the neo-Keynesian modifications was that the mainstream integrated two key elements from the post-Keynesian (Modern Monetary Theory) principles: the principles of the endogenous money supply and the exogenous rate of interest. This means that the assumption of the central bank’s (exogenous) control over the quantity of money was abandoned, and instead, the focus of monetary policy shifted to the central bank’s (exogenous) interest rate setting. By contrast, the IS–LM theory had assumed that the quantity of money is determined exogenously by the central bank, whereas the interest rate evolves endogenously in the market as the supply of saving and the demand of investment reach an equilibrium in the market.

As regards the mainstream, i.e. monetary policy, the neo-Keynesian correction of the neoclassical synthesis – which is referred to in *Table 1* as the new consensus – is extremely close to what is proposed by the post-Keynesian renewal in respect of the contemporary policy framework.

Table 1		
Post-Keynesian principles versus mainstream theory (new consensus) on monetary policy		
	Mainstream (new consensus)	Post-Keynesian
Schumpeter principle	Real analysis	Monetary analysis
Equilibrium interest rate, natural interest rate	At equilibrium, it is defined by productivity and saving (Wicksell).	It has no economic policy significance. Equilibrium may emerge under any interest rate and it does not necessarily mean full employment.
Key policy rate	Classical mainstream: it is determined by the market (endogenous). New consensus: it is determined by the central bank (exogenous).	It is determined by the central bank (exogenous).
Money supply	Classical mainstream: it is determined by the central bank (exogenous). New consensus: it is not a central bank target variable (from a central bank perspective, it is endogenous, money multiplication through changes in the central bank reserves).	It is determined by the credit demand of the economy (shaped endogenously by the banking sector; money multiplication is irrelevant).
Inflation	Inflation is caused by excessive money supply.	By changes in the credit supply, money supply adjusts to rising prices and economic growth. The increase in the liquidity need of trade and the expansion in loans outstanding are interrelated.
Financial stability	Price stability maintains financial stability (one objective – one instrument).	In addition to price stability, the central bank facilitates the maintenance of price stability by regulating the balance sheet structure of banks (more than one objective – more than one instrument).

In this paper, we take account of the traditional theories on interest rates (as proposed by the mainstream) and set them against the post-Keynesian, modern interpretation. The main focus of the new consensus is Wicksell’s assertion that central banks align their interest rate decisions with the natural equilibrium rate of interest. The post-Keynesian approach disputes this. *Lavoie* points out that the biggest difference between the post-Keynesian approach and the new consensus – which also accepts the endogeneity of money supply – is the post-Keynesian rejection of the natural rate of interest (*Lavoie 2014:190*).

3. On Irving Fisher's interest rate theory

Views on the determination of the interest rate are extremely diverse among the dominant trends of economics, but they have a common feature. Most approaches fall in the scope of real analysis. The theory focuses on the *equilibrium* interest rate, which is essentially determined by real factors in a state of equilibrium; monetary components can only influence the exceptions, i.e. the market rates. Monetary policy refers to the equilibrium interest rate as the *neutral* interest rate, because it corresponds to an interest level where output resides precisely at its potential level, and the interest level does not give rise to either inflationary or deflationary pressures.

In simplified terms, the school of economics built on the exclusivity of real analysis assumes an economy where financial flows merely facilitate a simpler and more flexible exchange, but money has no effect on the emergence of equilibrium proportions. Financial instruments only play a role in executing, intermediating or facilitating the exchange. It was in this conceptual framework that American economist Irving Fisher formulated one of the most thoroughly developed forms of classical interest rate theory, which has continued to be influential up to today.

Fisher's interest rate theory proceeds from the notion that each economic unit can maximise its welfare intertemporally (across different periods) by adjusting its preferred consumption to its intertemporal real income (*Fisher 1907, 1930*). If it consumes less in one period than what could have been permitted by its income, it will purchase financial instruments (or grant credit) from its saving. In the reverse case, if it is to consume more than its present income, it needs to sell assets from its portfolio (or borrow). The purchase and sale of portfolio elements are aimed at return maximisation. The institutional unit can achieve this by managing its yield-producing financial portfolio, for instance, by holding cash or bonds. It purchases high-return elements and sells low-return items. As a result of this process, the yields ultimately equalise in the market as demand for high-return instruments increases their price, which in turn lowers the return on investments in the given instruments.¹

¹ Consider an instrument purchased at the cost of 100 unit yields 10 units each year (10 per cent). An increase in the price of this instrument (say, now it cost 200) secures a significant return for the seller, but the investor's (new owner's) return still remains 10, which translates to a mere 5 per cent for his 200 units of investment.

The equilibrium real return emerging in the market is called the *natural rate of interest*² in the theory. This is commonly denoted by r^* . The market interest rate of the financial instruments is denoted by i . In Fisher's interpretation, i represents the impatience of individuals, i.e. the time preference, while r denotes the investment's rate of return over the costs of the investment (Fisher 1930:280). In the case of intertemporal welfare maximisation, in a state of equilibrium the correlation between the nominal yield of the financial instrument (the interest on the loan) i and the natural (real) rate of interest r^* will be:

$$i_t = r_t^* + E_t(\pi) \quad (1)$$

where $E_t(\pi)$ denotes future inflation expectation at time t .

According to Fisher's theory, if – out of the variables in equation (1) – i was smaller than $r_t^* + E_t(\pi)$, this would signal that the cost of borrowing is lower than the nominal return on the investment in the real asset. In that case the investment should be financed from borrowing. In parallel with the growth in investment, however, inflation accelerates as rising demand raises the price of capital goods. Based on equation (1), at this point the rise in inflation will continue to push up the nominal interest rates until the equilibrium is restored. In the reverse case, however, when the nominal interest rate (i) is higher than the return on investment, credit demand drops and with the downturn in purchases from credit, inflation keeps decelerating until the equilibrium is attained. In Fisher's above-mentioned interest theory, the *nominal interest rate (i) adjusts to term $r_t^* + E_t(\pi)$ on the right-hand side of equation (1)*. Nominal interest, therefore, depends on factors appearing on the right-hand side of the equation, which essentially depend on real variables; this is why this theory is referred to as the *real theory of interest*.

In Fisher's work, a prominent role is assigned to real categories related to such human behaviour as impatience, self-control, responsibility for future generations or fashion, all of which are factors with a bearing on consumption behaviour (Fisher 1930:284). Foresight is yet another such trait, which helps to rein in expected inflation, whereby the monetary category of inflation can be incorporated into the real analysis of the economy.

² Over the past 100 years, the concept of the natural rate of interest evolved in line with the changes in capital, money, credit and value theories. The interest rate theory based on the intertemporal maximisation of consumption is traced back to Fisher (1930). This has remained the mainstream to date. The first order maximum condition of intertemporal consumption maximisation is defined by the Euler equation: , where present consumption (c) is the decreasing function of the real rate of interest (r), and the rate of the decrease depends on the elasticity of the intertemporal substitution (σ) and the discount rate of the population (ρ). Numerous aspects of consumer decision are still subject to intensive research. Cohen et al. (2016) provide a broad overview on the topic in the context of the interest rate, focusing on the issues of discounting and time preference.

4. A critique on Irving Fisher's interest rate theory

It is a long-standing view in economics that Fisher's real interest rate category, which leads to the equilibrium or neutral interest rate, is the basis of central bank operation and captures the very essence of inflation targeting. It suggests that central banks should solely and exclusively focus on inflation, which can be best achieved if the central bank adjusts the key policy rates to the equilibrium interest rate, which in turn is determined by the equilibrium of saving and investment. Milton Friedman exacerbated this misconception by proposing a rule on money growth with a view to achieving this goal, one that may further it even without any interference from central banks. We will return to the central bank's role and key responsibility in shaping the interest rate later. We now intend to analyse Fisher's theoretical ideas in the context of their own internal logic rather than from the conclusions that can be drawn from them in relation to monetary policy.

Tymoigne (2006) analyses in detail the criticism and arguments against Fisher's interest rate theory, among them those voiced by *Keynes (1965)*, *Harrod (1971)* and *Davidson (1986)*. It proceeds from the Fisher equation in equation (1) that, since the size of the equilibrium real interest rate (r^*) is assumed given – and determined by the structure of the economy) – the evolution of the nominal interest rate (i) is determined by the developments in inflation. Based on Fisher, the dynamics of the process are guided by the following arbitrage mechanism: suppose we are in a state of equilibrium where the nominal interest rate coincides with the equilibrium rate, but the central bank is expected to generate inflation by expanding the money supply. In such a scenario, equation (1) dictates an immediate rise in the nominal interest rate in the market in response to the increase in inflation expectations. Keynes rejected this mechanism for three reasons (*Tymoigne 2006:3*). The first criticism pointed out that it is only the nominal interest rate that is known to decision-makers as this is the only observable variable in equation (1). A rise in this rate results in a capital loss on bond investments, which was not taken into account in equation (1) whatsoever. Keynes's second objection was related to the fact that changes in capital assets (investment) and consumption (savings) were inversely related to what had been assumed by Fisher. Keynes stressed that resigning from consumption due to the high level of interest rates (higher saving) *does not translate into* investment growth. If anything, it gives rise to the exact opposite as a decline in demand has a negative impact on investment. Keynes's third criticism of Fisher's explanation was that the present/future consumption arbitrage studied by Fisher does not support a direct relationship between changes in inflation and the interest rate. A hike in the interest rate reflects the increase in *uncertainty* in response to rising inflation, and not the yield sacrifice. Increased

uncertainty prompts individuals to adjust the proportion of liquid and illiquid instruments in their portfolio. Uncertainty raises the importance of liquid assets in itself, and balance between the two asset groups can only be restored in a higher interest rate environment.

The global economic crisis of 1929–1933 and the phenomenon of over-indebtedness were assigned great significance in Fisher’s work, and the author’s clear understanding of the issue is evident even by contemporary standards (*Fisher 1933, Shiller 2011*). It is all the more ironic that what made Fisher infamous was an ill-conceived statement published in the 22 October 1929 edition of the *New York Times*, in which he encouraged investors to buy stocks as the prices were extremely low. Two days later the stock market crashed. Analysing the fundamental value of corporate equity, *McGrattan – Prescott (2001)* found that Fisher had been right after all, in that stocks were undervalued at the time, as even at the peak equity prices were low relative to their fundamental (real) value. This, however, also means the failure of the theory based on real analysis, pointing out the inadequacy of real analysis in relation to such money market phenomena as a financial crisis.

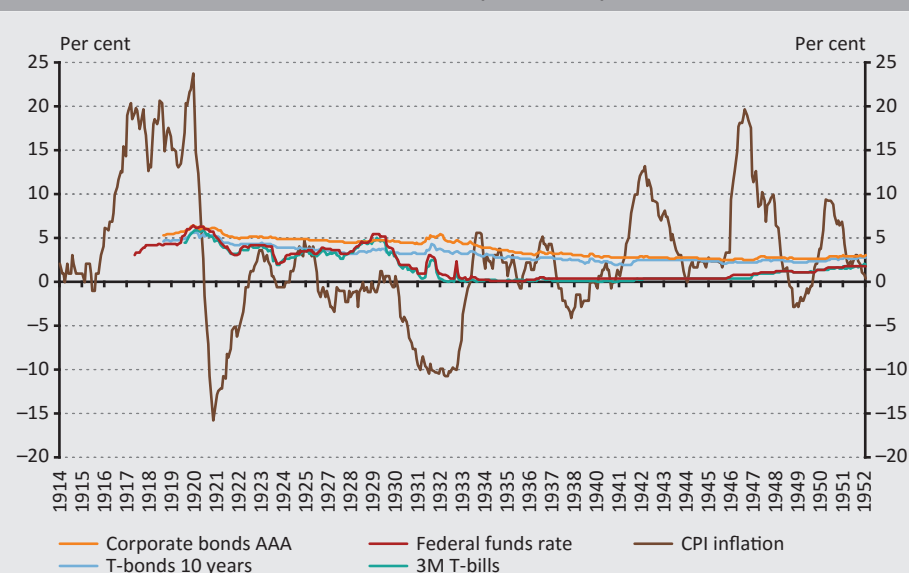
Real analysis promotes the equilibrium attained by way of outputs derived from a perfectly competitive market and the rational calculation of policymakers. It proposes that government interventions or regulatory constraints only hamper the emergence of the equilibrium, generating instability. As is the case with market price signals, the central bank should not interfere with the evolution of the interest rate either. It is a widely held idea that one of the causes of the global crisis was the fact that the US Federal Reserve kept the interest rates unnecessarily low for too long, giving rise to rampant speculative investments. This notion was ridiculed by *Tymoigne (2017)* when, following the steps of real analysis he argued that interest rates should be left to be determined by market forces. However, economic participants should be left alone to make a rational calculation to decide whether it is worth investing in a business, education or healthcare; in any area where the marginal benefit outweighs the marginal cost. If the high interest level signals that the return on the investment underlying the individual’s financial welfare is insufficient, a rational individual would be content not to own a house or not to go to university because it is not beneficial in the current interest rate environment.

5. The empirical explanatory power of Fisher's interest rate theory is dubious

Based on equation (1), which describes the correlation between the market rate, the equilibrium interest rate and inflation expectations, one would think that a close correlation can be observed between inflation and the interest rate. We do not assume that the equilibrium interest rate fluctuates much, while the observable interest rate and observable inflation are less stable. As *Figure 1* demonstrates, there is no evidence of this correlation in the data of the US economy pertaining to Fisher's era, i.e. the years preceding World War II.

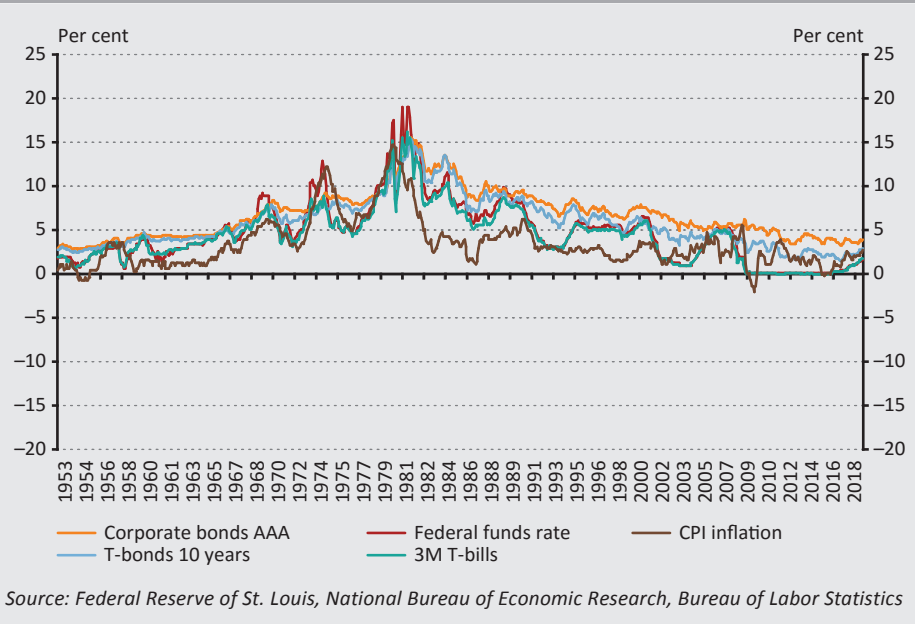
Tymoigne (2006) analysed the correlation between the interest rates and inflation using several methods and found evidence of an extremely weak relationship between these variables in the US economy in the period preceding 1953. After 1953 the Fed's monetary policy changed noticeably, and it often used the federal funds rate to influence inflation and employment. As a result, a close correlation started to develop between interest rates and inflation (*Figure 2*). This correlation, however, cannot be viewed as evidence in support of Fisher's theory. Driven by market mechanisms, interest rates do not tend to be affected by inflation unless the central bank moves its interest rates as a function of inflation (*Tymoigne 2006:31*).

Figure 1
Yields on corporate bonds and government securities of various maturities vs. federal funds rates and inflation in the USA (1914–1952)



Source: Federal Reserve of St. Louis, National Bureau of Economic Research, Bureau of Labor Statistics

Figure 2
Yields on corporate bonds and government securities of various maturities vs. federal funds rates and inflation in the USA (1953–2018)



6. Keynes's theory of interest and money: liquidity preference and financial conditions

Maintaining liquidity and solvency is crucial for the finances of businesses. Businesses interpret economic effectiveness in nominal, rather than real terms. This affects a number of variables, such as the interest rate. In this approach, the rate of interest is a reward for realigning the portfolio towards illiquid assets rather than for saving. Businesses base their investment decisions on their expected future cash flows, in which the interest rate is not the only – and not even the most important – factor. The classical theory of interest – as represented by Fisher's previously discussed real-theory – is not applied by practitioners as it does not reflect the financial interrelationships that have key importance in their everyday decisions.³

Keynes's liquidity-preference theory of interest shows a great deal of similarity to Fisher's interest rate theory. Both Keynes and Fisher argue that economic units rearrange their portfolios in such a way that they strive to hoard high-return assets and try to shed low-return ones. This realignment (arbitrage) will continue until the returns equalise in the market. However, there is a significant difference of

³ Szalai (2015) provided a valuable assistance in the assessment of Keynes's theory of interest.

opinion between them. Keynes, as opposed to Fisher, based his arguments on the nominal return on financial instruments instead of the real return on real assets (Kollarik – Szalai 2017). In Keynes's theory the nominal interest rate "anchors" the system. This is a very important difference from the approach of the mainstream.

Another important difference is that, while there is no need for a money theory for the determination of the interest rate in a theory placed in a real analysis framework, Keynes's arguments presuppose the theory of money. In his works, Keynes's views on money changed over time, and his theory of money took several approaches. For the purposes of this paper, we rely on the *General Theory* and on the interpretation presented in Hicks (1937) to demonstrate that interpreting Keynes' thoughts in the IS–LM framework leads to a misleading view.

According to the IS–LM approach, the IS curve represents the equilibrium between saving and investment. In the understanding of classical economics (and also of the contemporary mainstream), this means that the equilibrium interest rate is determined by the attainment of an equilibrium between saving and investment. An increase in the inducement to invest relative to saving will tend to raise the rate of interest, which in turn will reduce the inducement to invest and increase savings. It is important to see that in this approach, both saving, and investment are *flow* variables. This interpretation is entirely alien to Keynes. Reinterpreting Keynes's key concepts, the mainstream inserted them into real analysis, with utter disregard for the fact that Keynes had been engaged in monetary analysis and, like Schumpeter, rejected the procedure of the mainstream. In order to illustrate how incongruous this textbook interpretation is with the Keynesian interest rate theory, we need only to point out that it refers to *flow* linkages, whereas Keynes's theory of interest is built on *stock* categories. One of his key categories, liquidity – as monetary stock – is a *stock variable*. The discrepancy arising from the use of *stock* and *flow* variables is only one of many significant differences between the two theories. In the following, we address the interpretation differences between saving and investment in more detail.

Another important deviation from mainstream ideas is the fact that Keynes's model rests on the idea of effective *demand* (Taylor 2010). By contrast, the currently dominating neoclassical, traditional interpretation of economics postulated that domestic income is determined by the *supply* side, by full employment of all inputs into production. Households freely decide how much of their incomes to save or consume and according to mainstream economics, investment must adjust to meet this available saving. In other words, investment fills the gap created in demand by saving. The theory resting on this assumption cannot tackle situations where the banking sector is unable to extend loans and households are forced to hoard their savings, causing a sharp jump in their propensity to save, while businesses see no investment opportunities amid collapsing demand and seek to reduce their debts instead. In other words, investment is unable to fill the gap created by increased

saving between supply and demand (*Taylor 2010:5*). Nonetheless, such situations may occur from time to time, as is the case in times of most financial crises.

Keynes's ideas crystallised while he was seeking to solve practical problems, and the change can be traced across the publications of his findings. Undoubtedly, the way he formulated his ideas was misleading at times, which led to numerous misinterpretations of his theory of interest down the road. He nevertheless clarified his thoughts in debates, and his theory of interest can be grasped more clearly in the series of debates published in several 1937 issues of *The Economic Journal* under the title "Alternative Theories of the Rate of Interest" (*Keynes 1937a, 1937b; Ohlin et al. 1937*). The theory is also discussed in detail in Chapter 17, "The essential properties of interest and money" of the *General Theory* (*Keynes 1965*).

Keynes's theory of interest rests on the concept of liquidity preference, and he deduces the interest rate from the evolution of asset prices. In the case of all assets, the expected return depends on several factors. These factors are captured by the formula presented in Chapter 17 of the *General Theory*, according to which the total return expected from the ownership of an asset consists of four main components: $q - c + l + a$, where q is the asset's expected yield, c is its carrying cost, l is its liquidity premium and a stands for its expected appreciation/depreciation. Keynes maintains that in the case of the most liquid assets (money) the yield derives from l while all other components are negligible by comparison (*Keynes 1965:251*).

Asset prices may change in line with changes in the liquidity preference. A fall in liquidity preference affects the demand for liquid assets (cash) the most, as their valuation suffers the sharpest decline. After providing an overview of this theory, *Wray (2004)* emphasises that Keynes did not mean to imply that liquidity preference is the only factor determining asset prices or that the above formula covers all factors. It is still clear, however, that he presented assets as *stock*, rather than flow, *variables*.⁴

Liquidity preference may change for various reasons, and this also affects the market interest rate. However, we have no reason to assume that an interest rate which reflects liquidity preference coincides with the equilibrium interest rate between the demand for investment and the supply of savings, as claimed by real analysis.

⁴*Foley (1975)* analysed the two specifications proposed by macroeconomic models: the stock and flow specifications, where stock formulations mean "beginning-of-period", while flow formulations mean "end-of-period". Under certain conditions, the two approaches are equivalent. This is the case when perfect foresight is assumed in the flow specification. According to the intuitive approach, we reach the end of the period from the stock specification describing the beginning of the period by adding flow values to the latter. Here, however changes in stock values are also a part of the flow. Accordingly, assuming perfect foresight of the prices/rates, the stock and flow specifications become equivalent. Notwithstanding this equivalence, *Foley (1975)* also calls attention to the significant differences in interpretation. *Foley (1975:320–321)* demonstrates that in the debate between *Keynes (1937a)* and *Ohlin (Ohlin et al. 1937)* with respect to the interest rate, *Ohlin* argues in accordance with the flow approach, whereas *Keynes* presents his thoughts in the context of the stock specification. This is the reason behind the clash in their views, even though in reality they propose equivalent assertions.

7. On Keynes's views on real variables

Presenting Keynes's views on real variables, *John Weeks* emphasised that, owing to the dichotomy between real and monetary variables, classical economics failed to integrate relative prices – thus the interest rate – with the theory of money (*Weeks 1998:270*). Keynes's own words help shed light on this statement: "So long as economists are concerned with what is called the theory of value, they have been accustomed to teach that prices are governed by the conditions of supply and demand; and, in particular, changes in marginal cost and the elasticity of short-period supply have played a prominent part. But when they pass in volume II, or more often in a separate treatise, to the theory of money and prices, we hear no more of these homely but intelligible concepts and move into a world where prices are governed by the quantity of money, by its income-velocity, by the velocity of circulation relatively to the volume of transactions, by hoarding, by forced saving, by inflation and deflation *et hoc genus omne*; and little or no attempt is made to relate these vaguer phrases to our former notions of the elasticities of supply and demand. If we reflect on what we are being taught and try to rationalise it, in the simpler discussions it seems that the elasticity of supply must have become zero and demand proportional to the quantity of money; whilst in the more sophisticated we are lost in a haze where nothing is clear and everything is possible." (*Keynes 1965:317*)⁵

8. Different interpretations of saving and investment in real analysis and monetary analysis

The neoclassical mainstream applies the interest rate to bring saving in line with investment; in other words, if saving is low compared to investment preference, credit demand will raise the interest rates. The interest hikes, in turn, will increase saving and reduce investment preference and hence, credit demand. As a result, an interest rate will emerge in the market that results in a level of saving that coincides with the investment preference of the economy. This argument does not seem flawed; indeed, both investment and saving are flow type variables. In this interpretation, the theory addresses real variables rather than financial variables, given that both the total output invested and savings as non-consumption are real variables. *In the real theory, the amount of saving determines the amount of investment.*

Keynes, however, does not determine the interest rate on this basis; he uses the *liquidity preference* between money and bonds for this purpose. While cash bears no interest, when invested in bonds, it will yield a higher return. It depends on the level of the interest rate what part of its liquidity the private sector is willing to part with for the sake of interest income. Notably, Keynes makes no mention

⁵ Keynes's text is available on page 185 at <https://cas2.umkc.edu/economics/people/facultypages/kregel/courses/econ645/winter2011/generaltheory.pdf>

of investment in his theory of interest. In this argument we work with financial variables. Liquidity and money are active participants. The interest rate is influenced by the demand for liquidity as a *stock* variable. The *stock-flow* distinction acts as a watershed here: as a flow variable, investment cannot mix with this interest rate definition. The same applies to saving, which is also understood as a flow variable.⁶

The interest rate evolves irrespective of investment; investment preferences adjust to the interest rate emerging in the market. However, once investment is determined through the interest rate, it also means that saving has also been determined. Investment is the excess saving from the total output (income) over consumption. *In monetary analysis, the investment determines the ultimate size of the saving.*

It should be stressed that the difference between real and monetary analysis does not stem from different interpretations of the concepts. Under the monetary approach, the concept of saving – as a flow variable – indicates total output, just as in real analysis: the total output over consumption. Measuring and aggregating total output is equivalent to the determination of aggregate income under both approaches. Both real analysis and monetary analysis use income categories with the same content and definition, but the correlations between them can differ significantly. In real analysis an increase in saving reduces the interest rate and leads to an increase in investment. Under the monetary approach, an increase in saving reduces demand, but it has no effect on investment finance or the interest rate, as investment is not financed from current year savings, while the interest rate is determined by liquidity preference, a stock rather than a flow variable of the annual saving.

9. On the problems of the IS–LM illustration

The theory assumes the saving (S) and investment (I) curves – which play a key role in the real approach of mainstream economics – are independent, and that the equilibrium materialises at their point of intersection. In reality, saving and investment are not independent. More investment also contributes to GDP growth through the increase in investment demand. Increased income, in turn, raises savings. Higher aggregate investment yields higher savings.

It is by no accident, then, that Keynes's analysis is founded on the rejection of real analysis; in formulating his theory, he seeks to avoid all real variables and focuses his attention on the concepts of money and employment.

Keynes's theory of interest has been widely criticised for, among other things, its inconsistency, and even the mainstream ignored it. *Appelt (2016)* provided a broad

⁶ In classical economics, saving is understood as the difference between annual current income and current consumption, i.e. as a flow variable. By contrast, as used in everyday language as well as in business vernacular, saving means a previously accumulated stock kept in the bank or held in financial assets.

overview of the critiques and in summary, he found that Keynes's theory of the rate of interest is far-reaching as regards its implied consequences. For instance, a "free market does not ensure an efficient allocation of resources. The intervention of the state is necessary to prevent excessive savings that could lead to unemployment. The rate of interest is the chief tool of such an intervention" (Appelt 2016:7). The approach focusing on a perfect free market discards this thought entirely, and understandably so. In his summary of Keynes's professional career, Szakolczai (2016) attributes Keynes's neglect following his death to the mainstream's propensity to disregard the facts. As the author put it: "What Keynes had hoped for did not come to fruition; indeed, the facts of the world today are contrary to Keynes's vision. The principles proposed in *General Theory* (...) are rejected by current mainstream economics. (...) As a result, unemployment has not been eliminated; it continues to increase (...); income and wealth disparities have not lessened but escalated, and the state's economic policy not only failed to restrain this process but in fact facilitated it. Public control over investment not only has not been extended but it weakened, and current mainstream economics clearly condones this trend" (Szakolczai 2016:853–854).

Keynes's career was practice-oriented; he participated in the daily work of governmental bodies continuously, and his theoretical ambitions were all aimed at analysing the problems arising in this environment. This approach is also reflected in his attitude to classical economics, which he summed up as follows: "Our criticism of the accepted classical theory of economics has consisted not so much in finding logical flaws in its analysis as in pointing out that its tacit assumptions are seldom or never satisfied, with the result that it cannot solve the economic problems of the actual world." (Keynes 1965:402). The classical and subsequently, the neoclassical school's response to this was an attempt to prove, through a number of theoretical refinements, that the implementation of the programme envisioned by Keynes was not even necessary. The framework of this reconciliation was outlined by Hicks (1937), and the subsequent unfolding of the IS–LM approach made it appear as if it were the integration of Keynesian economics into the classical framework, even though it retained numerous elements that were clearly defied by Keynes. It was in an overview of these developments that Tily (2007) and Chick – Tily (2014) called the evolution of the theory a betrayal of Keynes's thought.

We have already voiced a number of objections in regard to the IS side of the IS–LM approach. The LM side is also not devoid of problems. The main trouble in this regard is that broad money is deemed to be an exogenous variable that can be controlled by the central bank. In reality, it is determined endogenously, and the central bank can control only a small part of it at most. In the LM approach, money supply dominates while money demand plays no role at all, even though it is precisely credit demand that gives rise to changes in the quantity of money in the *endogenous theory of money*.

10. Endogenous money – exogenous interest rate

To put it simply, the debate between Keynes and classical economists is rooted in the fact that while classical economists examine the way in which the nominal interest rate can be derived from the equilibrium real interest rate, Keynes recognised that the equilibrium real interest rate is merely a theoretical creation of real analysis, which has no practical relevance in reality; consequently, it should not be a starting point for arguments regarding the nominal interest rate. In Keynes's liquidity-preference theory of interest, the equilibrium real interest rate does not appear at all. In his *Treatise on Money* (1930), Keynes's view was still close to *Wicksell's* natural interest rate concept, which was defined as the equilibrium between saving and investment. In *General Theory*, however, he firmly rejected this view after having recognised that this equilibrium may emerge at numerous income (employment) levels, and he was only concerned with full employment equilibrium. He wrote: "In my *Treatise on Money* I defined what purported to be a unique rate of interest, which I called the natural rate of interest – namely, the rate of interest which, in the terminology of my *Treatise*, preserved equality between the rate of saving (...) and the rate of investment. I believed this to be a development and clarification of *Wicksell's* 'natural rate of interest', which was, according to him, the rate which would preserve the stability of some, not quite clearly specified, price-level. (...) I am now no 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. It is merely the rate of interest which will preserve the status quo; and, in general, we have no predominant interest in the status quo as such." (*Keynes 1965:266*).

What sets Keynes's theory apart from the classical school is the essential difference between real analysis and monetary analysis: his views on money with regard to its impact on economic processes. A direct consequence of this is the difference between the interpretation of equilibrium and the interpretation of equilibrium in the context of full employment. Another difference concerns the theory of money, in particular, the key role of liquidity preference in the determination of the interest rate and, in relation to money creation, the key role of credit; in other words, the recognition of the commercial banks' role in endogenous money creation. *Ábel et al. (2016)* provide an overview of the contradictory treatment of banks and money in traditional macroeconomics and demonstrate the practical significance of the theory of endogenous money in the face of mainstream economics. However, the authors do not address the Keynesian roots of the theory of endogenous money or the determination of the interest rate. *Pilkington (2014)* refers to the theory of endogenous money as the crowning jewel of post-Keynesian theory. The revival of the theory of endogenous money in the wake of *Basil Moore's (1988)* influential work emphasised that the money supply curve

is horizontal as opposed to being vertical as assumed by the classical approach (*horizontalism* versus *verticalism*). By now, however, even the mainstream view has integrated horizontalist considerations.⁷ The essential difference, therefore, is not that by embracing the theory of endogenous money central banks gave up their fruitless attempts at determining the money supply and allowed it to be shaped by externalities independent of them. As *Palley (2006)* pointed out, endogeneity – which the author refers to as “central bank endogeneity” – is fundamentally different from the theoretical foundation of the theory of endogenous money, which believes in endogenous money creation through credit. *Palley (2006:80)* terms this as the “endogeneity of finance”. We refer to the theory of endogenous money in this sense.

Bindseil – König (2013) re-evaluated the work of Basil Moore 25 years later, and found that his book had impressively stood the test of time.⁸ Simplifying the difference between Moore and the mainstream to the horizontalist–verticalist conflict, we can state that in the traditional verticalist view money supply is exogenous, independent of money demand (business considerations), and is controlled by the central bank within reasonable limits. By contrast, in our view Moore’s horizontalist theory offers a realistic description of money creation where it is linked to bank credit. Bank credit, in turn, depends on credit demand. The central bank may influence the “price” – i.e. the lending rates – at most, but money supply (the credit volume) is not determined by the central bank: it is determined by credit demand, which depends on business considerations. The verticalist paradigm may apply in a world of commodity or pure fiat money. But to provide a correct description of a credit economy, the horizontalist view should be adopted (*Bindseil – König 2013:384*).

The endogeneity of money supply means that, in addition to the money created by the central bank (state), the market creates fiat money endogenously as well, for example, when a commercial bank extends a loan. Money created by the state is outside money, while endogenously created money is inside money. In the modern market economy, the weight of inside money in payment transactions is overwhelming – in excess of 90 per cent – compared to cash (outside money).

In *Wray’s (2004)* simplistic wording, the exogeneity of the interest rate means that the central bank can shape the interest rate using administrative means

⁷ “We are all Horizontalists now!”, declares the title of an interview conducted with Basil Moore (*Moore 2010*).

⁸ As the work of Basil Moore had been largely ignored, it took years for central banks to move, learning from their own experience, in the direction that had already been analysed by Moore with impressive precision. Although *Bindseil (2004)* cites *Moore’s (1988)* book in his seminal work discussing the frameworks of monetary policy instruments, it took 25 years for him to recognise that Moore had correctly identified the development trend and main features of contemporary central bank instruments (*Bindseil – König 2013:387, Footnote 1*).

(unilaterally).⁹ The set of instruments and institutional structure of monetary policy exert a profound impact on the interest rate – including the rates they affect directly – and on monetary policy transmission, i.e. the way in which this passes through to the rest of the money market interest rates and to the other features of the market (such as inflation).

However, the discretionary power of central banks in regard to the determination of the interest rate is limited: it does not cover all types of interest and it is not equally valid at all times. The central bank exerts the most direct impact on the short-term interest rate, i.e. the key policy rate. Depending on the structure of the set of monetary policy instruments, the “key” qualifier may mean various interest rates. For most central banks, this is the overnight instrument, which directly affects developments in the overnight interbank lending rates.

11. What determines the nominal interest rate?

The post-Keynesian practice explains the operation of monetary policy by describing the daily operational procedures and processes of central banks. A consequence of this pragmatic approach is the fact that the post-Keynesian theory approximates current practices better. In describing the daily practice of the central bank, many authors have adopted the distinction used by *Alfred S. Eichner (1987)* regarding the central bank’s “protective” and “accommodative” functions. The day-to-day – indeed, minute-by-minute – management of market liquidity is the protective function. The central bank monitors – and facilitates the smooth management of – the liquidity shocks emerging in foreign exchange markets and internal money markets and the volatile swings in the financial flows and payment transactions of various economic participants, the government and the private sector. Another, longer-term element of the central bank’s interest rate shaping activity is the enforcement of monetary policy objectives and principles and long-term changes in economic processes. This is the responsibility covered by Eichner’s reference to the accommodative function of central banks. However, the central bank not only accommodates to changes in the business cycle, it also intervenes proactively therein by way of its monetary policy and in the interest of furthering its own goals. This fits fairly well within the post-Keynesian theoretical framework of monetary policy.

⁹ *Wray (2004)* quotes the three most commonly used interpretations of the exogenous variable: (1) In the control sense, an exogenous variable is one whose value is set by government policy. (2) In the theoretical sense, the exogenous variable in a model is assumed to cause changes in the endogenous variables, but not the other way around: exogenous variables are independent of the endogenous variables. (3) In the statistical sense, an exogenous variable is one which is independent of the explanatory variables of a tested model. For the purposes of this paper, we apply the first interpretation. It is worth quoting Basil Moore’s words voiced in an interview on the subject: “Nothing is really exogenous, even interest rates, because central banks will always react to economic conditions. (...) In that sense interest rates always have an endogenous component.” (*Moore 2010:9*). Accordingly, the first interpretation is not about when and why the central bank adjusts the interest rate; it merely states that the interest rate is determined by the central bank.

In general, central banks can influence nominal interest rate developments most efficiently across short-term maturities. Central banks play a dominant role in shaping the interest rate; in fact, they define the interest rate and have a wide array of instruments at their disposal to enforce the chosen interest rate in the market. By selecting and applying their regulatory tools, central banks have a significant impact on developments in market rates as well.

Obviously, a change in short-term interest rates also affects longer-term interest rates, but this impact is only indirect. Other than the application of non-conventional quantitative measures mostly in crisis periods, central banks can exert an influence on long-term interest rates through macroprudential, resolution or credit market regulations. The minimum requirement pertaining to regulatory capital and to liabilities eligible for write-down or conversion (MREL) and the macroprudential regulation on liquidity indicators affect commercial banks' lending activity – and hence, money creation – fundamentally. *Li et al. (2017)* present an interesting model calculation in regard to the latter.

12. Summary and conclusions

The interest rate is one of the key variables of economics. In traditional economics, the argument founded on intertemporal optimisation asserts that sooner or later, all material processes in the operation of the economy are bound to converge to the natural rate of interest. The core part of this theory is rooted in Fisher's theory of interest. In this paper, we demonstrated that this interest rate theory is one of the key elements of the real analysis framework of traditional economics. The theory that was built on this foundation, however, is not supported by data, and the traditional theory with this in its focus is not suitable to analyse the processes of the contemporary economy. Comparing it against real analysis, we present monetary analysis, which was first formulated in Schumpeter and Keynes's work and progressed – through the theory of fiat money – to the theory of endogenous money. In this framework the interest rate is determined by the central bank as opposed to the market. The theory of endogenous money underpinned the process of money creation, commercial banks shape the money supply through their lending activity in accordance with market demand, and the weight and significance of the central bank's creation of outside money had become secondary. The interest rate lost its primary role in the monetary policy of modern central banks. Although the interest rate is defined by the central bank, the central bank no longer controls money creation through this channel. For the purposes of endogenous money creation (lending), the design and operation of liquidity regulating central bank instruments and micro- and macroprudential regulations fulfil the exact same role as the measures used by traditional-minded central banks with a view to shaping the interest rates.

References

- Ábel, I. – Lehmann, K. – Tapaszti, A. (2016): *The controversial treatment of money and banks in macroeconomics*. Financial and Economic Review, 15(2): 33–58. <https://en-hitelintezetiszemle.mnb.hu/letoltes/istvan-abel-kristof-lehmann-attila-tapaszti-en.pdf>
- Appelt, K. (2016): *Keynes' Theory of Interest Rate: A Critical Approach*. Theory, Methodology, Practice, 12(1): 3–8. <https://doi.org/10.18096/TMP.2016.01.01>
- Bindseil, U. (2004): *Monetary Policy Implementation*. Oxford: Oxford University Press.
- Bindseil, U. – König, P.J. (2013): *Basil J. Moore's Horizontalists and Verticalists: An appraisal 25 years later*. Review of Keynesian Economics, 1(4): 383–390. <https://doi.org/10.4337/roke.2013.04.01>
- Blinder, A.S. (1997): *A core of macroeconomic beliefs*. Challenge, 40(4): 36–44. <https://doi.org/10.1080/05775132.1997.11471984>
- Chick, V. – Tily, G. (2014): *Whatever happened to Keynes's monetary theory?* Cambridge Journal of Economics, 38(3): 681–699. <https://doi.org/10.1093/cje/beu011>
- Cohen, J.D. – Ericson, K.M. – Laibson, D. – White, J.M. (2016): *Measuring Time Preferences*. National Bureau of Economic Research Working Paper 22455. <https://doi.org/10.3386/w22455>
- Davidson, P. (1986): *A Post Keynesian view of theories and causes for high real interest rates*. Thames Papers In: Political Economy, Spring. Reprinted in Davidson, L. (ed.): *The Collected Writings of Paul Davidson*, vol. 1. New York: New York University Press, 1991.
- Eichner, A.S. (1987): *The Macrodynamics of Advanced Market Economies*. Armonk, N. Y.: M. E. Sharpe.
- Fisher, I. (1907): *The Rate of Interest*. New York: Macmillan.
- Fisher, I. (1930): *Theory of Interest, as determined by Impatience to Spend Income and Opportunity to Invest it*. New York: Macmillan.
- Fisher, I. (1933): *The Debt Deflation Theory of Great Depressions*. Econometrica, 1(4): 337–357. <https://doi.org/10.2307/1907327>
- Foley, D.K. (1975): *On Two Specifications of Asset Equilibrium in Macroeconomic Models*. Journal of Political Economy, 83(2): 303–324. <https://doi.org/10.1086/260324>
- Harrod, R. (1971): *Discussion paper*. In: Clayton, G. – Gilbert, J.C. – Sedgwick, R. (eds.): *Monetary Theory and Monetary Policy in the 1970s*. Oxford: Oxford University Press.
- Hicks, J.R. (1937): *Mr Keynes and the "Classics": A Suggested Interpretation*. Econometrica, 5(2): 147–159. <https://doi.org/10.2307/1907242>

- Keynes, J.M. (1930): *A Treatise on Money*. MacMillan & Company, London, UK.
- Keynes, J.M. (1937a): *Alternative Theories of the Rate of Interest*. The Economic Journal, 47(186): 241–252. <https://doi.org/10.2307/2225525>
- Keynes, J.M. (1937b): *The “Ex-Ante” Theory of the Rate of Interest*. The Economic Journal, 47(188): 663–669. <https://doi.org/10.2307/2225323>
- Keynes, J.M. (1965): *A foglalkoztatás, a kamat és a pénz általános elmélete (The General Theory of Employment, Interest and Money)*. Közgazdasági és Jogi Könyvkiadó, Budapest.
- Kollarik, A. – Szalai, Z. (2017): *The 2008–2009 crisis and the new international economic environment*. In: Lehmann, K. – Palotai, D. – Virág, B. (ed.): *The Hungarian Way – Targeted Central Bank Policy*. Magyar Nemzeti Bank, Budapest, pp. 27–71.
- Lavoie, M. (2004): *The New Consensus on Monetary Policy Seen from a Post-Keynesian Perspective*. In: Lavoie, M. – Seccarecia, M. (eds.): *Central Banking in the Modern World: Alternative Perspectives*. Cheltenham: Edward Elgar, pp. 15–34.
- Lavoie, M. (2014): *Post-Keynesian Economics. New Foundations*. Edward Elgar. Cheltenham, UK, Northampton, MA, USA.
- Li, B. – Xiong, W. – Chen, L. – Wang, Y. (2017): *The impact of the liquidity coverage ratio on money creation: A stock-flow based dynamic approach*. Economic Modelling. 67(December): 193–202. <https://doi.org/10.1016/j.econmod.2016.12.016>
- McCallum, B.T. (2001): *Monetary policy analysis in models without money*. Federal Reserve Bank of St. Louis Review, 83(4): 145–159. <https://doi.org/10.20955/r.83.145-160>
- McGrattan, E.R. – Prescott, E.C. (2001): *The Stock Market Crash of 1929: Irving Fisher Was Right*. NBER Working Paper No. w8622. <https://doi.org/10.3386/w8622>
- Moore, B. (1988): *Horizontalists and Verticalists: The Macroeconomics of Credit Money*. Cambridge University Press, Cambridge.
- Moore, B. (2010): *We are all Horizontalists now!* Interview. European Journal of Economics and Economic Policies: Intervention, Edward Elgar Publishing, 7(1): 7–11. <https://doi.org/10.4337/ejeep.2010.01.01>
- Ohlin, B. – Robertson, D.H. – Hawtrey, R.G. (1937): *Alternative Theories of the Rate of Interest: Three Rejoinders*. The Economic Journal, 47(187): 423–443. <https://doi.org/10.2307/2225356>
- Palley, T.I. (2006): *A Post-Keynesian framework for monetary policy: why interest rate operating procedures are not enough*. In: Gnos, C. – Rochon, L.-P. (2006): *Post-Keynesian Principles of Economic Policy*. Edward Elgar, Cheltenham, pp. 78–98.

- Piilkington, P. (2014): *Endogenous Money and the Natural Rate of Interest: The Reemergence of Liquidity Preference and Animal Spirits in the Post-Keynesian Theory of Capital Markets*. The Levy Economics Institute of Bard College, Working Paper No. 817. <https://doi.org/10.2139/ssrn.2509361>
- Rodrik, D. (2015): *Economics rules: The rights and wrongs of the dismal science*. WW Norton & Company.
- Romer, D. (2000): *Keynesian macroeconomics without the LM curve*. Journal of Economic Perspective, 14(2): 149–169. <https://doi.org/10.1257/jep.14.2.149>
- Shiller, R.J. (2011): *Irving Fisher: Debt Deflation and Crises*. Cowles Foundation Discussion Paper No. 1817. <https://doi.org/10.2139/ssrn.1909810>
- Schumpeter, J. (1954): *History of Economic Analysis*. Allen Unwin, London.
- Schumpeter, J.A. (1980): *A gazdasági fejlődés elmélete. Vizsgálódás a vállalkozói profitról, a tőkéről, a hitelről, a kamatról és a konjunktúraciklusról (The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle)*. Közgazdasági és Jogi Könyvkiadó, Budapest.
- Szakolczai, Gy. (2016): *Keynes életútja és a Nemzetközi Valutaalaphoz vezető gondolatai (The life of Keynes and his role in establishing the International Monetary Fund)*. Közgazdasági Szemle (Economic Review), 63 (July–August): 838–857. <https://doi.org/10.18414/KSZ.2016.7-8.838>
- Szalai, Z. (2015): *Időpreferencia és Keynes kamatelmélete (Time preference and Keynes's theory of interest)*. Magyar Nemzeti Bank, Monetary Strategy Department, manuscript.
- Taylor, L. (2010): *Maynard's Revenge. The Collapse of Free Market Macroeconomics*. Harvard University Press, Cambridge, MA.
- Tily, G. (2007): *Keynes Betrayed: The General Theory, the Rate of Interest and 'Keynesian' Economics*. Palgrave Macmillan, London, New York. <https://doi.org/10.1057/9780230801370>
- Tymoigne, E. (2006): *Fisher's Theory of Interest Rates and the Notion of Real: A Critique*. The Levy Economics Institute of Bard College, Working Paper No. 483. <https://doi.org/10.2139/ssrn.948755>
- Tymoigne, E. (2017): *Money and banking Post 21: The Interest rate*. <http://neweconomicperspectives.org/money-banking>. Downloaded: 24 May 2018.
- Weeks, J. (1998): *A neoklasszikus közgazdaságtan kritikája (A Critique of Neoclassical Macroeconomics)*. Aula Kiadó, Budapest.
- Wray, L.R. (2004): *When are Interest Rates Exogenous?* SSRN. <http://dx.doi.org/10.2139/ssrn.1010158>.