

# **The role of “artificially” low interest rates through credit expansion**

## **The road to prosperity or another recession?**

My Hedlin (22159)

Current macroeconomic doctrine holds that the aim of monetary policy should be a steady inflation rate aligned with expectations. Consequently, central banks have declared remarkably low interest rates after the financial crisis in 2008 and pursue vast monetary expansion in their battle against slumbering economic activity. This thesis questions to what extent macroeconomists can claim to know the consequences following after the immediate stimulative effect on investment of such a policy measure. The subject-matter of investigation is the so-called *circulation credit theory*, which holds that credit expansion to producers will induce systematic misallocation of resources, creating an inherently unsustainable boom that will necessarily end in crisis. This theory, developed by Ludwig von Mises and Friedrich von Hayek, was discarded by mainstream economics as the Keynesian revolution changed the landscape of economic theory, after having been much debated in prestigious journals during the 1930's. It is here investigated whether the most influential economists criticizing the theory during the debate, John Maynard Keynes, Piero Sraffa and Frank Knight, who all considered themselves able to invalidate the theory, ever succeeded in doing so. A careful inquiry into their main arguments suggests that none of these succeeded in their alleged refutation and that the proposition of the harmful effects of credit expansion put forth by Hayek and Mises might have been too hastily discarded.

Keywords: Circulation credit theory, Credit expansion, Monetary policy, Interest rate, Austrian business cycle theory

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This thesis dives into a subject that was completely unfamiliar to the author at the start, employing a method almost extinct in the current era of econometrics and heavy model building. The endeavor has been highly rewarding in its constant demand in scrutinizing propositions both familiar and unfamiliar to the modern mainstream economist. I hope, furthermore, that the reward has not only been for my benefit, but will also serve as thought provoking for the reader, as it has been for me.

Fortunately, I have not been entirely alone on this journey. I would, above all, like to thank my dear brother for challenging me to venture beyond the textbooks and, not the least, for taking over the cooking when the deadline approached. Furthermore, the sound and honest criticism from my supervisor Hans Tson Söderström has been highly meritorious and even though not all thoughts induced by our discussions have found place in this text, they continue to benefit my continued contemplation on the subject. I also want to extend my greatest thanks to all those people who, without knowing me from before, have gladly met up for conversations and answered my e-mails when I found myself in need of consultation. And last, but not least, I am grateful for all support from family and friends, always by my side.

## THE PROBLEM AT HAND

The quite extraordinary character of today's interest rates dictated by central banks is likely noticed even by those untrained in the subject of economics. The arithmetical height is conspicuously low and some central banks have even taken the rare measure of announcing negative rates.<sup>1</sup> This decisive monetary action is part of the answer to a question having dominated macroeconomists for the last half-decade, namely, the question of how to get back on the road to prosperity after the painful detour forced upon the world by the financial crash in 2008. The credit expansion enabled by the low interest rates, a typical textbook policy measure, is thought to stimulate economic activity and make the economy recover to its potential. It is only in the short run, however, that economic theory asserts a stimulative effect. In the long run, economists hold that the amount of money does not affect the level of prosperity, summarized in the famous dictum of "money as a veil." This must mean, however, that there is some kind of transition from the effect in the short run to the non-effect in the long run. This, in turn, actuates the question of the nature of this transition and how well explored this is by economic theory.

It is an indubitable fact that macroeconomics contains many riddles yet unsolved. Furthermore, the fact that most economists had not foreseen the severe downturn in the economy in 2008 may suggest that the unsolved riddles of macroeconomics constitute more than just the details. Given the current situation, a greater understanding of the effects of "artificially" low interest rates through credit expansion<sup>2</sup> ought to be regarded as an urgent task for macroeconomics. What is not generally known, however, is that one of the greatest debates in economics treated this very question. During the 1930's, the circulation credit theory<sup>3</sup> engaged several prominent economists and prestigious journals in debate on this matter. The theory asserts that when an increase in the money supply is channeled to the economy through investment loans, a boom will be promoted, but the essential point is that the boom will *not* be sustainable and a crisis will follow as its inevitable consequence. The theory was brought to English speaking economists when elaborated upon by Friedrich von Hayek in 1931, after having been first enunciated by Ludwig von Mises in German literature in 1912. However, the theory dropped off the map of mainstream economics a long time ago, around the time when Keynesian teachings changed the theoretical landscape, and the modern expounders reside, as of today, on the periphery of the economics profession. The question relevant for today is whether this theory was abandoned due to criticism successfully refuting it, or because of shifted interest of the profession to other doctrines. Robert Skidelsky (1996), biographer of Keynes once wrote: "Hayek was defeated by Keynes in the economic debate of the 1930s, not, I think, because Keynes 'proved' his points, but because, once the economy had collapsed, no one was very interested in the question

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<sup>1</sup> To give two examples, as of 05/14/2015, the deposit rate at the European Central Bank is *negative* 0.20% (The European Central Bank, 2015) and the repo rate of the Swedish Riksbank is *negative* 0.25% (The Riksbank, 2015).

<sup>2</sup> In this work, the word "artificially" refers to the lowering of the interest rate using credit expansion, *i.e.* supplying the economy with a greater quantity of money channeled through the loans market.

<sup>3</sup> The theory has many names: the circulation credit theory, the Hayekian business cycle theory, the Misesian business cycle theory, the Austrian business cycle theory, the Wicksell-Mises theory of the business cycle, the Hayek-Mises business cycle theory, and so on. The circulation credit theory was the term that Mises used when referring to it. Most common today, however, is the term "Austrian business cycle theory." This is not used in this text for several reasons. Firstly, Mises and Hayek are not the only "Austrians" to have presented a theory of the business cycle. Second, the term "Austrian" in itself, in the sense of denoting a certain branch of economics, is ambiguous and has too many ideological connotations to be helpful. Lastly, Mises repeatedly pointed out that he considered the label "Austrian" strange considering the non-Austrian roots of the theory: "Why call this monetary or credit expansion theory of the trade cycle the 'Austrian' or the 'Austro-Wicksellian' theory? Of course, I am very grateful for the honour paid in this way to me and to my country. But why forget that this theory is a continuation, perfection and generalisation of the Currency theory? Neither Wicksell nor I myself nor Professor Hayek have ever forgotten to emphasise this point" (Mises, 1943, p. 252).

of exactly what had caused it.” Indeed, theories have been discarded before, only to be found valuable again later in history.<sup>4</sup> Perhaps the circulation credit theory is such a theory. If so, this greatly influences what we can expect as the consequences of expansionary monetary policy. There is, therefore, good reason to look into the circulation credit theory, whose adherents do not judge its validity to ever having been properly refuted, in order to assess its value once more.

## PURPOSE AND AIM

The economics profession at large acts as if the critique raised against the circulation credit theory has successfully refuted its validity by neglecting the theory and promoting credit expansion as the remedy of recession.<sup>5</sup> On the other hand, the theory’s contemporary adherents act as if no successful critique has ever attacked it by continuing to promulgate its ideas.<sup>6</sup> The debate that should be provoked by this tension is, however, largely absent.

The purpose of this investigation is to revitalize this question anew and attempt to bring the debate to the main stage of economic discussion. This will be done by re-examining the essential points of argument raised by the theory’s most influential opponents in its heyday, just before it was discarded by the greater part of the profession. The aim is to investigate, by careful examination, to what extent and in what respects these arguments were successful in their avowed rebuttal of the theory’s validity. Providing an answer, if only a tentative answer, to this question will be the contribution of this work. The discussion is, however, not designed to be necessarily definite, but rather to provide a platform for renewed debate. If it can be shown that the theory was indeed successfully refuted, its contemporary adherents will have to defend their theoretical stance, or, if found impossible, to revise their position. If, on the contrary, it can be shown that the critique never achieved in refuting the circulation credit theory this raises great doubts about the soundness of expansionary monetary policy in general, a soundness largely taken for granted by a considerable part of the economics profession. Furthermore, regardless of outcome, the circulation credit theory may serve as inspirational material for modern economics in the variety of analytical tools employed not part of the current textbooks.

## RESEARCH QUESTION

This leads to the research question, formulated as follows: *Does a careful scrutiny of the critique published by the circulation credit theory’s most influential opponents verify this critique as being successful in its alleged refutation or not?*

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<sup>4</sup> A prominent example is the quantity theory of money, now part of every introductory macroeconomic textbook, which was discredited in the old debate between the Currency and the Banking schools (as reported by Ohlin in the foreword of Wicksell’s *Interest and Prices* ([1898] 1962)) before it was rehabilitated by Irving Fischer, only to be partly challenged by Keynesianism and then emphasized anew by the monetarists and Milton Friedman.

<sup>5</sup> Note the formulation “act as if.” Most economists today have not taken an active stand regarding the circulation credit theory it. Many decades have passed since the theory was part of mainstream discussion and most have inherited the neglect of it from the prior generation.

<sup>6</sup> These contemporary adherents primarily publish in the journals *The Austrian Economic Review* and *The Quarterly Journal of Austrian Economics*, and many belong to and teach through the Mises Institute.

## THE RELEVANCE OF CREDIT EXPANSION

Currently, there is, in fact, a growing strand of empirical literature showing that financial crises are preceded by credit booms (see for example Mendoza & Terrones, 2008; Schularik & Taylor, 2012 and Borio, 2012). Specifically, prior to the two worst economic episodes during the last century, the crash in 1929 and the ensuing Great Depression and the Great Recession actuated by the crash in 2008, extensive credit expansion was conducted by the monetary authorities. Following the depression of 1921—also preceded by remarkable growth in the monetary supply (Ebeling, 2009, p. 207)—the Federal Reserve System decided to pursue price level stabilization (p. 208), promoted by, among others, the great economist Irving Fischer. Consequently, despite an impressive growth in production, the price level (even wholesale prices) were remarkably stable all through the golden twenties, thanks to the monetary expansions conducted by the Fed Milton Friedman and Anna Schwartz, in their famous *Monetary History of the United States, 1867–1960*, estimated that the money supply increased about 45%,<sup>7</sup> or approximately 4.6% a year, between 1921 and 1929 (Friedman & Schwartz, 1963, p. 274). Using a broader measurement of the money supply, adding savings and loan shares and the cash value of life-insurance policies, Rothbard ([1963] 2000, p. 84) showed that the money supply had increased with an average annual increase of 7.7% between 1921 and 1929. Similarly, the money supply<sup>8</sup> in the US rose by 63% during the years 2001 to 2007 (World Bank, 2015).<sup>9</sup> This emerging empirical pattern of financial crises being preceded by credit expansions suggest that looking into the mechanisms set into play by such expansions might be a worthwhile endeavor. Let us now turn to how to go about this investigation.

## METHOD

The appraisal of the virtues of economic theories today is chiefly based on empirical scrutiny, that is, economists generally assess a theory by “taking it to the data.” Quite tellingly, within the economic profession we often call an economic theory a hypothesis, not a theory, until it has been successfully subjected to the test of empirics; only then are its virtues verified and the hypothesis promoted within the hierarchy of science to the level of theory. There is good reason for this, as will soon be discussed. And it would seem natural to subject the circulation credit theory to the same test. But this would be a neglect of the difference in epistemological foundation upon which it rests.

### *Different kinds of criticism: truth and usefulness*

Economists are not much for examining the epistemological foundation of their theories. Leave such questions to the philosophers, and economic reasoning to economists, many would say. Yet this advice will not be followed here. The reason is the *a priori* character of the circulation credit theory setting certain standards on when one can say to have *refuted* the theory or not, which is, indeed, the question we set out to answer.

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<sup>7</sup> Using a definition of money that included currency in circulation and demand and time deposits, a definition known as M-2 (Friedman & Schwartz, 1963, p. 273).

<sup>8</sup> Defined as the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government, known as M-2 (The World Bank, 2015).

<sup>9</sup> With the following increase each year: 2001 7.5%; 2002 4.4%; 2003 4.5%; 2004 5.7%; 2005 8.2%; 2006 9.0%; 2007 11.7% (World Bank, 2015).

Every theory is based on logical reasoning. This logical reasoning must always be applied to some “starting-points,” which may be called premises, axioms, postulates, assumptions, or something of that sort. Every theory that is deduced correctly is *true* in the sense that it *must hold whenever its premises apply* (even if it is only in a hypothetical world) because such are the rules of logic. A theory is therefore only *false*, in the strictest use of the term, if it contains logical inconsistencies in its deduction. Trivially, there are two kinds of premises: those that apply in our world, and those that do not. Much economic theorizing today consists of stipulating assumptions that are known not to be true. Assumptions of the form “Suppose people are fully rational,” “Suppose country A produces output Y according to the Cobb-Douglas production function” and “Suppose we have two goods, cannons and butter” are not made with the delusion that this holds true, but because they are deemed to (potentially) render insights and predictions that are illuminating and useful. When we subject economic theories to empirics, therefore, we do not test the validity of the implications of the theory—these can only be investigated by close scrutiny of the logical deductions—but we test whether “that world” as described by its premises is close enough to “our world” to be of any practical use. This is ultimately a test of *usefulness*. But notably, some of the theories held in the highest esteem within the economics profession are *significantly different* from the ones just described. Their validity is accepted *not* based on empirical tests of its implications, but on an acknowledgement of sound logical reasoning and premises that trivially apply to our world. This is the category of *a priori* theories, with the two prominent examples of the Theory of Supply and Demand and the Law of Comparative Advantage. The Theory of Supply and Demand can be deduced from the three basic premises that goods are scarce, that they have alternative uses and that people have scales of relative valuation, which Lionel Robbins shows in his famous *Essays on the Nature and Significance of Economic Principles* (1932). We do not need to subject it to empirical tests since economists accept the premises as axiomatic and trivially true. The Law of Comparative Advantage is, similarly, deduced from the trivial premise that people are not all identical in skill, and thus, it is accepted without any need for empirical verification.

The credit circulation theory is not as “straight-forward” and parsimonious, but it also belongs to this category of *a priori* theories. It is based on a set of premises meant to be an accurate representation of our world as we know it, and based on these premises, it follows, *as a logical consequence*, that a boom induced by an expansion of credit to producers cannot be sustainable. Hayek states this rather forcefully in saying that: “[e]ven if we had never noticed cyclical fluctuations, even if all the actual fluctuations of history were accepted as the consequences of natural events, consequential analysis of the effects which follow from the peculiar workings of our existing credit organization [*i.e.* the ability by banks to arbitrarily change the supply of money] would be bound to demonstrate that fluctuations caused by monetary factors are unavoidable” (Hayek, 1933, pp. 184-185). The kind of critique that has a legitimate methodological foundation of being able to actually *refute* the circulation credit theory follows naturally from this discussion. Critique that successfully shows inconsistencies in the logical reasoning proves the theory false and, therefore, refutes it. Critique that successfully shows the premises to be untenable, or that important premises are omitted which influence the result when included, makes the theory’s *a priori* character crumble and will here be considered a refutation. But critique only mustering to claim that the implications of the theory do not seem to agree with empirical facts, without pointing to any fault either with the premises or the deduction, will *not* be considered a *refutation* of the theory, only an *indication* of this possibility, or of the possibility that the theory holds true but leaves unexplained residue.<sup>10</sup> Consequently, in order to be able to conclusively refute the circulation

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<sup>10</sup> Even if one does not adhere to the virtues of epistemological reasoning on the territory of economic science, it will have to be realized that the circulation credit theory does not lend itself easily to empirical testing. There are no quantifiable predictions, no straightforward relationship between

credit theory, it must be torn apart by its own weapon: logic. The method employed when examining the critique will thus be to review the points of objection published by the opponents to the theory and to challenge these with two questions: (1) whether it succeeds in identifying a premise or a line of reasoning which underpins the circulation credit theory in such a way that it must hold for the theory itself to hold and (2) if so, whether the opponent successfully demonstrates the invalidity of this premise or line of reasoning. If critique urged against the theory succeeds in *both* these regards, it will be considered to have refuted the circulation credit theory. If it fails in any of the two, it will not be granted this success.

### *A note on a limitation*

It goes without saying that, in what follows, it will be my own interpretation of the essentials of the circulation credit theory as well as the critique that will be set forth, and, as such, I am acting entirely on my own responsibility. Given that the arguments of the 1930's controversies have been described as difficult to interpret,<sup>11</sup> I regard my contribution as an impetus for further investigation rather than one that will settle the matter. It is the objective to present all arguments carefully and impartially and to aim for transparency in my presentation so that any misconception or fallacious reasoning, if present, should be detectable by the reader. Should that be the case, I hope for the discussion to continue and that we act on the strength of science as a collaborative endeavor. Then the aim of this work will still have succeeded with its ultimate purpose: to initiate debate on a question deemed to be of great importance to macroeconomics.

### LIMITS OF SCOPE

Many works have been written on the circulation credit theory (apart from the works of Mises and Hayek, examples include Rothbard, 1962 and Garrison, 2001) and it would be out of scope to consider them all here. However, the kernel and center of the theory has remained unchanged since it was introduced in 1912.<sup>12</sup> This investigation will primarily deal with the versions of the theory expounded by its most famous authors, namely, Friedrich von Hayek, in his London lectures *Prices and Production* ([1931] 1967) and the supplementary article *Monetary Theory and the Trade Cycle* (1933), and Ludwig von Mises in his *magnum opus Human Action* ([1949] 1989). Similarly, it is out of the scope of this thesis, and possibly not even a fruitful task to undertake, to consider *all* critique that has been published on the circulation credit theory. A selection must be made. This investigation will be delimited to those critics deemed to having had the greatest influence on the general opinion of economists during the time that the theory was published, namely John Maynard Keynes (1931), Piero Sraffa (1932a; 1932b) and Frank Knight (1931; 1935; 1941).

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aggregates and in an overall growing—or, more precisely, non-stationary—economy there are no predictions on any absolute movements. Instead, the predictions concern the distortion of the relation between millions and millions of prices.

<sup>11</sup> Commenting on the academic battle on the issue of capital theory fought between, among others, Knight and Hayek, Kaldor stated that “[t]he literature created by this discussion is already sufficient to fill volumes, and most of it makes very difficult and often tedious reading. Yet a perusal of the more recent publications does not suggest that much progress has been made towards mutual understanding” (1937, pp. 202-203). Knight expressed similar concern regarding the debate between Hayek and Sraffa, as will be seen below.

<sup>12</sup> Works by its modern adherents have chiefly been preoccupied with modifying parts of the theory so as to fit specific circumstances, mainly the contemporary money and credit organization which no longer relies on gold, or with translating the theory into a language more familiar to contemporary economists, but, importantly, they have never changed the fundamental insights.

Lastly it must be said that although the *impetus* for the current examination is to provide guidance for policy, the scope of the thesis is limited to *theory*, not policy. I find this particularly important to emphasize since one of the hindrances, I believe, to impartial inquiry into the circulation credit theory is some concern regarding it to have drastic policy implications. But a theory never *has* policy implications. Not a single policy implication ever necessarily follows from, or is advocated by, a theory itself. The only claim a theory can have is to help us in the pursuit of making more informed choices, not to make them for us. Mises stressed this fact in saying that the intention of economics “is merely to show the nature of the problem at issue. The choice among all the possible solutions in any individual case depends upon the evaluation of pros and cons; decision between them is the function, not of economics, but of politics” ([1934] 1989, p. 25).

## BACKGROUND ON THE CIRCULATION CREDIT THEORY

In 1931, Hayek remarked that it had been accepted almost dogmatically by monetary economists that the aim of monetary policy ought to be to secure a stable price level (Hayek, [1931] 1967, pp. 28-29), which was indeed pursued and largely achieved during the 1920's. Today the stable general price level has been substituted for a steady increase in the price level, aligned with expectations. The circulation credit theory challenges the soundness of both these doctrines.<sup>13</sup> The vast credit expansion during the golden twenties, which kept the general price level largely stable despite the enormous increase in production, was, according to Mises and Hayek, the reason for the crash in 1929.<sup>14</sup> Irrespective of whether credit expansion induces inflation or not, they argued, it will always have an effect on relative prices. *And, ultimately, relative prices, not the general price level, is what guides production and the actions of economic agents.*

In 1931 Hayek was invited by Lionel Robbins (fluent in German, and therefore familiar with Hayek's works) to hold four lectures at the London School of Economics and act as a counterpoising balance to Keynes in the debate, by then starting to become an increasingly authoritative voice in English economics. The book *Prices and Production* was a publication of these four lectures and, as such, the theory in the publication was sketchy and highly condensed. In the first lecture, Hayek himself pointed this out by saying: “we stand as yet at the very beginning of this kind of investigation. And, though I hope that what I say in the next lectures may help a little, I am fully conscious that all results we obtain at this stage should only be regarded as tentative. *So far as I am concerned, it is the method of approach more than the details of the results which is of importance in what follows*” (Hayek, [1931] 1967, p. 31, emphasis added). But those who did not read German did not get the most favorable introduction to the circulation credit theory. The first version to be published in English, Hayek's *Prices and Production* ([1931] 1967), was largely a continuation of the arguments set forth by Mises in *Theorie des Geldes und der Umlaufsmittel* (“Theory of Money and Credit”) in 1912 and Hayek's own two previous articles *Geldtheorie und Konjunkturtheorie* (“Monetary Theory and the Trade Cycle”) and *Gibt es einen Widersinn des Sparens?* (“The Paradox of Saving”), which in 1931 were still inaccessible to those not mastering the German language. Due to the divergent doctrines on the Continent and in England at this time combined with the

<sup>13</sup> Indeed, Hayek stated further in 1931 that “I am of the opinion that, in the near future, monetary theory will not only reject the explanation in terms of a direct relation between money and the price level, but will even throw overboard the concept of a general price level and substitute for it investigations into the causes of the changes of relative prices and their effects on production. Such a theory of money, which will be no longer a theory of the value of money in general, but a theory of the influence of money on the different ratios of exchange between goods of all kinds, seems to me the probable fourth stage in the development of monetary theory” (Hayek, [1931] 1967, p. 31).

<sup>14</sup> They hold, however, that the theory does not explain the *depth or the duration* of the crisis, because that was due to historically contingent other factors (more on this later).



rather unfavorable circumstances for the English-speakers in their introduction to the circulation credit theory, John Hicks later commented that “*Prices and Production* was in English, but it was not English economics. It needed further translation before it could be properly assessed” (Hicks, 1967, p. 204).<sup>15</sup> It is, indeed, the question whether it ever got properly translated and assessed, before it got washed away by the Keynesian revolution.<sup>16</sup>

In short, the circulation credit theory argues that if a boom is induced by credit expansion—that is, by creating “new money” which enters the economic system through the channel of loans to producers (more on this later)—what looks like a prosperous boom is a period when *malinvestment* occurs due to producers planning their investment projects on a signal from the interest rate of there being more resources available in the economy than there actually are. The boom is therefore, below the surface, not as prosperous as it looks, and it will eventually have to end in crisis during which the economy painfully readjusts to its fundamentals. Phrased differently, the adjustment is the process of liquidating those investment projects which do not align with the economy’s available resources and consumer preferences, some of which will be abandoned all together, others that will be shifted into other uses; according to Mises and Hayek, a credit-induced boom requires a bust.

A great difference between the circulation credit theory and current macroeconomic doctrine is the level of aggregation. Mainstream macroeconomics theorizes in terms of high aggregates (aggregate demand, aggregate supply, total spending, total investment, capital K), an approach which, *by construction*, implicitly states that shifts *within* these variables are not of theoretical interest. Contrary to this, Mises and Hayek believed these high aggregates to be concealing too many important mechanisms in an economy. Furthermore, they argued that since aggregate variables *as such* never influence the choices of individuals, and since the choices of individuals is the subject matter of economics, economic theory can never resort to *causal* links between aggregates.<sup>17</sup> The circulation credit theory’s way of reasoning will therefore,

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<sup>15</sup> This difficulty has arisen again and again, with some of the most prominent economists of modern times confessing to not being able to understand Hayek’s arguments. Nobel laureate Robert Solow revealed in an interview with Jack Birner (1990, n. 28) that he found Hayek’s arguments to be “completely incomprehensible.” And Milton Friedman has stated himself to be a great admirer of Hayek, but not of his “technical economics.” While referring to *The Road to Serfdom* as “one of the great books of our time,” he stated that “*Prices and Production* is a very flawed book. I think his capital theory book [*The Pure Theory*] is unreadable” (Ebenstein, 2001, p. 81).

<sup>16</sup> It is difficult for a modern student of economics to understand the shift that occurred in economic after the publication of Keynes *General Theory of Interest, Money and Employment*, but, as famously remarked by Paul Samuelson, it certainly lived up to the epithet “revolution.” He later recalled: “It is quite impossible for modern students to realize the full effect of what has been advisably called ‘The Keynesian Revolution’ upon those of us brought up in the [pre-Keynesian] orthodox tradition. To have been born as an economist before 1936 was a boon – yes. But not to have been born too long before! [...] *The General Theory* caught most economists under the age of 35 with the unexpected virulence of a disease first attacking and decimating an isolated tribe of South Seas islanders. Economists beyond fifty turned out to be quite immune to the ailment. With time, most economists in-between began to run the fever, often without knowing or admitting the condition [...] This impression was confirmed by the rapidity with which English economists, other than those at Cambridge, took up the new Gospel [...] at Oxford; and still more surprisingly, the young blades at the London School [of Economics] threw off their Hayekian garments and joined in the swim [...]. Finally, and perhaps most important from the long-run standpoint, the Keynesian analysis has begun to filter down into the elementary textbooks; and, as everybody knows, once an idea gets into these, however bad it may be, it becomes practically immortal” (Samuelson, 1947, pp. 146–147).

<sup>17</sup> Mises stated this clearly with the following phrase: “If there is any sense in such notions as volume of trade and velocity of circulation, then they refer to the resultant of the individuals’ actions. *It is not permissible to resort to these notions in order to explain the actions of the individuals*” (Mises, [1949] 1998, p. 397, emphasis added). Hayek similarly agreed: “[It is] a positive hindrance to further progress [...] if we try to establish *direct* causal connections between the *total* quantity of money, the *general level* of all prices and, perhaps, also the *total* amount of production. For none of these magnitudes *as such* ever exerts an influence on the decisions of individuals; yet it is on the assumption of a knowledge of the

in fact, be more familiar to a current microeconomist than a current macroeconomist, since it is deduced in a “step-by-step” manner with a strict adherence to methodological individualism, following a causal process of individual market actions and reactions, plan adjustments and readjustments. As a consequence, the theory comes out seamless between the short term and the long term, and between microeconomics and macroeconomics. In the parlance of modern economics, Mises developed a microeconomic foundation for macroeconomics, without resorting to “representative agents” acting according to mathematical formulae. Furthermore, capital, Mises and Hayek emphasized, is concrete and heterogeneous, not abstract and homogeneous, and it has an important time structure. Time is an inherent, endogenous, variable in production, not an “add-on” to a production model. When models use the capital aggregate  $K$ , important mechanisms are hidden by the model.

## PRESENTATION OF THE CIRCULATION CREDIT THEORY

Now, let me present the circulation credit theory. The exposition here is necessarily a succinct sketch relative to the written works by Mises and Hayek but I hope it to nonetheless serve as a satisfactory basis for the reader in providing the ability to judge the merits of both the theory itself and the critique raised against it in what follows.<sup>18</sup>

### *The capital structure*

Mises and Hayek relied heavily on the capital theory of their predecessor Eugen von Böhm-Bawerk for their theory of the unsustainable boom. Especially Hayek made the *structure of production*, a concept introduced by Böhm-Bawerk, the central piece of his theory.

Böhm-Bawerk states that all human production has the *ultimate aim* of creating goods for consumption (Böhm-Bawerk, [1891] 1930, p. 78). But this can be done in two ways. Either we put forth our labor in such a way that the desired consumption good immediately emerges as a result, or we may intentionally “take a roundabout way,” that is, first dedicate our labor to creating a capital good, or intermediate good, that is not itself intended for consumption, but that assists in the making of the consumption good that we aim for (p. 82). Böhm-Bawerk uses a couple of illustrations to convey his point: either one can gather shellfish on the shore for immediate consumption, or productive powers can first be used for building a boat and a net and after their completion take to fishing more efficiently (p. 82); either firewood can be gathered by breaking off branches from trees, or productive powers can first be dedicated to creating a stone axe that makes the gathering of firewood more efficacious. And this may be made even more “roundabout” by beginning by constructing machines for each of the separate stages, and so on (pp. 84-85). Böhm-Bawerk continues by remarking “that roundabout methods lead to greater results than direct methods is one of the most important and fundamental propositions in the whole theory of production. [...] Economic theory does not and cannot show *a priori* that it must be so; but the unanimous experience of all the technique of production says that it is so” (p. 20). In many cases, “roundabout” methods in fact are the *only* way to get a consumer good. If I need glasses, for instance, the only way

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decisions of individuals that the main propositions of non-monetary economic theory are based. It is to this ‘individualistic’ method that we owe whatever understanding of economic phenomena we possess; that the modern ‘subjective’ theory has advanced beyond the classical school in its consistent use is probably its main advantage over their teaching. *If, therefore, monetary theory still attempts to establish causal relations between aggregates or general averages, this means that monetary theory lags behind the development of economics in general*” (Hayek, [1931] 1967, pp. 3-4, last emphasis added).

<sup>18</sup> Furthermore, arguments both of present day and previously are often based on easily corrected misapprehensions of the theory and it is hoped that some of these will be automatically tackled as the theory is now set forth.

of producing them is to employ capital; there is no “immediate way.” This is not to state, of course, that every roundabout way must be more productive than a less roundabout way. This would be utter nonsense. But usually there exists *some* more roundabout way that has superior productivity, and it is the role of the entrepreneurs to figure these out. Capital is the “symptom” of the existence of these more productive roundabout production processes. Capital would not exist if all consumer goods we wanted could be produced most efficiently in the “immediate” manner. Then capital would have no *raison d’être*.

Böhm-Bawerk’s crucial point is that roundabout production, that is, production that uses capital goods, can only be obtained with an *initial sacrifice* (Böhm-Bawerk, [1891] 1930, p. 82). The fisher who wishes to build a boat *will first have to sacrifice hours she could otherwise have spent on gathering shellfish on the shore* and therefore, temporarily, her consumption will have to be curtailed compared to if she had just continued gathering shellfish. This sacrifice is what we call saving: “[t]he essential thing is that the current endowment of productive powers should not be entirely claimed for the immediate consumption of the current period, but that a portion of this endowment should be retained for the service of a future period. But such a retention will undoubtedly be called a real saving of productive powers” (pp. 102-103). This was to become an important stepping-stone for both Mises and Hayek.

Equally important, Böhm-Bawerk noted that a characteristic mark of the modern economy is that only a small proportion of what is consumed is the result of productive powers dedicated in the same year. Instead, much of what is consumed is the fruit of efforts from earlier period. Gottfried Haberler has given the following illustrative example: “[t]ake, e.g., a pair of shoes and trace its economic family tree. Our path leads us from the retailer via the wholesale merchant to the shoe factory; and, taking up one of the different threads which come together at this point, say, a sewing machine used for the fabrication of shoes, we are led to the machine industry, the steel plant, and eventually to the coal and iron mine. If we follow another strand, it leads us to the farm which bred the cattle from which the leather was taken. Every good has to pass through many successive stages of preparation before the finishing touches are applied and it eventually reaches the final consumer. [...] Now, in the equipment of these successive stages of production, the capital stock of a country, which has been accumulated during centuries, is embodied” (Haberler, 1932, pp. 50-51). Equivalently, in the current year, most productive powers are directed at making intermediate products which will render no consumption goods in the same year, but which aim at consumption in future years (Böhm-Bawerk, [1891] 1930, p. 91). To illustrate this, Böhm-Bawerk employed nested circles, see figure 1, where the outer circle represents those goods which will be transformed into consumption in the coming year, the second outmost circle those goods that will be transformed into consumption within two years, and so on (p. 108). He also stated that in an economy, some processes will be more roundabout, some less so. Many will complete the whole process, from preliminary work to the finished good, in a year or two. Many others will need three, four, five years. Some, but probably comparatively few, will need ten, twenty, thirty years (pp. 108-109). In the outmost circle in the figure we both find those goods which have short, “less roundabout,” production processes that only take one year, as well as those goods which belong to “more roundabout” processes but which were initiated several years ago and thus now find themselves close to consumption (pp. 108-109). For this reason, this outer circle will always embrace the greatest amount of goods in a stationary economy.

Then the question arises: what determines the capital structure of an economy? In a market economy, the decisions of investors will be directed by prices and the chance of profit, which ultimately depends on consumer wants through their demand for present goods relative to future goods (Böhm-Bawerk, [1891] 1930, p. 114). Every lengthening of the production process, will, as we have seen, generally prove more effective—which would be the reason for investors to embark on it—but *it will need saving, a retrenchment of current consumption* relative to if the lengthening had not taken place. The ability to devote time and resources to the production of capital goods, is therefore always limited to the amount of savings available. If it were the case that the amount of savings was overestimated, for some reason, projects would be embarked upon which do not have the “backing” to be able to reach fruition, and it will be revealed sooner or later that the supplies that were meant to support daily consumption while waiting for the fruits of the investment were not enough. To briefly borrow an illustration from Ludwig Lachmann (1963) to convey the point, a prudent agricultural society would never release half its labor force for the construction of a bridge before they believe themselves to have worked up a sufficient stock of grain to sustain themselves during their engineering endeavor. When people save, for example by the purchase of valuable paper, in bank deposits, in loan securities, etcetera, they show themselves willing to forgo part of what they could have consumed today and thus this becomes part of “productive credit” (Böhm-Bawerk, [1891] 1930, pp. 115-116). Thus the capital structure is never set in stone; it is constantly maintained and adjusted through the decisions of all the investors in the economy. Just as there needs to prevail a balance between the production of different consumption goods in the economy according to consumer demand, so there also needs to prevail a certain proportion between the production for the present and for the future.

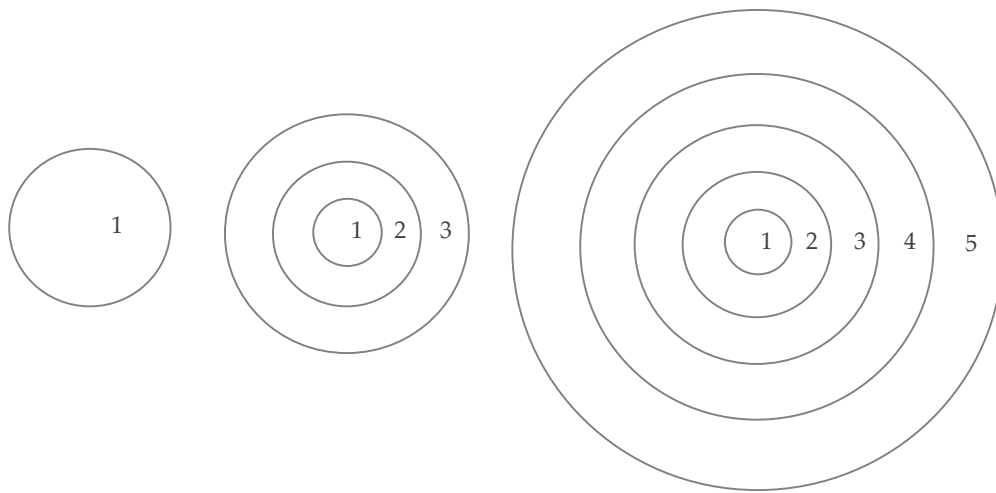


Figure 1. Böhm-Bawerk's illustration of economies with different capital structure (figure adapted from [1891] 1930, p. 107). Economies with increasingly lengthened capital structures are illustrated from left to right. To the left, an economy with either no capital goods, or very few, is depicted, the sole circle indicating that everything produced in a given year has the aim of consumption in the same year. To the right an economy is shown with production in a given year dedicated for consumption in everything between the same year and in five years' time. Needless to say, current modern economies would have far more circles than any of the three economies shown here.

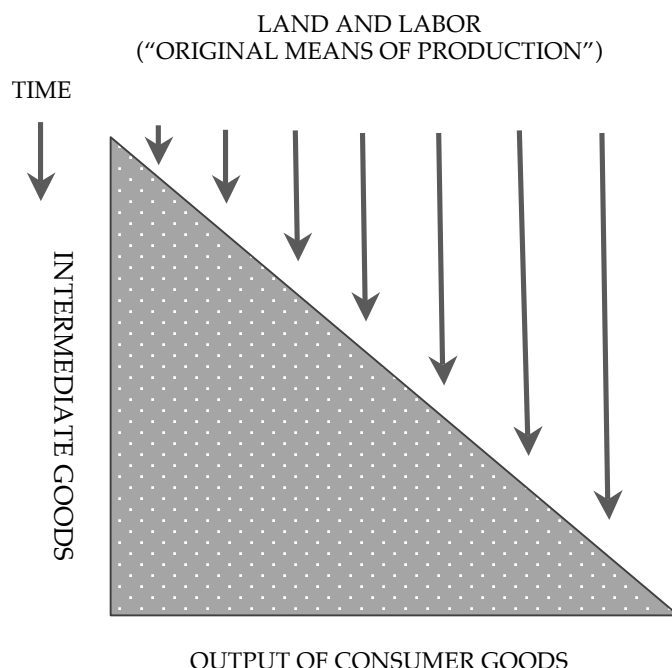


Figure 2. Hayek's stylized picture of the capital structure. At the bottom flows an output of consumer goods. In order to produce these, the original means of production, land and labor, are employed in a continuous fashion in production processes of different length. Some of the labor is employed to directly produce consumer goods (shown to the right), while the lion's share of the labor is dedicated to producing intermediate goods which are not themselves meant for consumption but that aid in the production process. In a completely stationary society, the slope of the hypotenuse will exactly correspond to the rate of interest (Hayek, 1933, p. 113). Figure adapted from Hayek's *Prices and Production* ([1931] 1967, p. 39).

Hayek famously introduced the notion of the capital structure to Great Britain with a right triangle, see figure 2, which he made extensive use of in his *Prices and Production* (Hayek, [1931] 1967, p. 39). This capital structure stands in stark contrast with the concept of capital as most trained economists today think of it, as an aggregate called K. And we will soon see the central role that the notion of a capital structure plays in the circulation credit theory.

### *The equilibrium rate of interest*

Another economist who provided an important concept was the Swedish economist Knut Wicksell.<sup>19</sup> This was the "normal" rate of interest—which Hayek called the "natural" or "equilibrium" rate of interest, causing great confusion which will later be given attention in the analysis<sup>20</sup>—referring to the interest rate that *balances the*

<sup>19</sup> Hayek deemed Wicksell's concept so central to the theory that he refers to it as the Wicksell-Mises theory in his introduction to *Monetary Theory and the Trade Cycle* (Hayek, 1933, p. 47). It is furthermore interesting to note that Wicksell was also a great inspiration for Keynes.

<sup>20</sup> There is great ambiguity regarding this term since Wicksell employed two similar but yet different conceptualizations to define the "normal" and the "natural" interest rate. As we will see later, Hayek's referral to the "natural" rate of interest (defined by Wicksell as the interest that would prevail in a barter economy), when he actually meant Wicksell's term the "normal" rate of interest (defined by Wicksell as the interest rate that balances the supply of savings and the demand for loan capital), precipitated some of the subsequent critique. To add further to the confusion, Wicksell later called the "natural" rate the "real" rate of interest, which is not to be confused with Irving Fischer's term "real" interest, which is the dominant meaning of that term today. Hayek uses "natural" and "equilibrium" rate of interest rather interchangeably in his *Monetary Theory and the Trade Cycle* (1933).

*demand for loan capital and the supply of savings in the economy.* Wicksell had developed this concept so as to explain movement in the general price level. He argued that in a money economy, the market rate of interest may differ from the equilibrium rate since the demand for and the supply of capital do not meet in their “natural form,” but in the form of money, the quantity of which may be arbitrarily changed by the banking sector (Hayek, [1931] 1967, p. 23). Further, Wicksell argued that, as long as the market rate of interest coincides with the equilibrium rate, it remains “neutral” in its effect on the general price level and that, therefore, as long as the two rates are in agreement, the price level will remain stable. If however the market rate of interest is held below the equilibrium rate of interest, the price level will rise indefinitely. But both Mises and Hayek pointed out that this does not generally hold true; it will only do so in a stationary economy, which is neither growing nor retrograding. As Hayek points out, “the amount of money in circulation must change as the volume of production increases or decreases. The banks could *either* keep the demand for real capital within the limits set by the supply of savings, *or* keep the price level steady; but they cannot perform both functions at once” (p. 27). Therefore, “[t]he rate of interest at which, in an expanding economy, the amount of new money entering circulation is just sufficient to keep the price-level stable, *is always lower than the rate which would keep the amount of available loan-capital equal to the amount simultaneously saved by the public*” (Hayek, 1933, p. 114, emphasis added).

Mises would agree with this explanation, but had a different way of putting it. He argued that the interest rate in a stationary society will ultimately depend on people’s time preference between current goods and future goods—that is, he did not subscribe to the theory of interest rate as the marginal efficiency of capital, but adhered to the time-preference theory of interest, (Mises, [1949] 1998, pp. 523-524). He christened this the “originary rate of interest.” This is not the time nor the place to examine different theories of interest, so let us think about the “originary rate of interest” as a way of describing that, all else equal, people prefer present goods over future goods. In the non-stationary, real world, every contract interest rate is a combination of the originary interest rate, *i.e.* people’s preference for current goods (and thus also current money) over future goods, *plus* an entrepreneurial component, since “the moneylender is always an entrepreneur. Every grant of credit is a speculative entrepreneurial venture, the success or failure of which is uncertain” (p. 536).

### *Forces of deviation from the equilibrium rate of interest*

There are two different, often complementary reasons for why the current monetary organization will tend to induce a market rate of interest residing below the equilibrium rate, or the originary rate plus an entrepreneurial component. There is a common feature, however, namely the ability by the banking sector of *credit expansion*. Credit expansion, as defined by Mises and later employed by Hayek, is the granting of loans *using money that did not exist in the economy before the loans were granted*. In principle, this money can be extended as producer credit, consumer credit or government credit. In reality, all three occurs to some extent and different episodes in history have seen more or less of one or the other. The circulation credit theory, however, focuses mainly on the effect of credit expansion to *producers* and this particular scenario is the sole focus of the current text.

Credit can take two, fundamentally different, forms, from the point of view of society. Mises termed these different forms “circulation credit” and “commodity credit,” hence the name of the circulation credit theory. These particular names have become somewhat obsolete with the abandoning of the gold standard, but the principle still applies. The latter is a mere *transfer* of credit, intermediated by the banks, which means that for each amount of money extended as credit, someone has

saved a corresponding amount (abstracting from banking fees and profit margins). The former, in contrast, is credit that can be extended by the banks by creating additional money supply and, therefore, this credit has not been preceded by an equivalent amount of saving.<sup>21</sup> If prices are to rise (which is the aim of an inflation target) in an economy with evermore-increasing amount of goods and with stable velocity of money, the amount of money has to increase. Thus, if the central banks are to keep their inflation targets, they will have to continuously increase the money supply. *If this additional amount of money supply is channeled to the economy through the banking system in the form of granting loans to producers, it means that it takes the form of a credit expansion to producers.* As we have seen, this must mean that the supply of savings and the demand for credit are not in correspondence. The supply of savings *will be less* than the credit extended.

Additionally, the insight in Hayek's *Monetary Theory and the Trade Cycle* was that it is not only the central bank, with its monopoly on the supply of money, which makes the money supply "elastic." Under the organization of fractional banking, the *banking system* could, additionally, produce a highly elastic money supply *even if* this was not open as a possibility to any *individual* bank. The reason is the following. Say a bank is under the obligation to keep a reserve of 10 percent. If a certain amount of cash is newly deposited with this bank, it will be in the position, due to its particular reserve rules, to grant new credits amounting to maximum 90 percent of the newly deposited sum. Let us assume it does this. After this sum has been granted as credit the bank has exhausted its individual lending capacity. But for the banking system as a whole, this is not necessarily true. If the granted sum is now deposited at another bank, this new deposit will appear as "original" for the second bank as for the first bank. Thus the second bank (assuming it also keeps a reserve of 10 percent) will similarly be in a position to relend 90 percent, and the same process can, in principle, continue until the original deposit has given rise to credits corresponding to  $0.9 + 0.9^2 + 0.9^3 + 0.9^4 \dots$  times the original amount. As the sum of this converging infinite series is 9, "the banks will be enabled, in an extreme case, to create, against an amount of cash flowing in from an outside source, credits equal to nine times that amount" (Hayek, 1933, pp. 156-159). The crucial insight here is that for any individual bank, it is impossible to distinguish between deposits that have arisen through cash payment and those that find their origin in credit (p. 163). Therefore, a

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<sup>21</sup> At the time when the circulation credit theory was expounded in 1912, the media of exchange was gold. If the banks would only conduct their lending business by granting credit in gold, what Mises called "commodity credit," they could never grant a larger amount of money than its customers have entrusted to it. In such a scenario the banks would, in terms of lending, serve as nothing more than facilitators of transfer between suppliers of savings and lenders of credit. In such a scenario, the money interest rate will, on average, tend to correspond to the equilibrium interest rate, since supply and demand for savings will tend to equilibrate. However, Mises noted that in his time, a practice of fiduciary media had been adopted, which meant that banks could lend more money to investors than savers had entrusted them. It is a matter of practical indifference, he argued, whether this is done by "physical" lending, in the form of banknotes, of money or by *opening of accounts* at the banks, pp. 303-304). This granting of credit out of the issue of fiduciary media, not fully baked by initial savings, is what Mises termed *circulation credit* (Mises, [1949] 1998 p. 430). This fiduciary media—the banknote or the balance on users' checking accounts—was a claim that provided its holder the right to "real" money, gold, payable upon demand by the issuing bank. An issuer of claims on any economic good other than money would not dare issue more claims than she could fulfill, for all goods, with the exception of money, are ultimately destined for consumption, and will therefore eventually be claimed (Mises, [1934] 1953, p. 299). Money, however, has the peculiar feature that money-claims can completely substitute for money, because as long as money-claims are accepted as payments, there is no reason to go and demand the actual money (Mises, [1934] 1953, p. 300). Therefore, the granting of credit through the issuance of fiduciary media will—except during turbulent times—remain in circulation and fulfill the exact same task of commodity money, a fact that made it possible for commercial banks to develop a fractional reserve banking system. Furthermore, circulation credit will affect the market phenomena in the same way as money. A change in their quantity influence the purchasing power of money just as a change in the quantity of money would (Mises, [1949] 1998 pp. 430-431). With the disappearance of commodity money and the replacement of fiat money, the conspicuous difference between money and circulation credit became even more blurred. But the clear definition of *credit expansion* remains, namely the granting of loans with money that did not exist before the loans were granted.

scenario in which the market interest rate resides below the equilibrium rate need not, by any means, have been brought about by a deliberate lowering of the interest rate (p. 147). What is more, just as a pyramid has been built on the original deposit, if deposits unexpectedly diminish at any part of the banking system, the whole process will *have to be reversed* (p. 161), and as such, the money supply will be highly elastic under a fractional banking system. Hayek concludes that here we have a reason for why, under the existing organization of the economic system, we always find a deviation of the market rate of interest from the equilibrium rate (p. 139).

### *The boom*

Equipped with these analytical tools: the theory of capital, the notion of the equilibrium interest rate—or the originary interest rate plus the entrepreneurial component—and the definition of credit expansion, we are now ready to see why a credit expansion will induce a boom that must eventually end in bust. The version of Hayek is first explained, then follows the exposition of Mises.

### *The Hayek story*

Hayek introduced a graphical framework to support the circulation credit theory for his London lectures, which is the one that will be described now. In the most general terms, a change of length of an economy's production processes will, Hayek states, come about *if the total demand for production goods increases relative to consumer goods*. This, in turn, can come about in two ways: either as a result of a change in voluntary saving or as a result of a change in the quantity of money that alters the relative funds of disposal between entrepreneurs and consumers (Hayek, [1931] 1967, pp. 49-50). The second scenario is the outcome of credit expansion, the subject matter of investigation. Hayek argues that before we can ever ask how something can go wrong, we must first show how it can go right (Garrison, 2001), he begins with a change in voluntary saving, in order to then be able to juxtapose the sustainability and unsustainability of the two different scenarios.

Thus we start in the situation illustrated by figure 3, where Hayek has simplified the production from the continuous process depicted in figure 2 to a process of discrete stages. The numbers on each stage represent the market value of the goods,<sup>22</sup> as they are to pass on to the next stage, and, ultimately, to be consumed.<sup>23</sup> In a stationary state, the diagram *simultaneously depicts the total amount of intermediate products that must exist at any moment in time, and where in the capital structure they must reside, in order to secure a continuous flow of consumer goods* (Hayek, [1931] 1967, pp. 39-40). In a market economy, the satisfaction of consumer preferences are always the end target of production and in a stationary market economy, the capital structure is the result of the preferences of consumers not only in terms of *kinds* of products, but also as the result of their historical willingness not to consume every unit of output, but to save and invest further in production.

<sup>22</sup> It is important not to confuse market value with neither the subjective value of the consumers nor the quantity of goods, as prices may (and will, in this illustration) change independently of these both. Hayek actually says that these figures represent *value* (see Hayek, [1931] 1967, p. 42), but since it is evident that this cannot be subjective value, I have taken the liberty to make this term more precise by calling it market value.

<sup>23</sup> It should be noted that, since the figure represents values and not physical production, the surplus return obtained by the roundabout methods of production is not represented and that interest is intentionally neglected. It is furthermore assumed that the intermediate products remain the property of the owners of the original means of production until they have turned into consumers' goods and are sold to consumers. Interest is then received by the owners of the original means of production together with wages and rent (Hayek, [1931] 1967, pp. 42-43).



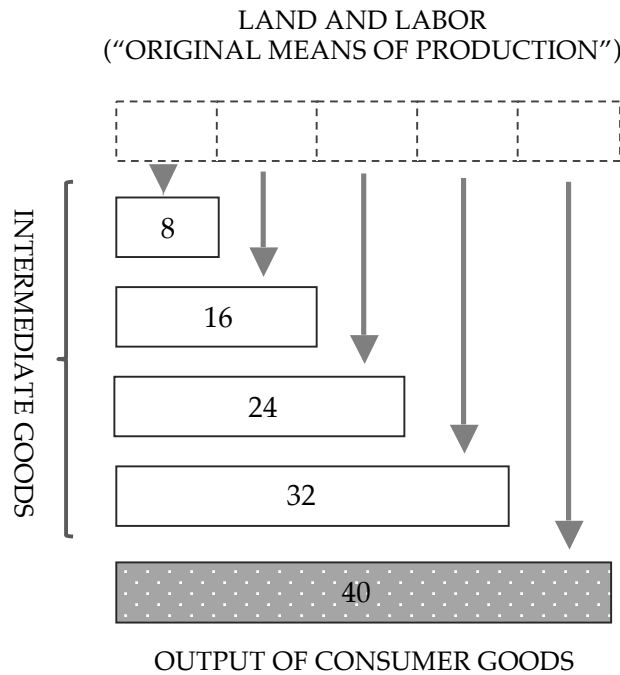


Figure 3. The stationary economy with a capital structure in line with consumer preferences and the economy's resources *before* the decision to increase saving. Some land and labor are dedicated to the direct production of consumption goods (the right-most arrow), but most of it is used to continuously upholding and making use of the capital structure. Figure adapted from Hayek's *Prices and Production* ([1934] 1967, p. 44).

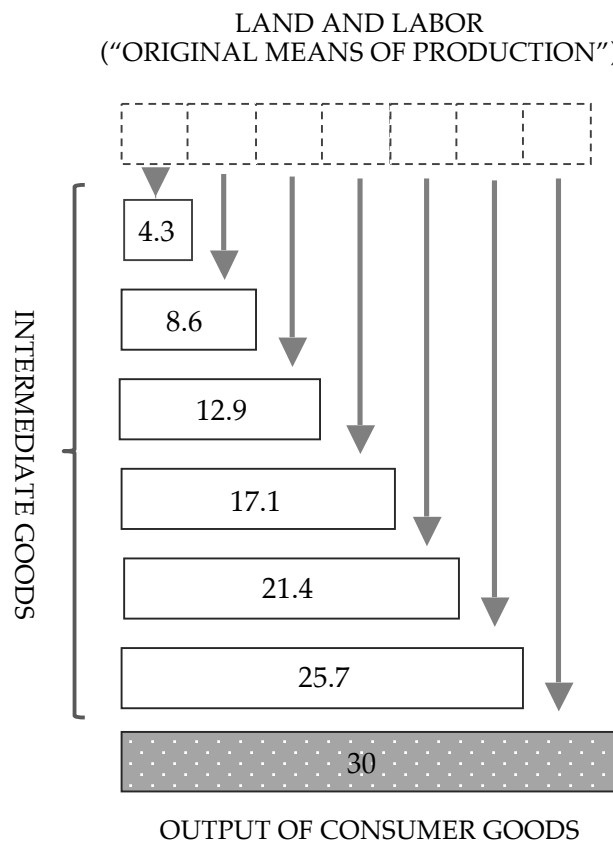


Figure 4. The capital structure of the stationary economy *after* the change in time preference, *i.e.*, after the decision to save more. The capital structure has been lengthened and the money value of total output has decreased, while the physical amount of consumer goods has increased, making the economy richer. Figure adapted from Hayek's *Prices and Production* ([1934] 1967, p. 52).

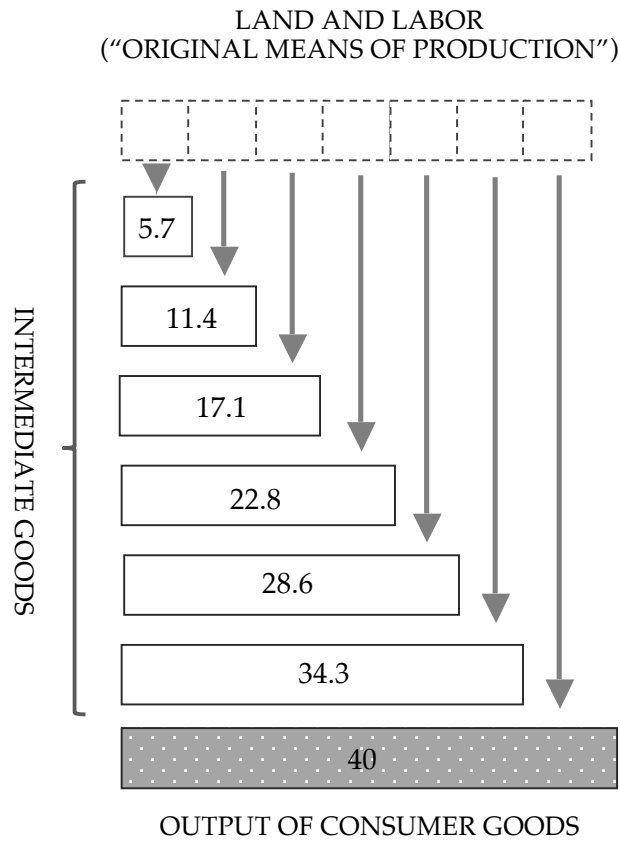


Figure 5. With credit expansion, the purchasing power of producers is increased relative to that of consumers. The interest rate acts as if more resources are available than there really are and the capital structure is lengthened. Figure adapted from Hayek's *Prices and Production* ([1934] 1967, p. 56).

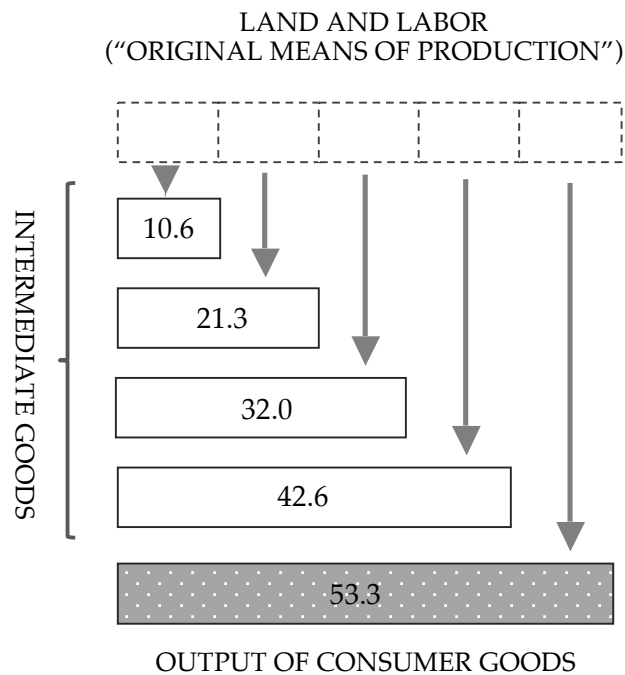


Figure 6. The capital structure of the equilibrium state that corresponds to the actual fundamentals in the economy in figure 5, *i.e.* the state that the economy tries to reestablish during the crisis. Corresponds exactly to figure 3, only with higher prices. Figure adapted from Hayek's *Prices and Production* ([1934] 1967, p. 59).

The crucial point is that capital will remain in this particular structure only if entrepreneurs find it profitable to re-invest the usual proportion of their return of the respective stages in producing intermediate goods of the same sort (Hayek, [1931] 1967, p. 48). Whether this is deemed profitable is, in turn, dependent upon the discrepancy in prices that the entrepreneurs anticipates will be received for the product from this particular stage of production on the one hand and for the intermediate stage, as well as the prices for the original means of production, on the other. Thus, “every given allocation of goods as between different branches and stages of production, requires a certain definite relationship between the prices of the finished products and those of the means of production. *In a state of equilibrium, the difference necessarily existing between these two sets of prices must correspond to the rate of interest*, and at this rate, just as much must be saved from current consumption and made available for investment as is necessary for the maintenance of that structure of production” (Hayek, 1933, pp. 112-113).

Now, Hayek says, starting in picture 3, suppose capital is continuously maintained but that, above and beyond this, nothing is saved. Then suppose consumers start saving and investing a quarter of their earnings, and that this ratio is from now on continuously upheld. Suppose furthermore that the amount of and velocity of money stays the same (Hayek, [1931] 1967, pp. 50-51). The initial proportion of the demand for consumer goods to the demand for intermediate products, 1:2—which we get from  $40:(8+16+24+32) = 40:80$ —will no longer be upheld, *since it no longer aligns with consumer preferences*. Instead, a new capital structure will emerge, one that corresponds to the new preferences—that is, to the new proportions 30:90, or 1:3. The additional amount of money available for purchase of intermediate goods must then be applied such that the amount of consumer goods is sold for the lower amount of thirty, which is from now on available for this purpose. Now, *if this is to be the case, the only way that the new savings can be employed for production is by lengthening the production process*. When the transition is complete, brought about by the process of trial and error of profit-seeking entrepreneurs responding to the changes in prices, the structure will have changed from the situation in figure 3 to that of figure 4. At first glance, it looks as though the economy has been impoverished, since now the market value of consumer goods is only thirty, compared to the earlier forty. This is, however, due to the fact that as the amount of money in the economy is unchanged, there must be a fall in the unit price of consumer goods, initially due to the lower amount of money available for their purchase stemming from the consumer decision to save more, and later on, additionally, due to the increased output of consumer goods. The end result is an economy with an elongated production process producing *more* than before, and with a lower price per consumption good unit. The amount of money spent on the stages of production close to consumer goods has decreased and the amount on the earlier stages has increased, together with the creation of stages that did not exist before (p. 53).

But how is this change in capital structure *actuated*? When consumers decide to save more they use a lesser proportion of their income for consumption and the immediate effect is a rise in demand for production goods relative to consumer goods, and therefore a relative increase in the prices of the production goods. But the essential point is that the prices of producer goods will not rise uniformly, nor will all of them rise, because other forces are simultaneously at work. The production stage closest to consumption will be more affected by the decrease in consumer goods' prices than they will be by the enhanced demand production goods. Thus the prices of goods at this production stage will fall, but less than the fall in prices of consumer goods. This in turn, induces a lowering of the price margin between these two stages. This must, in turn, have the consequence that employment of funds in this production stage is suddenly less attractive than their employment in earlier stages, and part of them will be shifted accordingly (Hayek, [1931] 1967, pp. 75-76). The change in relative prices of production goods between the different production

stages will also *affect the profit prospects* of the respective production stages, and the non-specific goods will be attracted to the earlier stages, where relatively higher prices are now offered. *This shift will go on until all those services and goods that can be readily employed in new stages have more or less equalized the profits.* At the same time, additional stages of production have emerged that will need new goods of the specific kind. Some will be in the form of new kinds of products, others will be natural resources which previously were not deemed profitable to employ (p. 78).<sup>24</sup>

Now we contrast this scenario of an increase in voluntary saving with a credit expansion. Hayek consciously chooses to illustrate a credit expansion that initially brings about the same change in ratio as the scenario above. Therefore, let us now assume a credit expansion of the size of 40 monetary units. As is the definition of expansion of credit, the money that is lent to the producer did not exist before the loans were granted, i.e. it was not precipitated by any additional saving in the economy. To secure borrowers for a credit expansion, the banks must hold the interest rate “artificially” below its natural rate exactly to the extent as to make profitable the employment of exactly this amount—no more, no less (Hayek, [1931] 1967, pp. 85-86). Assuming that we start in equilibrium and that, therefore, there are no idle resources available—an assumption whose relaxation will be discussed below—the borrowers of the new circulation credit can only start investments by outbidding their peers for resources. One may ask how it can be that the entrepreneurs who saw profitability only with this new lower interest rate can outbid those who saw profitability with a higher rate. The answer is that the lowering of the interest rate will change the relative profitability of the different factors of production also for their *current* employments, which will give a relative advantage to those investments which are relatively capital-intensive (p. 86). The earlier investment projects will therefore find it more profitable to release part of their employment of the original means of production—labor and land—a tendency further induced by the rise in prices of these means of production.

Hayek argues that the change in the structure of production that is *necessary* in order to find use for the additional means at the disposal of the producers will *exactly correspond* to the change brought about by saving, that is, the elongation of the production process tantamount to the scenario above. Each stage of production will have the same output measured in physical units as in the case represented by figure 4, but with the apparent difference that the money-value of all goods is larger, due to the higher amount of money in circulation, as seen in figure 5 (Hayek, [1931] 1967, p. 55). *The most important difference is, however, not seen in the figures, but will become evident with the elapse of time.* In the first scenario, when the change in the capital structure was precipitated by a change in voluntary saving, the new capital structure *matched the new consumer preferences* (p. 55). Furthermore, *the resources that were freed in the act of reducing current consumption could be used for furthering the investment in production* (p. 57). In the scenario of credit expansion, consumption may go on largely unaffected initially, because those goods that have already reached the later stages of production will continue to flow toward consumers for some time. But it is clear that this cannot go on. Eventually a scarcity of consumer goods will make itself felt. When this happens, their prices will go up. Had it been the case that the elongation of production processes had been preceded by saving, inventories of consumers good would have been filled up since goods would initially flow at an unchanged rate. But in this scenario, this is not the case. Eventually, the economy

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<sup>24</sup> It should perhaps be made clear that all these movements in prices and quantities are strictly *tendencies* of such changes, as is always the interpretation of static equilibrium theory. As Hayek makes clear, “[w]hether and to what extent such changes in demand will lead to an actual change in price will of course depend on the elasticity of supply, which in the particular case depends in turn in every stage on the degree of specificity of the intermediate products and the factors from which they are made” (Hayek, [1931] 1967, p. 80).

will have to end up in figure 6, and the transition from figure 5 to figure 6 will take the form of a crisis.

### *The Mises story*

With Hayek's graphical framework at the back of our heads, we now instead turn to Mises' explanation of the boom, which, although relying on the same mechanisms as Hayek's, differed significantly in method of exposition. Mises instead starts with the statement that since a credit expansion is equivalent to an increase in the supply of loans, it must influence the market rate of interest (Mises, [1949] 1998, p. 535). However, *it does not influence the originary interest rate* because the only thing that influences the originary rate of interest is a change in time-preference of the agents of the economy (which is not directly causally linked with credit expansion).<sup>25</sup> In the case of credit expansion, the market rates of interest will now *systematically deviate from the height that would have prevailed without it* (pp. 544-545). This, in turn, means that the market interest rate can no longer serve its function of guiding the entrepreneurs in maintaining a capital structure consistent with consumer preferences.

At the eve before credit expansion, the market rates of interest corresponded to the originary interest rate plus the entrepreneurial component agreed upon in each case of lending activity. Everyone wanting and able to borrow at this rate, could borrow as much as they wanted. *Without any other change in data, additional loans can therefore only be placed at a lower market interest rate.* This could manifest itself either in an arithmetical drop in the interest rate stipulated on loan contracts or credit extended to agents that until now did not qualify for lending at this rate due to the height of their entrepreneurial component (Mises, [1949] 1998, p. 549). Since the entrepreneur uses the interest rate, together with the prices on wages, prices of production and the anticipated prices of future products, a lowering of the interest rate must, *ceteris paribus*, mean that the projects residing on the margin which until now were not deemed profitable, now are. As John Maynard Keynes himself once argued: "[n]o one believes that it will pay to electrify the railway system of Great Britain on the basis of borrowing at 5 percent. . . . At 3 1/2 percent it is impossible to dispute that it will be worthwhile. So it must be with endless other technical projects" (quoted in Haberler, 1932, with the source *Unemployment as a World Problem* (Chicago, 1931), p. 39). The businessman's calculation is now affected by the change in the market interest rate due to the credit expansion. Entrepreneurs borrow credit and business activity is stimulated. As such, a boom begins (Mises, [1949] 1998, p. 550).

When entrepreneurs expand production, prices on factors of production must increase since the amount of capital and labor available for investment has not changed. Neither is consumption restricted (Mises, [1949] 1998, p. 553). On the contrary, the immediate effect of a credit expansion in consumption will be a rise in consumption on behalf of those wage earners whose incomes have risen due to the entrepreneurs' increased competition for their services (p. 554). On the whole, the situation is as follows. Production has been altered and expanded in such a way that the length of waiting time for final consumer goods has been extended. *But the demand for consumer goods has not altered in a corresponding way, and therefore the available supply of consumer goods will not last for the period it will take for the "new"*

<sup>25</sup> Although it may do so indirectly, since a credit expansion will change the data of the economy, and a change of the data of the economy may, to a larger or lesser extent, influence the difference in appraisal of present goods versus future goods. Mises writes: "The phenomenon to be dealt with is this: The rate of originary interest is determined by the discount of future goods as against present goods. It is essentially independent of the supply of money and money-substitutes, notwithstanding the fact that changes in the supply of money and money-substitutes can indirectly affect its height. But the gross market rate of interest can be affected by changes in the money relation. A readjustment must take place" (Mises, [1949] 1998, p. 548).

*consumer goods to reach completion* (p. 553). Apart from the rise in price of consumer goods due to the increased demand from higher-than-before income earners, the prices will rise additionally due to the relative scarcity of consumer goods that must be the consequence of the lengthening of production time (p. 553), a phenomenon commonly known as “forced saving” (p. 554). With the rise in price of consumer goods, the tendency for business to expand is made even stronger, and their intensified activities bring about an even further increase in the price of factors of production, and thus again an increase in the price of consumer goods. As long as the banks are willing to progressively expand credit, the business boom will continue. But the expansion of production is not induced by additional capital made available by saving, but by withdrawing factors of production from other lines of business. This is the characteristic mark of the credit-induced boom (p. 554). An algebraic exposition may elucidate the phenomenon further:

Let us call  $r$  that amount of capital goods which, out of the gross proceeds of production over a definite period of time must be reinvested for the replacement of those parts of  $p$  used up in the process of production. If  $r$  is employed for such replacement, one will be in a position to turn out  $g$  again in the following period of time; if  $r$  is withheld from this employment,  $p$  will be reduced by  $r$ , and  $p - r$  will turn out in the following period only  $g - a$ . We may further assume that the economic system affected by a credit expansion is a progressing system. It produced “normally,” as it were, in the period of time preceding the credit expansion a surplus of capital goods  $p1 + p2$ . If no credit expansion had intervened,  $p1$  would have been employed for the production of an additional quantity of  $g1$  of the kind of goods produced previously, and  $p2$  for the production of the supply of  $g2$  of a kind of goods not produced before. The total amount of capital goods which are at the entrepreneurs’ disposal and with regard to which they are free to make plans is  $r + p1 + p2$ . However, deluded by the cheap money, they act as if  $r + p1 + p2 + p3 + p4$  were available and as if they were in a position to produce not only  $g + g1 + g2$ , but beyond this also  $g3 + g4$ . They outbid one another in competing for a share of the supply of capital goods which is insufficient for the realization of their overambitious plans (Mises, [1949] 1998, p. 556).

Now the banks will be faced with an increasing demand for loans from the business community as the rising prices of consumer goods spread optimism of future profits. The entrepreneurs are willing to borrow money at increasing market rates and despite higher charges by the banks, the entrepreneurs go on borrowing. Arithmetically—that is, in nominal terms—the market rate will be higher now than on the eve of the credit expansion. Nonetheless, the market rates will lag behind the height that *would be needed to cover the ordinary interest rate, the entrepreneurial component and the price premium* (Mises, [1949] 1998, p. 555).

Additional investment in production is only possible to the extent that there actually exists an additional supply of capital goods available to invest. However, in contrast to the so-called “forced saving,” a credit-induced boom is characterized not by decreased consumption—which would free productive powers that could be used in production—but rather an increase also in consumption (Mises, [1949] 1998, p. 556). The credit-induced boom does *not bring about overinvestment, but malinvestment, that is, investment in the wrong lines given the present-future preferences of consumers*, who, ultimately, decide the profitability and non-profitability of the business community’s investments. Since, in order to expand production of goods, it is necessary to first invest in expanding the production of those goods which are farthest removed from the finished consumer goods (p. 557)—because in order to expand production of shoes, clothes, motorcars, furniture, houses, the first step is to invest in expanding the production of iron, steel, copper—increased investment will be dominant in the kind of production which is rather “far away” from consumer goods. In short, the entrepreneurs embark upon production projects with the available supply of  $r + p1 + p2$  as if they had the available supply  $r + p1 + p2 + p3 + p4$ , which means that they embark upon investment projects for which the available capital supply will not

suffice. Sooner or later, this reality will make itself felt. Eventually, “there are plants which cannot be utilized because the plants needed for the production of the complementary factors of production are lacking; plants the products of which cannot be sold because the consumers are more intent upon purchasing other goods which, however, are not produced in sufficient quantities; plants the construction of which cannot be continued and finished because it has become obvious that they will not pay” (p. 556).<sup>26</sup> A crisis will arise.

The boom will come to an end when the afflux of additional credit expansion ceases since this will start restoring the actual preferences of the consumers. For this reason, the turning point will be coincidental with increasing market interest rates, and so, *prima facie*, it might look like the cause is the decision by the banks to restrict lending activities. But this is just the manifestation of the underlying cause. And now everything will quickly turn for the worse: “[t]he entrepreneurs must restrict their activities because they lack the funds for their continuation on the exaggerated scale. Prices drop suddenly because these distressed firms try to obtain cash by throwing inventories on the market dirt-cheap. Factories are closed, the continuation of construction projects in progress is halted, workers are discharged. As on the one hand many firms badly need money in order to avoid bankruptcy, and on the other hand no firm any longer enjoys confidence, the entrepreneurial component in the gross market rate of interest jumps to an excessive height” (Mises, [1949] 1998, p. 560). This will be the result of the credit-induced boom.

### *The nature of the crisis*

Both Mises and Hayek leave the exact *nature* of the crisis to the economic historians, because, in their view, the particular way that a crisis unfolds and the depth and duration of it, will always be contingent on the historical context. The only thing they do assert is that *there will be one*, of one form or the other, since investment projects will have to be abandoned, workers laid off, capital left idle—or, to the extent possible, adapted to other uses—and prices and wages lowered and adjusted to the fundamentals of the economy.

It should be noted that the circulation credit theory is fully compatible with the empirical observation famously made by Anna Schwartz and Milton Friedman that the Great Depression was actuated by a contraction in the money supply. Furthermore, the “animal spirits” described by Keynes in his *General Theory of Employment, Interest and Money* (1936) as the cause of fluctuations may very well be one of the tangible symptoms of the ending of Mises’ and Hayek’s unsustainable boom. Mises echoed this in stating that while the boom produces impoverishment due to wasteful investment that later have to be liquidated, “still more disastrous are its moral ravages. It makes people despondent and dispirited. The more optimistic they were under the illusory prosperity of the boom, the greater is their despair and their feeling of frustration” (Mises, [1949] 1998, p. 574). This psychological downturn may very well have the result of delaying the process of readjustment, due to the fact that people are slow to realize the new situation, that businessmen continue unprofitable projects, and that people “have for the moment lost self-confidence and the spirit of enterprise to such an extent that they even fail to take advantage of good opportunities” (p. 576). But the great difference between the observations made by Schwartz, Friedman and Keynes is that the circulation credit theory does not hold these as the primary causal phenomena, but merely as manifestations of the problems already present.

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<sup>26</sup> This, of course, does not concern *all* investments that were embarked upon as a result of the credit expansion. Many will, due to an array of reasons such as business acumen, fortunate changing circumstances, flexibility, luck, and so on, succeed, be profitable, and make society more prosperous. But this cannot apply on the aggregate.

### *A note on technological development*

The fact that the theory abstracts from technological development is not to be interpreted that its authors did not think of technological advancement as an important part of economic life. The point is merely that the circulation credit theory works both with and without the simultaneous existence of technological development. In fact, Hayek pointed out that technological improvement and the corresponding business optimism may very well be the *impetus* for credit expansion. The reason is that as investment demand increases due to “technology optimism,” the equilibrium rate of interest will tend to go up. But under the existing monetary organization, it is likely that the banks will not raise the interest rate correspondingly, since, for any single bank not acting in concert with the rest, this will mean the losing of customers. What starts out as a “healthy” investment enthusiasm may therefore, with time, become piggybacked by a credit-boom (see Hayek, 1933, pp. 167-173).

### *Idle resources*

The starting point for the circulation credit theory is a state of equilibrium with no unused resources being available for new entrepreneurs. In a world where there are always unused resources, this may seem impermissible even as a starting assumption. But Hayek turned the question on its head. Unused resources always exist but since they are not explained by static equilibrium theory, we are not entitled to take them for granted. They are, on the contrary, a phenomenon which itself needs explanation (Hayek, [1931] 1967, pp. 34-35). By starting in the assumption of a state of equilibrium, and thus, to start where general static equilibrium theory leaves off, the circulation credit theory is instead *able to explain* a scenario of idle resources, both capital and labor, since this will be the tangible manifestation of the readjustment phase of the bust. Thus, “[h]ere then we have at last reached an explanation of how it comes about at certain times that some of the existing resources cannot be used, and how, in such circumstances, it is impossible to sell them at all—or, in the case of durable goods, only to sell them at very great loss” (p. 96). The facilities made unusable by the bust will look as though society is wasting resources. But to regard it in this manner does not make more sense than if one insisted that society is wasting resources by not employing obsolete technology. The existence of unused capital, which deceptively looks like excess capital caused by insufficient consumption, is a symptom that the economy is not *able* to use those fixed plants for some reason, and if they were caused by the business cycle, the reason is that the current demand for consumer goods is too urgent to allow for investment in those long production processes, which the unused plants could assist. This unused capacity is thus the result of entrepreneurial errors committed in the past (p. 96).

But, after having explained a boom-bust cycle starting in equilibrium, both authors relax this assumption and discuss the case of existing idle resources. Not the least, Hayek deemed this relaxation to be of great importance since “the existence of unused resources has very often been considered the only fact which at all justifies an expansion of bank credit” (Hayek, [1931] 1967, p. 97). Mises echoes this with his colorful words: “[i]n the opinion of the public, more inflation and more credit expansion are the only remedy against the evils which inflation and credit expansion have brought about. Here, they say, are plants and farms whose capacity to produce is either not used at all or not to their full extent. Here are piles of unsalable commodities and hosts of unemployed workers. But here are also masses of people who would be lucky if they only could satisfy their wants more amply. All that is lacking is credit. Additional credit would enable the entrepreneurs to resume or to expand production. The unemployed would find jobs again and could buy the



products. This reasoning seems plausible. Nonetheless it is utterly wrong" (Mises, [1949] 1998, pp. 574-575).

Hayek and Mises took somewhat different stance on the possible virtues of a credit expansion. Hayek was open but highly skeptical of the practicability:

In theory it is at least possible that, during the acute stage of the crisis when the capitalistic structure of production tends to shrink more than will ultimately prove necessary, an expansion of producers' credits might have a wholesome effect. But this could only be the case if the quantity were *so regulated as exactly to compensate* for the initial, excessive rise of the relative prices of consumers' goods, and if arrangements could be made to withdraw the additional credits as these prices fall and the proportion between the supply of consumers' goods and the supply of intermediate products adapts itself to the proportion between the demand for these goods. And even these credits would do more harm than good if they made roundabout processes seem profitable which, even after the acute crisis had subsided, could not be kept up without the help of additional credits. Frankly, I do not see how the banks can ever be in a position to keep credit within these limits. [...] even if the absorption of the unemployed resources were to be quickened in this way, it would only mean that the seed would already be sown for new disturbances and new crises. The only way permanently to "mobilise" all available resources is, therefore, not to use artificial stimulants—whether during a crisis or thereafter—but to leave it to time to effect a permanent cure by the slow process of adapting the structure of production to the means available for capital purposes (Hayek, [1931] 1967, pp. 96-99).

Mises, on the other hand, argued against the belief that an increase in the money supply would be the right remedy for the situation at all. He contended that if commodities and workers cannot find employment, this is because their prices and wages asked are too high. "He who wants to sell his inventories or his capacity to work must reduce his demand until he finds a buyer. Such is the law of the market" (Mises, [1949] 1998, p. 575). He noted that to a great extent, the unwillingness to adjust wages and prices is a speculative action. The agents of the market are hoping that if they wait, they will be able to get a higher price at a later date. The unemployed who does not want to change occupation is hoping that the market will turn more favorable to his position again, which is, of course, fully legitimate (p. 576). But the advocates of credit expansion see the scarcity not in the fundamental capacity of society, and its misalignment with consumer preferences, but maintain that the scarcity is in money and credit, and if only credit it expanded again, "[t]hen the plants will work at full capacity, the inventories will be sold at prices their owners consider satisfactory, and the unemployed will get jobs at wages they consider satisfactory" (p. 577). Mises explanation for why this popular view does not make sense when scrutinized is that it implies that "the rise in prices, brought about by the additional fiduciary media would at the same time and to the same extent affect all other commodities and services, while the owners of the excessive inventories and the unemployed workers would content themselves with those nominal prices and wages they are asking—in vain, of course—today. [...] The course of the boom is not substantially affected by the fact that at its eve there are unused capacity, unsold surplus inventories, and unemployed workers" (p. 577).

We have now reached the point of testing the validity of our newly acquired analytical tools in analyzing the effect of credit expansion. After going through an overview of the critique raised, the arguments promulgated by the critics will be carefully examined.

## A BRIEF OVERVIEW OF THE CRITIQUE

Due to language and communication barriers there were largely two independent bodies of economic theorizing in Europe during the 1920's and 1930's, the Anglo-Saxon and the Continental, the latter predominantly influenced by Austrian and Swedish economists (Stein, 1985, p. 27). While the Continental debate was roughly up to date with the latest in the Anglo-Saxon debate, the opposite was not equally true.<sup>27</sup> In 1912 Mises published *Theorie des Geldes und der Umlaufsmittel* ("Theory of Money and Credit"), which, in its last pages, contained the first, although not fully elaborated, version of the circulation credit theory. This work, however, was not translated to English until 1934, in a version adopting English terms veiling one of the very main points Mises tried to make.<sup>28</sup> Between the years 1919 and 1946 Mises continued this argument in various essays in German, but these were not translated to English until 1978. The first full Misesian version in English of the theory was therefore written as part of Mises' treatise *Human Action*, published 1949. This was a book covering nearly nine hundred pages, of which the circulation credit theory demanded approximately fifty. It is no surprise then that this theory has chiefly been referred to as the Hayekian theory of the business cycle in the English literature. In 1931, Lionel Robbins invited Hayek to London School of Economics in order to give a series of lectures. As has been mentioned, Hayek had by then already started the argument for a monetary theory of the trade cycle, building on the insights of Mises and adding his own reasoning, in two articles that had been published in German (and that were not, as of yet, translated). The lectures were published as the book *Prices and Production*, which, since it was the literal reproduction of his manuscript, set strict boundaries of scope and thus made the exposition very brief (Hayek, [1931] 1967, p. vii). In Hayek's own words, this invitation came at a time when he had "arrived at a clear view of the outlines of a theory of industrial fluctuations but before I had elaborated it in full detail or even realised all the difficulties which such an elaboration presented" (p. vii).

And so the "drama" began. What followed the publication of *Prices and Production* was an intense activity in high-ranking journals debating Hayek's proposition, hitherto unfamiliar to the English-speaking economists; that a credit-induced boom had to end in a crisis and impoverish society. The participants of the debate ranked high, the most notable among them being John Maynard Keynes, Piero Sraffa, Frank Knight, Friedrich von Hayek, Nicholas Kaldor, Sir John Hicks, Gunnar Myrdal and Lionel Robbins.<sup>29</sup> Hayek published extensively during this decade, emphatically defending and explaining his position. However, except for a reply to an issue raised by Ludwig Lachmann in 1943, Mises did not publish any articles as part of the

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<sup>27</sup> Lionel Robbins lamented this in 1933: "I know of no natural science in which it would be possible for a man to devote years to the discovery of propositions which are already commonplaces in language areas other than his own. It is notorious that in Economics this frequently happens" (Robbins, foreword in *Monetary Theory and the Trade Cycle*, p. 7).

<sup>28</sup> As pointed out by Hülsmann (2015), there was a systematic mistranslation of the German word *Umlaufsmittel*, which was translated as "credit," while "fiduciary media" would have been the more appropriate term. This unfortunate choice of word in English, Hülsmann argues, obscured the analysis formulated by Mises.

<sup>29</sup> Given that only the roles of Hayek, Keynes, Sraffa and Knight are elaborated upon fully in this work, a few words are in order regarding the participation of the rest. Robbins did not publish himself, but aided Hayek in this academic battle against the ideas of Keynes, as vividly described in Wapshott (2011). As recounted in Caldwell (2003), Myrdal and Hicks joined with their own thoughts on the role of money and the meaning of equilibrium in a money-using, dynamic world, and Myrdal added his own distinction of "ex ante / ex post" expectations, a line of reasoning that would be an interesting subject matter to follow up on today as well. However, a perusal of Hicks (1967) reveals this essay as sympathetic to the idea that Hayek had something important to convey—only holding it to be disguised in a flawed framework—but, unfortunately, Hicks seems not to have grasped the fundamental thesis of the circulation credit theory. Kaldor defended Hayek's work in the debate in the late 30's, but had swung around in 1942, in an article mainly critiquing *The Pure Theory of Capital* (1941), a later publication by Hayek.

debate. Perhaps this is not surprising considering that Mises published his German forerunner to *Human Action*, a 750-page volume, in 1940, which must have kept him busy during the 1930's. But consulting the pages of *Human Action*, published in 1949, one cannot escape the feeling the Mises followed and examined the main arguments raised in the debate closely since several get a treatment here, as will soon be seen.

When introduced to Great Britain, Hayek's theoretical stance, and the practical implications it seemed to suggest, was, as described by Kaldor (1942, p. 359), "diametrically opposed to the current trend of monetary thought." First, it fascinated many economists to think about capital in a way they had never been trained to do—a fascination capturing Kaldor himself. Coase (1994) described that Hayek's ideas first conquered most of the students and the staff of the school with remarkable ease, and that, for a while, they all "incorporated Hayek's approach in their own thinking" (pp. 19-20).<sup>30</sup> But this was not to last. Kaldor's account of the reason for decline in the interest was that on "second thoughts the theory was by no means so intellectually satisfying as it appeared at first. There were admitted gaps here and there in the first published account which was merely intended as rudimentary, and when one attempted to fill these gaps, they became larger, instead of smaller, and new and unsuspected gaps appeared—until one was driven to the conclusion that the basic hypothesis of the theory, that scarcity of capital causes crises, must be wrong" (1942, p. 359). It actuated "a remarkable crop of critics of *Prices and Production* in the pages of English and American journals the number of which could rarely have been equaled in the economic controversies of the past" (Kaldor, 1942, p. 359). Kaldor's conclusion was, thus, that the theory was abandoned on scientific grounds. Hicks, one of the figures of the debate at the time, was not as sure. He later wrote (1967, p. 203) that "[w]hen the definitive history of economic analysis during the nineteen-thirties comes to be written, a leading character in the drama (it was quite a drama) will be Professor Hayek. Hayek's economic writings [...] are almost unknown to the modern student; it is hardly remembered that there was a time when the new theories of Hayek were the principal rival of the new theories of Keynes. Which was right, Keynes or Hayek?"

Given the large extent of credit expansion that central banks are now aiming at, with the intent of ending the chapter of the Great Recession, the question of whether Hayek and Mises were right in their circulation credit theory is as relevant as ever. We will look into the critique published by the famous names Lord Maynard Keynes, Piero Sraffa and Frank Knight. These prominent economists have been chosen on two grounds: (1) they all stated themselves able to refute the validity of Mises' and Hayek's theory of the credit-boom and (2) they were among the most influential voices at the time, their words probably having an effects on many fellow economists. Both Keynes' and Sraffa's critique were written on the basis of *Prices and Production* while Frank Knight had the possibility to read some subsequent publications and take them into account in his critique. We, however, additionally have the publication of *Human Action* to consult (Knight's last article is a review of *Nationalökonomie*). We therefore have another standpoint than the critics we review. It might seem unfair that we can evaluate their arguments using also later material. But we are not ultimately interested in the prestige of particular works or authors, but instead want to examine *whether there is any truth to the proposition that a credit expansion will induce malinvestment and produce an unsustainable boom that will eventually have to end in crisis*. If material published after the critics had had their say helps us in this investigation, there is justification for taking interest in it.

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<sup>30</sup> Which he further commented in the following remarkable way: "what now strikes me as odd is the ease with which Hayek conquered LSE. I think this was in part the result of a lack of precision in the existing analysis or, at any rate, in our grasp of it, so that Hayek's analysis seemed to give a well-organised and fruitful way of thinking about the working of the economic system as a whole. As far as I can see, the Hayekian analysis did not make predictions *except in the sense that it explained why there was a depression*" [sic] (pp. 19-20, emphasis added).

## ANALYSIS OF CRITIQUE

It has been established above that a proper refutation of the circulation credit theory, given its epistemological basis, must either show that the premises upon which it rests are untenable, or it must be shown that the reasoning following upon the premises is logically fallacious. Notably, however, the circulation credit theory does not lend itself as easily to scrutiny of its premises as most modern economic theories do; while it is now commonplace to conscientiously state all the assumptions of a given theory before embarking upon deduction, the authors of the circulation credit theory do not perform this customary service. Part of the work for the examiner is consequently to detect those premises that constitute the basis of the circulation credit theory.<sup>31</sup> In his reply to Sraffa, Hayek stated that “the tendency for capital accumulated by ‘forced saving’ to be, at least partly, dissipated as soon as the cause of the ‘forced saving’ disappears [...] is, in a sense, a peculiar characteristic of my own theory of the credit cycle [...] and it is upon the truth of this point that my theory stands or falls” (Hayek, 1932b, p. 239). This, of course, is the essence of the circulation credit theory: that the boom created by credit expansion is inherently unsustainable and will only go on as long as renewed credit expansion continues to uphold the distortion of relative prices. For a critic of this proposition, it must thus first be established upon what premises and given what reasoning this depends. John Maynard Keynes, Piero Sraffa and Frank Knight all put forth what, in their opinion, made Hayek’s and Mises’ analysis untenable. The following analysis sets out to present their arguments and to examine whether these indeed fulfill the two criteria established as prerequisites for a refutation of the circulation credit theory: (1) to identify a premise or a line of reasoning which underpins the circulation credit theory in such a way that it must hold for the theory itself to hold and (2) to successfully demonstrate the invalidity of this premise or line of reasoning. If found that a given argument fails on either of these two criteria, effort need not be spent to evaluate the other, since only by fulfilling both will the opponent succeed in his refutation.

### *Critique by John Maynard Keynes: The relation between savings and investment*

At the beginning of the 1930’s, John Maynard Keynes was one of the most acclaimed economists of Great Britain, soon to have his complete breakthrough and greatly influence future economic theory. The harsh critique from such an authority when Hayek published his theory probably influenced many in considering it being refuted. Furthermore, the “Keynesian” ways of thinking had been fairly widespread in Britain even before the *General Theory* appeared in 1936 and Keynes’ impressive achievement was chiefly to provide a theoretical foundation for these prevalent ways of thought (Shenoy, 2009, pp. 1-2). The debate between Keynes and Hayek therefore reveals much of the yawning gulf between Hayek’s theoretical stance and the current thinking in England at the time. Indeed, it remains an open question to what extent Keynes and Hayek ever understood each other and carefully contemplated his opponent’s critique before discarding it, since they relied on very different visions of the market economy.<sup>32</sup> Their public debate in *Economica* reveals much confusion on part of both parties and several times they conceded themselves to not being sure

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<sup>31</sup> As discussed above, modern economic theories mostly avail themselves of assumptions that are known *not* to be true, but that enable or simplify the analysis. If such a method is employed, the assumptions must be most clearly stated. But the circulation credit theory is deduced by applying economic reasoning to our world as we know it, or, more accurately, as Mises and Hayek found it to be, which is probably the reason for why the premises are not as carefully given account of as economists are nowadays used to doing.

<sup>32</sup> The interested reader can turn to Garrison (2001) who has taken great care in contrasting the economic frameworks of Hayek and Keynes.

what the other one meant.<sup>33</sup> The debate started when Keynes published his now lesser-known *A Treatise on Money* (1930), which Robbins, as editor-in-chief for *Economica*, assigned Hayek to review.<sup>34</sup> At this time, Hayek's manuscript of *Prices and Production* was ready enough for allowing Keynes to read it, which, indeed, he did. Notably, they were both dealing with the same subject: the rate of interest and its relation to savings and investment. Keynes appointed Piero Sraffa to write the formal review of Hayek's work, but he too joined in reviewing *Prices and Production* by, in his reply to Hayek's review of *A Treatise*, dedicating as much effort in attacking Hayek's work as in defending of his own. After admitting that his response to Hayek's review had largely drifted into himself reviewing *Prices and Production*, Keynes remarked: "[t]he book, as it stands, seems to me to be one of the most frightful muddles I have ever read, with scarcely a sound proposition in it beginning with page 45, and yet it is a book with some interest, which is likely to leave its mark on the mind of its reader. It is an extraordinary example of how, starting with a mistake, a remorseless logician can end up in Bedlam" (Keynes, 1931, p. 394). The harsh language is probably evidence of how much was at stake. Their different doctrines were such that if economists endorsed one of them, it would have no choice but to discard the other, or it would find itself riddled with internal inconsistencies and fundamentally opposing policy suggestions.

A central thesis in Mises' and Hayek's theory is the two-headed proposition that, absent a credit expansion to producers, the market will tend to an equilibrium where the supply of savings equals the demand for loanable funds, but that a credit expansion creates a movement away from this equilibrium. This underlies the assertion that credit expansion will systematically induce malinvestment in the economy, making up the core of the circulation credit theory. Professor Keynes' main objections to this can be summarized as: (1) a change in the quantity of money *need not* bring about a discrepancy between savings and investment; (2) a discrepancy between savings and investment may very well come about *without* any change in the quantity of money and (3) the classical theory of the rate of interest is fallacious. These points of contention will now, in the following, be supplemented by Keynes' arguments and then subjected to investigation.

*Proposition (1):*

*A change in the quantity of money need not bring about a discrepancy between savings and investment*

Mises and Hayek assert that a change in the quantity of money, if extended to producers, will change the relationship between savings and investment, and create disequilibrium between the two. Keynes contested this claim and challenged it with the following example: "to indicate a principle by means of an illustration, that, if,

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<sup>33</sup> Hayek laments in the first part of the review of the *Treatise*: "unfortunately, the exposition is so difficult, unsystematic, and obscure, that it is extremely difficult for the fellow economist who disagrees with the conclusions to demonstrate the exact point of disagreement and to state his objections. [...] It is only with extreme caution and the greatest reserve that one can attempt to criticise, because one can never be sure whether one has understood Mr. Keynes aright" (Hayek, 1931a, p. 271). A few years later, Denis Robertson who had been working with Keynes on his *General Theory* wrote a letter to Keynes before the publication: "I don't think these pages (192–93) are at all a fair account of Hayek's own exposition. In his own queer language he is saying that the fall in the rate of interest will so much increase the demand price for machines (in spite of the fall in the price of their products) as to make it profitable to produce more machines" (see letter from Denis H. Robertson dated February 3, 1935 in volume 13 of *The Collected Writings of John Maynard Keynes*, 1973, p. 504). To this, Keynes responded: "Thanks for the reference to Hayek which I will study. I do not doubt that Hayek says somewhere the opposite to what I am here attributing to him" (p. 519). However, the passage was never changed before publication—if this was because Keynes never took a second look at it or if, after careful consideration, he did not agree with Robertson, will remain unknown to us.

<sup>34</sup> The review was published in two parts: *Reflections on the Pure Theory of Money of Mr. J. M. Keynes* (August 1931) and *Reflections on the Pure Theory of Money of Mr. J. M. Keynes continued* (February 1932).

desiring to be more liquid I sell Consols [British government bonds] to my bank in exchange for a bank deposit and my bank does not choose to offset this transaction but allows its deposits to correspondingly increase, the *quantity of money is increased without anything having happened to either saving or investment*" (Keynes, 1931, p. 391, emphasis added).

*Proposition (2):*

*A discrepancy between savings and investment may very well come about without any change in the quantity of money*

Relatedly, Mises and Hayek claim that the interest rate will tend to the rate equalizing the supply of savings and demand for loanable funds, just as prices in general are set by the interaction of supply and demand. Keynes, however, explicitly denied this proposition. The argument set forth in the debate of 1931 was that money could be advanced to entrepreneurs "either to meet losses or to provide for new investment" (p. 390). Thus, suggesting that the stock of savings is divided into *two* streams, one called new investment and one meeting losses, Keynes argued that a discrepancy between savings and investment will (presumably always?) manifest itself even without a change in the quantity of money.

*Proposition (3):*

*The classical theory of the rate of interest is fallacious*

The last proposition bears affinity to the first two, but goes more to depth on the relationship between savings and investment. It was set forth in the *General Theory of Employment, Interest and Money* (1936) and neither Mises' nor Hayek's name are mentioned in connection with it since what Keynes went against was a common denominator for the whole profession at the time: the classical theory of the interest.<sup>35</sup> In the debate in 1931, when Hayek understood that Keynes did not agree on what Hayek saw as perfectly elementary, namely that the interest rate is the equilibrium rate on the market of supply and demand for loanable funds and that the rate will decrease when savings are increased, he was baffled and stated that "Mr. Keynes' assertion that there is no automatic mechanism in the economic system to keep the rate of saving and the rate of investment equal might with equal justification be extended to the more general contention that there is no automatic shift in the economic system to adapt production to any other shift in demand" (Hayek, 1931b, p. 401). If we do not believe this market to ever set itself to equilibrium, are we to throw out the entire body of Theory of Supply and Demand, Hayek wondered? In the *General Theory* came the answer. Keynes argued that what the Classicals had missed was that since saving corresponds to a proportion of people's income, this translates into their level of income being paramount to the level of saving. And since the level of income will be affected by the rate of investment, which in turn is affected by the saving choices people make, there is never a shift in *only* the supply or demand curve for loanable funds, but always in both: "[t]he traditional analysis has been aware that saving depends on income but it has overlooked the fact that income depends on investment, in such a fashion that, when investment changes, income must necessarily change in just that degree which is necessary to make the change in saving equal to the change in investment" (Keynes, 1936, p. 118). What happens, Keynes maintains, is that when consumption is withdrawn, entrepreneurs cannot sell as much as before and will cut back on their expenses by, among other things, laying off workers, thus decreasing the income of the economy. Keynes concludes: "decreased readiness to spend will be looked on in

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<sup>35</sup> The only place where Keynes *directly* mentions Mises' and Hayek's theoretical works in his famous *General Theory of Employment, Interest and Money* and criticizes their standpoint, seems to stem from a misunderstanding of their position. For a discussion on this, see Huerta de Soto (2009, p. 557).

quite a different light if, instead of being regarded as a factor which will, *cet. par.*, increase investment, it is seen as a factor which will, *cet. par.*, diminish employment" (p. 118). And here originates the notion, familiar to any modern student in economics, that consumption and investment move together in the short run.

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### *Analyzing Proposition (1)*

The proposition fulfills the criterion of identifying a fundamental argument of the circulation credit theory, namely the one that a credit expansion will generate a discrepancy between savings and investment. A careful consideration of the illustration of the Consol shows, however, that it does not prove what Keynes wants it to. Let us walk through the scenario in two steps. A government bond is, by definition, credit extended to the government. If the quantity of money were completely unchanged, a credit to the government would have to be offset by someone saving an equal amount of money somewhere else. However, if, as has been common throughout history, the government is lent credit by banks printing the money for this purpose, the quantity of money has changed and a credit expansion has occurred. Since the government might not want to get all the money in cash, they might open a deposit account at the bank, which increases the deposits of the bank. The bank might just "let the money sit there," but this does not change the fact that, thanks to an increase in the quantity of money, investment is now allowed to exceed saving. This principle does not change with the specific scenario above, involving the private savings of an individual. In this scenario, the Consol was first sold to an individual. The individual thus saved, and the government got credit. With time, the individual decides that she wants to dissave, *i.e.* to sell the Consol to someone else, who can "take over" the saving. This could, for example, be done by selling it to another individual. But instead the Consol owner goes to the bank, which, in Keynes' scenario, prints money to cover the buy (since, in the scenario, the quantity of money has increased). The individual is now free from its obligation to save while at the same time the government does not need to withdraw investment. Due to the increased money supply, the relationship between investment and saving has been altered. Or phrased differently, the change in the quantity of money in Keynes' own example has allowed investment to exceed saving, despite his assertion to the contrary.

### *Analyzing Proposition (2)*

The argument that savings and investment need not always be equivalent—even if the quantity of money and the velocity of circulation remain unchanged—since savings may be advanced to entrepreneurs in order to meet losses (and this cannot be regarded as investment) seems, *prima facie*, a logically consistent objection. However, examining the argument closer, a change of definition is revealed. The definition of saving employed by Hayek, as he cleared up in the reply, was the "old-fashioned way as refraining from any expenditure on consumption which would be possible without diminution of the value of existing capital" (Hayek, 1931b, p. 402).<sup>36</sup> Hayek's definition of savings therefore precludes identifying the means that are advanced to entrepreneurs in order to meet losses as saving. In other words, what Keynes did was solely to change Hayek's definition of savings into his own and to

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<sup>36</sup> After Hayek defined this in his rejoinder, Keynes asked him to elucidate the term anew in their private correspondence, and several letters went back and forth between the London School of Economics and Cambridge where they discussed the meanings and definitions of important terms such as saving, investment, velocity of money, effective circulation, and so on (see Caldwell, 1995), telling of the difficulties these two theoreticians experienced in communicating with each other, and, consequently, in understanding each other's theoretical stances.

prove that, using a definition different from Hayek's, Hayek's proposition was no longer valid. However, as long as Keynes does not disprove Hayek in his own terminology or prove this terminology to be inadmissible, this does not succeed in refuting the circulation credit theory.<sup>37</sup>

### *Analyzing Proposition (3)*

The classical theory asserts that an increase in saving will *promote* investment since it makes more resources available for entrepreneurs, while Keynes held that an increase in saving, being tantamount to a decrease in consumption, will have a *depressing effect* on investment; for the Classics, consumption and investment had a negative covariance, for Keynes the covariance was of positive sign. Keynes' line of argument thus questions the scenario of enhanced saving resulting in an aggrandizement of the capital structure that Hayek availed himself of in *Prices and Production*, and, consequently, Keynes' proposition questions the soundness of Hayek's whole mode of analysis in juxtaposing the mechanisms of increased saving (figures 3 and 4) with the mechanisms of credit expansion (figures 5 and 6). The criterion of identifying a fundamental argument of Hayek's circulation credit theory is thereby fulfilled, and we turn to examining criterion number two.

Let us start by noting the trivial, yet oft forgotten, fact that to hold the market to be self-equilibrating is emphatically not the same thing as asserting that it will always be in equilibrium. In other words, neither Mises nor Hayek would deny the *possibility* of Keynes' assertion that increased savings can decrease investment. But we must identify *where* Keynes' and Hayek's views diverge. The answer is in their different suppositions of the way the entrepreneurs interpret the signal of increased saving. A diminution of consumption necessarily means a willingness to consume less in the instant that the decision is made. But the question relevant for the entrepreneurs is what it signals about the future—do consumers save in order to consume more in the future, or do they signal general unwillingness to consume from now on? The entrepreneur cannot know for sure. But this is not something new—the role of the entrepreneur is always to provide for the unknown future and those less apt than their peers at anticipating the future needs of consumers will automatically be weeded out by market competition. To assume that entrepreneurs will, *on the aggregate*, reduce investment is to assume that they will, *as a group*, interpret the decrease in savings as a signal not only of less propensity to consume today, but also less propensity to consume in the future, and consequently not make use of the increased means at their disposal. Both Mises and Hayek would agree that this can happen in times of distress and this will, they might add, be one of the characteristics of the uncertainty during the bust. But to assume that this will *necessarily* be true relies on the assumption that an increase in savings will never be a manifestation of consumers' preference to invest in the future relative to today, thus assuring demand for future goods, and that it will never be interpreted as such by any single entrepreneur, whose profits would induce similar behavior by others. While Keynes asserts that investment, as an aggregate, will be restricted, Hayek points to that it must be distinguished between what happens at the different stages of production. Entrepreneurs in the consumer goods industries might very well curtail production—indeed, they should. But it does not follow from this that *all* entrepreneurs should, or will, do so. Instead, investment project can now be undertaken that lengthen the period of production so that, on the whole, production is not decreased, but *rearranged*, to suit the new fundamentals of consumer preferences. Consequently, what Keynes did in the *General Theory* was only to shift focus to the scenario, in his eyes neglected by economic theory, of decreased

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<sup>37</sup> Unfortunately, the terminological gymnastics underlying Keynes' argument was rather symptomatic of most of their discussion; both of them were often liable to superimposing their own terminology on the other's, preventing any real constructive criticism which, potentially, could have been advanced.



consumption perceived to signal less rather than more willingness to consume in the future. However, this is not tantamount to rebutting, in principle, the (“Hayek”) scenario of the entrepreneurs making use of the increase in voluntary saving in order to embark upon longer processes of production.

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Inquiry into Keynes’ main propositions and arguments summarized here shows none of these to fulfill both criteria of refutation. Now, the focus is instead turned to the official reviewer of the circulation credit theory’s entrance onto the Anglo-Saxon stage: Piero Sraffa.

***Critique by Piero Sraffa:  
The impossibility of neutral money and “the” natural rate***

Keynes, as editor-in-chief of the *Economic Journal*, assigned Piero Sraffa to officially review *Prices and Production*. Less than a year after Hayek’s arrival to London, Sraffa published several pages of scathing review, which was the only publication by Sraffa during a twenty-five year period (Lachmann, 1986), telling of the great importance he attached to countering the new influences of Hayek’s economics. Sraffa opened his review by stating that there is “one respect in which the lectures collected in this volume fully uphold the tradition which modern writers on money are rapidly establishing, that of unintelligibility” (1932a, p. 42) and continued: “from the beginning it is clear that a methodical criticism could not leave a brick standing in the logical structure built up by Dr. Hayek” (p. 45). At this time it was widely held that rivaling schools of economic thought belonged to the past, and that economic science had reached unity. The Hayek-Sraffa battle, however, did not harmonize with this. Lachmann (1986) wrote: “[w]hat was the ordinary economist of 1932 to make of all this? The feeling prevailing in London and other British universities was one of utter bewilderment” (p. 142) and continues by describing the influence that the review, in his view, had for Hayek’s theory: “[t]he duel [...] did the reputation of Austrian economics a good deal of harm. Hayek’s authority as an economic thinker of the first rank had been challenged with some vehemence in the august pages of the *Economic Journal*. Nobody knew what to make of it. Some of Hayek’s recently gained supporters began to hesitate. When, four years later, the Keynesian revolution broke out, its assault forces encountered not a phalanx, but divided ranks” (1986, p. 157).

That Sraffa did not agree the least with Hayek’s exposition of the circulation credit theory is clear to anyone reading the review. The substance of the disagreement, however, was more nebulous. Knight, following the debate from the other side of the Atlantic, wrote in a letter in December 1932 to Oscar Morgenstern: “I wish [Hayek] or someone would try to tell me in a plain grammatical sentence what the controversy between Sraffa and Hayek is about. I haven’t been able to find anyone on this side who has the least idea” (Lawlor & Horn, 1992, footnote on p. 318). But equally convoluted as fellow economists perceived the arguments to be, equally evident was Sraffa’s opinion that Hayek was not able to defend his stance in the reply, generating a triumphant rejoinder from Sraffa. Standing, as we do, on the other side of the Sraffa’s publication in 1960, *Production of Commodities by Means of Commodities*, with a foreword promising to “serve as the basis for a critique of [the marginal theory of value and distribution]” (p. viii), the force of the clash between Sraffa and Hayek is more understandable. The Austrian school, to which Hayek belonged, was, and is, a school of thought meticulously applying the marginal theory of value and Sraffa’s ambition to discard it—which, however, was never explicit in his review of *Prices and Production*—must have greatly influenced the way he viewed the circulation credit theory. Sraffa’s own theoretical stance has not survived with

time either, but he nonetheless directed criticism toward the circulation credit theory that deserves careful consideration, especially since, at least according to Lachmann's historical account, it was perceived as devastating by contemporary economists. Sraffa's attack concerned two concepts whose validity he saw as fundamental parts of Hayek's exposition of the circulation credit theory: the concepts of the neutrality of money and the natural rate of interest. His propositions were that (1) money can never be neutral, unless it does not exist and (2) there is no *the* natural rate of interest.<sup>38</sup>

*Proposition (1):*

*Money can never be neutral, unless it does not exist*

Sraffa saw Hayek's starting-point in treating money as neutral as long as credit expansion is not introduced as an impermissible one. In his review, he sarcastically remarked that "[t]he starting-point and the object of Dr. Hayek's inquiry is what he calls 'neutral money;' that is to say, a kind of money which leaves production and the relative prices of goods, including the rate of interest, 'undisturbed,' exactly as they would be if there were no money at all [...]. This method of approach might have something to recommend it, provided it were constantly kept in mind that a state of things in which money is 'neutral' is identical with a state in which there is no money at all" (Sraffa, 1932a, p. 42). Two pages later he continues: "[h]aving thus reduced money to utter insignificance, it is easy for Dr. Hayek to prove to his own satisfaction that, if its quantity is kept constant, money is 'neutral' in the sense that after a disturbance, such as an increase of saving, the new equilibrium of production and of relative prices is reached as smoothly as if no money existed" (Sraffa, 1932a, p. 44).

*Proposition (2):*

*There is no the natural rate of interest*

Furthermore, Sraffa argued that Hayek's use of the concept of *the* natural rate of interest implicitly supposed that there must be a single rate of interest prevailing in a barter economy, but that such a supposition does not hold: "[i]f money did not exist, and loans were made in terms of all sorts of commodities, there would be a single rate which satisfies the conditions of equilibrium, but there might be at any one moment as many 'natural' rates of interest as there are commodities, though they would not be 'equilibrium' rates. The 'arbitrary' action of the banks is by no means a necessary condition for the divergence; if loans were made in wheat and farmers (or for that matter the weather) 'arbitrarily changed' the quantity of wheat produced, the actual rate of interest on loans in terms of wheat would diverge from the rate on other commodities and there would be no single equilibrium rate" (Sraffa, 1932a, p. 49).

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*Analyzing Proposition (1)*

It must be distinguished between the two different ways in which Hayek uses the concept of neutrality of money in *Prices and Production*, namely, firstly, as a

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<sup>38</sup> I have here disregarded one of the main points of contention of Sraffa's review, namely the overall questioning of "the tendency for capital accumulated by 'forced saving' to be, at least partly, dissipated, as soon as the cause of the 'forced saving' disappears," as Hayek summarizes in the reply (1932b, p. 239), since, in my view, this is the essence of the circulation credit theory. In other words, this is what the whole analysis concerns and including this as an explicit point of objection from Sraffa would mean to double-work the entire analysis.

methodological starting-point in order to integrate his theory of credit expansion with the general framework of static equilibrium theory and, secondly, as a benchmark for policy discussion. Regarding the latter, a discussion on neutral money arrives after the exposition of the circulation credit theory in *Prices and Production*, in discussing the case for and against an “elastic” currency, *i.e.* one that can change in supply. Here Hayek relaxes the assumption that the velocity of money is held constant since he sees several reasons for why this velocity could fluctuate, not only as a result of the waning of “animal spirits,” but also, for example, due to changes in the ratio of goods exchanged for money compared to the total amount of goods sold. The discussion essentially concludes the practical impossibility of keeping money, and the interest rate, completely neutral. From Mises’ article the *Non-Neutrality of Money*, we learn that he would also assert the impossibility of money ever being neutral in economic reality: “we should never forget, that the state of equilibrium is purely hypothetical, that this concept is nothing but a tool for our mental work [...] a changeless world would be a dead world. We do not just have to deal with death, but with life, action, and change. In a living world there is no room for neutrality of money” (Mises, [1938] 1990, p. 75). In terms of neutral money as a policy benchmark, not much disagreement arises between Sraffa, Hayek and Mises.

Greater disagreement arises regarding the methodological starting-point of Hayek’s exposition of the circulation credit theory. Sraffa fully legitimately points out that when Hayek treats the first scenario—an increase in saving before credit expansion is introduced, the transition from figure 3 to figure 4—the mechanisms of change are described in terms of money, but the money works only as a *numéraire* and, in all respects, the economy functions just like a barter economy. Indeed, after the transition from a shorter to a longer capital structure through a voluntary increase in saving, Hayek states that the effect realized “is one which fulfills the object of saving and investing, and is identical with the effect which *would have been produced if the savings were made in kind instead of in money*” ([1931] 1967, p. 53, emphasis added). While Sraffa regarded Hayek’s objection to the rather vague concept of the general price level as partly well-founded, he was abhorred in finding that Hayek discarded everything a standard textbook on money attributes as cardinal aspects of money except for its function as a medium of exchange: “[t]here are no debts, no money-contracts, no wage-agreements, no sticky prices in his suppositions. Thus he is able to neglect altogether the most obvious effects of a general fall, or rise, of prices” (Sraffa, 1932a, p. 44). Sraffa is right; Hayek neglects all these important aspects. But it was not Hayek’s intent in *Prices and Production* to formulate an encompassing theory of a fluctuating money economy. The intent was to find the essential differences between a non-monetary and a monetary economy under the then existing—and still existing—organization of money and credit and to demonstrate that if monetary factors are integrated with the well-established self-equilibrating theory of static equilibrium, it can be shown that a change in money supply channeled to producers can induce disequilibrium of a kind in the economic system “which could not be explained without recourse to these monetary factors” (Hayek, 1932b, p. 238). The question, then, is not whether debt, money-contracts, wage-agreements and sticky prices are important monetary aspects of an economy—of course they are—but whether their introduction in Hayek’s theoretical framework would change the argument of the circulation credit theory in any essential way. This, however, is not clear, and neither is it proven by Sraffa. Since prices and wages are generally sticky downwards rather than upwards, this would not affect the mechanisms during the boom, but would only enhance the pain during the bust. Similarly, debt written in nominal terms would also aggravate the situation during the bust—as famously described in Irving Fischer’s debt deflation theory—but it is not evident that neither the role of money in debt nor in contracts would, in any important manner, change the mechanisms of the unsustainability of the boom. Therefore, since Sraffa did not show in what way his remark would bear the significance towards the circulation credit theory as he implied it had, his objection does not fulfill the second criterion of

refutation—and, perhaps, not even the first.

### *Analyzing Proposition (2)*

Inquiry into Sraffa's second proposition reveals a fundamental confusion of concepts. Hayek borrowed the concept of the natural rate of interest from Wicksell and introduces it in *Prices and Production* ([1931] 1967, p. 23) as the equilibrium rate of interest that equals the supply and demand of savings (and then rather sloppily uses the terms natural and equilibrium rate completely interchangeably). However, this was not Wicksell's definition of the natural rate, as pointed out by Bertil Ohlin in the foreword to Wicksell's *Interest and Prices* ([1898] 1962, p. xiii). The confusion arises from Wicksell having defined two different, yet closely related, concepts: the natural rate and the normal rate. Of this Hayek was evidently aware, since it could be read in his *Monetary Theory and the Trade Cycle* (1933): "Wicksell's change in terminology is linked up with a certain ambiguity in his definition of the 'natural rate.' Having correctly defined it once as 'that rate at which the demand for loan capital just equals the supply of savings' he redefines it, on another occasion, as that rate which would rule 'if there were no money transactions and real capital were lent *in natura*.'" Hayek continues: "[i]f this last definition were correct, Dr. G. Halm would be right in raising, against the conception of a 'natural rate,' the objection that a uniform rate of interest could develop only in a money economy, so that the whole analysis is irrelevant" (pp. 210-211). Unfortunately, Hayek missed that Wicksell had not christened both the natural rate.<sup>39</sup> Wicksell called the latter, which Hayek saw as somewhat problematic, the *natural* one, and the former, which Hayek actually used, the *normal* one. No wonder then that Sraffa perceived of his rebuttal of the usefulness of the term "the natural rate of interest" as a rebuttal of the circulation credit theory and put much emphasis on this argument. The issue is the following. In a stationary society, the normal and natural rates will coincide. But outside a stationary society the natural rate is a nonsensical term lacking any definition, something that Sraffa took great care in impressing upon the reader. In a changing money-less society, every commodity will have its "own-rate" and there will only prevail a *tendency* of the equalizing of all these own-rates. None of these rates will, however, have a more legitimate claim than any of the others to be "the" natural rate. Since Hayek treated the case of a *changing* society, it would be impermissible to make use of the concept of *the* natural rate of interest defined as if real capital were lent *in natura*. In his reply, Hayek addressed Sraffa's objection, yet evidently failed to clear up the confusion, since Sraffa triumphantly wrapped up his rejoinder (1932b, p. 251) in the following manner: "Dr. Hayek now acknowledges the multiplicity of the 'natural' rates, but he has nothing more to say on this specific point than that they 'all would be equilibrium rates.' The only meaning (if it be a meaning) I can attach to this is that his maxim of policy now requires that the money rate should be equal to all these divergent natural rates." The last statement here is clearly nonsensical, which was meant as self-explanatory.

It is remarkable that Hayek failed to clearly convey in his reply that the circulation credit theory was never based on Wicksell's natural rate, but the normal rate; the interest rate on the savings-loans market, which equilibrates supply and demand. And more importantly, Sraffa's reason for why the natural rate lacked definition in a

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<sup>39</sup> In the foreword to the Swedish edition to *Lectures II*, Wicksell informs the reader of his addition of the more "concrete" concept of the normal rate. However, this stands nowhere to read in the foreword to the translated English edition. Whether the reader was informed by this in the German edition is beyond my linguistic skills to investigate. [In Swedish, Wicksell had written the following: "Så har jag vid sidan av det något för svävande och abstrakta begreppet naturlig kapitalränta uppställt det mer konkreta, normal ränta, d. v. s. den räntefot, vid vilken efterfrågan efter nytt kapital jämnt täckes av den samtida sparverksamheten" (Wicksell, [1906] 1929, p. vi)].

changing economy does not apply to the normal rate, which should be no less well-defined and useful a concept than the equilibrium price on any given market. Furthermore, Sraffa's comment that the arbitrary action of the banks is not a necessary prerequisite for supply and demand to fail to correspond to each other demonstrated by the example that if loans were made in wheat, or any arbitrary commodity, "and farmers (or for that matter the weather) 'arbitrarily changed' the quantity of wheat produced, the actual rate of interest on loans in terms of wheat would diverge from the rate on other commodities and there would be no single equilibrium rate" (Sraffa, 1932a, p. 42) is to miss the fundamental thesis of the circulation credit theory. Both Hayek and Mises would agree that no single equilibrium interest rate would prevail in a changing economy, but only a tendency toward unity. Both would also completely concede to the point that unforeseen and "arbitrary" circumstances disequilibrate markets with the result of supply and demand failing to correspond to each other. Mises would add to this that this is *always* the case; the market is *never* in equilibrium. The proposition of the circulation credit theory is, solely, that as long as credit expansion is not undertaken, the market will always *tend* to equilibrium, as described by the general framework of static equilibrium theory, and that the introduction of credit expansion does away with this tendency and leads the economy along a path *away* from equilibrium. If the amount of wheat produced was substantially decreased because of the weather, the price would tend to go up until supply and demand are again in correspondence. Similarly, if banks could only *transfer* credit, not extend it by increasing the supply of money, any change in the supply of savings or the demand for investment would immediately set in motion a tendency for a change of the interest rate, which would not cease until supply again equaled demand. The crucial building-block of the credit circulation theory is that, under the current monetary organization, this tendency is *not* promptly set in motion because the supply of money is not fixed. It would be more equivalent to the farmer extending far more wheat credit than he could actually supply, allowing people to make plans with the deception that they had secured wheat for the winter, a mismatch which would not be discovered until the creditors came to claim their wheat and found that the demand, to which everyone had a legitimate claim, far exceeded the supply.

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Sraffa's review forcefully argued the invalidity of Hayek's exposition of the circulation credit theory in *Prices and Production*, but, on closer look, failed to demonstrate, partly due to terminological confusion, exactly where this invalidity resides. Let us now look into the arguments of the third opponent: Frank Knight.

### *Critique by Frank Knight: The flawed foundation of Austrian capital theory*

On the other side of the Atlantic, Frank Knight, one of the founders of the Chicago School, put much energy into the battle and focused on the aspect of capital. Furthermore, Knight read German and was one of the few reviewers of Mises' *Nationalökonomie*, the German forerunner to *Human Action*. The "capital controversy," mainly between Hayek and Knight, appeared in various articles and Kaldor remarked that the arguments were often convoluted and difficult to grasp and, perhaps because of this, that the discussion did not make much headway (Kaldor, 1937). What makes Knight's critique sometimes difficult to examine is that he mostly attacks what he labels the "Austrian capital theory," essentially meaning the work of Böhm-Bawerk, but not every element of Böhm-Bawerk's work was carried over to the circulation credit theory. Quite on the contrary, Mises, despite the high regard he held for his predecessor, explicitly went against what Böhm-Bawerk saw as his most essential contribution, namely the theory of interest. As a consequence, not every

swing that Knight takes at the “Austrian capital theory” will be relevant for the circulation credit theory, and some of his arguments put forth during the debate have consequently been disregarded here. But there still remain three important points of contention, two which identified building-blocks in the capital theory foundation of the circulation credit theory and one which brought up Mises’ theory of interest. These arguments can be summarized as: (1) there is no “period of production” except for zero or “all history”; (2) it cannot be shown that an increase of the quantity of capital necessarily implies the adoption of more “roundabout” processes and (3) the (real) rate of interest equals the marginal product of capital and is not determined by time-preference.

*Proposition (1):*

*There is no “period of production” except for zero or “all history”*

The period of production is a fundamental analytical tool underpinning the explanation of the unsustainability of the credit-induced boom. However, Knight has two reasons that, according to him, upset any calculation of the determinate length of the process of production, rendering the calculation impossible (see primarily Knight, 1933 and Knight, 1941), and, as such, making the concept meaningless. Firstly, if capital goods are constructed for the production of a certain good, this will be accomplished with the help of capital and labor that was, for a very considerable part, if not all, in existence already prior to the project. Secondly, even considering an extreme uniqueness of the project, the liquidation of the capital goods after completion “will involve turning back into the production stream of society as a whole a large fraction of all the wealth-value tied up in it” (Knight, 1933, p. 222). In short, it is impossible to impute any unit of production to any time-segment of productive activity if it avails itself of any intermediary goods. The period of production is either “all history” or zero.

*Proposition (2):*

*It cannot be shown that an increase of the quantity of capital necessarily implies the adoption of more “roundabout” processes*

Both Hayek and Mises assert that as credit expansion occurs, there will be an increase in the quantity of capital due to producers’ increased purchasing power, and this will lead to elongation of the capital structure. Had, instead, all new capital been dedicated to short production processes, the crisis in the manner described by the circulation credit theory would not arise and it is clear that Hayek’s graphical framework would prove unsupportable. Knight identifies this crucial building-block of the circulation credit theory and claims that it can never be said with certainty that an increase of capital will lead to a lengthening of the production process. Commenting on *Prices and Production*, Knight writes: “[h]e [Hayek] asserts or assumes, on the average of at least once to a page, that he has proved, or is proving, or that it is self-evident and requires no proof, that a change in the amount of capital in society is identical with a change in the ‘investment structure,’ an increase corresponding to a lengthening, and a decrease to a shortening, of that structure” (1935, p. 77). But according to Knight, “[t]he fact that time is required for changing from any system to any other is confused with change in the length of the cycle itself, is one of the basic fallacies of the modern theory” (1935, p. 81).

*Proposition (3):  
The (real) rate of interest equals the marginal product of capital and  
is not determined by time-preference*

Lastly, it was seen in the description of the circulation credit theory that Mises relied on the time-preference theory of interest for his explanation of the mechanisms of a credit-induced boom, a theory of interest contested by Knight. This third proposition was the main theme in Knight's review of Mises' *Nationalökonomie*. He forcefully summed it up at the end of the article as:

... capital resources are produced under the condition of constant cost. Consequently, their price (and reciprocally the rate of interest) is determined by this cost, *regardless of men's utility judgments or preferences, meaning in this case the relative preference for current consumption and future income flow* [...] the general conclusion is that the equality [...] between the rate of yield and the cost of producing (resources yielding) a unit perpetual flow of income [...]. This conclusion states the general theory of the rate of return on investment, and the general theory of interest, for conditions at all like those of the real world (Knight, 1941, pp. 425-426, emphasis added).

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*Analyzing Proposition (1)*

In objecting to the concept of a period, Knight fulfills the criterion of identifying a concept that must hold for Mises' and Hayek's analysis to hold. The period of production signifies that time interval during which factors of production are employed but no consumption goods have yet reached fruition, a time interval of cardinal importance in explaining the unsustainability of a credit-induced boom. And Knight's point on the impossibility of calculating a "period of production" seems a legitimate concern to raise given the formulation in *Prices and Production*. When Hayek uses the concept "average time interval between the application of the original means of production [i.e. land and labor] and the completion of the consumers' goods" to show that production becomes more capitalistic when this average increases (Hayek, [1931] 1967, p. 42), we cannot but concede to Knight's argument.<sup>40</sup> Could we ever compute this average, tracing back the history of the capital goods? And even if we could, how can this be a useful concept?

The average period that Knight criticizes is the backward-looking average that Böhm-Bawerk had in mind when developing the concept of a period of production. Illustrating the concept in work, Böhm-Bawerk gave the illustration that "the boy who whittles a willow whistle with his pocket knife is, strictly speaking, only continuing an operation begun by the miner who centuries ago dug the first shovelful of earth for the sinking of the mine shaft that was used to bring up the iron for the blade of the boy's pocket knife." But Knight failed to realize that the circulation credit theory, in its essence, does not employ the backward-looking period of production, but the forward-looking period of production counted from today on until the fruits, viz. the consumption goods, of a particular investment project, are ready for consumption. Mises makes this clear in *Human Action*:

Neither acting man himself nor economic theory needs a measurement of the time expended in the past for the production of goods available today. They would have no

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<sup>40</sup> Hayek's use of the average of the period of production is also rather irreconcilable with his earlier remark in the same work, namely that "neither aggregates nor averages do act upon one another, and it will never be possible to establish necessary connections of cause and effect between them as we can between individual phenomena, individual prices, etc. I would even go so far as to assert that, from the very nature of economic theory, averages can never form a link in its reasoning" (Hayek, [1931] 1967, p. 5).

use for such data even if they knew them. Acting man is faced with the problem of how to take best advantage of the available supply of goods [...] For the achievement of this task he must know the length of the waiting time which separates him from the attainment of the various goals among which he has to choose. As has been pointed out and must be emphasized again, there is no need for him to look backward to the history of the various capital goods available. Acting man counts waiting time and the period of production always from today on (Mises, [1949] 1998, pp. 490-491).

Equivalently, just as the history of the project's capital goods is irrelevant for the investment, so is, apart from the price that is hoped to be obtained at liquidation, the time of the capital goods' further assistance to production irrelevant for the circulation credit theory. That Knight failed to realize this must in fairness be attributed to Hayek's exposition in *Prices and Production* which used a description of the period of production—the average period of production—more like the Böhm-Bawerkian than the Misesian concept, clouding the essence of the period of production underpinning the argument of the circulation credit theory.

### *Analyzing Proposition (2)*

The lengthening of capital structure due to credit expansion is, as already hinted at, an important brick in the logical structure erected by both Mises and Hayek. It is the concrete aspect of the term malinvestment. The first criterion is thus fulfilled and we turn to investigate the second. To examine whether an increase in the amount of capital need or need not imply a lengthening of the production process, *i.e.* a more capital-intensive method of production, we investigate both the scenario of starting in static equilibrium and the case of relaxing this assumption.

Starting from a position of static equilibrium, *i.e.* no idle resources of land and labor, it is, in fact, self-evident that an increase in capital cannot be employed without a change in production method, since land and labor cannot be scaled up together with capital. That this cannot constitute in a shortening of the production processes is also clear since this, by construction, would imply *less* capital-intensive methods, which, with more capital goods to employ, the existing amount of land and labor cannot support. The only way to find employment for the new amount of capital is therefore to embark on longer production processes.

Relaxing the assumption of static equilibrium and allowing there to exist idle resources in the form of land and labor, it is not as self-evident as before. But we might recall that since an increase in capital can only come about by the curtailment of consumption, this must necessarily imply a decrease in the demand for consumption goods relative to the demand for intermediate, or capital, goods. This means, as Hayek tried to convey in his triangles, that the entrepreneurs that choose to employ the new capital cannot all dedicate their investment projects to short periods of production, *i.e.* in stages close to the consumer goods, since these will have suffered from lowered demand. This is, thus, the reason that longer production processes will be embarked upon, because, simply, these are the ones that will pay. Another way to look at the matter is to realize that, all other things equal, people will always prefer the shorter production processes to longer ones. Given quantity and quality of a certain commodity to be produced, if there were to exist a *shorter* production process relative to the one in use, that gave the exact same output, the entrepreneur would prefer this one. Had there been a longer production process that yields the exact *same* output, the entrepreneur would *not* prefer this one. The tendency is, therefore, always to employ the shortest possible production given the ends aimed at and given the state of knowledge of the entrepreneur. There will, however, always exist *longer* processes that are *more* productive (in quantity or in quality) than the existing processes and that have not been embarked upon, for the reason that the economy cannot sustain these projects. If more resources become



available, however, the projects on the margin will become possible. Thus, an increase in the amount of capital goods will, on the whole, lead to longer processes.

It should be added, however, that, as Hayek remarks in one of his footnotes, the “lengthening of the structure of production need [...] by no means take exclusively or even mainly the form that the methods used in any individual line of production are changed. The increased prices in the earlier stages of production (the lowered rate of interest) will favour production in the lines using much capital and lead to their expansion at the expense of the lines using less capital. In this way the aggregate length of the investment structure of society might in the extreme case take place without a change of the method employed in any one line of production” (Hayek, [1931] 1967, p. 77). In other words, it must always be distinguished between the aggregate and the individual case. What happens in the aggregate need not necessarily happen for the individual entrepreneur. In this regard, but only in this regard, Knight’s proposition holds true.

### *Analyzing Proposition (3)*

As a finale of the current analysis, we arrive at the thorny issue of interest theory. Contemporary macroeconomic textbooks teach that the interest rate is, in the long run, equal to the marginal productivity of capital. This was what Knight argued during the 1930’s and 1940’s, and he won the battle of what was to be taught in the future canon. With Paul Samuelson’s use of this relation in his *Economics: An Introductory Analysis*, the best-selling economics textbook of all time, this theory had come to stay. Yet, contrary to the impression given in the textbooks, this is not a completely settled issue. The marginal productivity theory of interest has received critique which seems, as of today, to not been effectively countered.<sup>41</sup> Mises, in contrast, developed the time-preference theory of interest, which is the prevailing theory of interest for “Austrian economics,” and which provides the foundation for his exposition of the circulation credit theory.

But instead of embarking upon the issue of different theories of the interest rate, let us start by examining whether this dispute is a prerequisite to settle in order to settle the validity of the circulation credit theory. Recall the mechanisms of why credit-induced boom will induce malinvestment and end in crisis. The fundamental problem arises because investment projects are initiated which are not fully backed by the savings of the economy. The capital that goes into new investments exceeds the capital that has been saved, because banks have had the ability to loan to producers using credit expansion. None of these statements need reliance on the time-preference theory of interest for their explanation, or for elucidation of the problem. Nor does the assertion that the production processes will, on the whole, be lengthened, as seen above. The rest of the mechanisms set into play rely, it seems, on the Theory of Supply and Demand and the market forces of competition. In conclusion, then, while the time-preference theory of interest allows Mises an elegant exposition of the circulation credit theory, it does not seem strictly necessary to rely on it. Indeed, Hayek never supports his formulation on the time-preference theory, and abstains from contemplating upon the determinant forces behind the interest rate, other than viewing it as the price on the savings-loans market. In conclusion, whether one adheres to this interest theory or not need not, it seems, be decisive for the acceptance, or non-acceptance, of Hayek’s and Mises’ circulation credit theory.

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<sup>41</sup> The current [05/10/2015] entry in the Palgrave Dictionary on neo-Ricardian economics writes: “In the 1960s and 1970s the long-period versions of marginalist theory revolving around the concept of a uniform rate of return on capital were called into question on logical grounds. [...] While the criticism of the long-period versions of marginalist theory is irrefutable, as authors from Paul Samuelson to Andreu Mas-Colell have admitted, surprisingly this has not prevented the economics profession at large from still using this theory” (Kurz, 2015).

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Knight's first and second points of objection performed well in pinpointing relevant parts of the circulation credit theory, but failed to prove the theory invalid. Regarding the third, the theory of interest, it is not clear that this *needs* to be valid in order for the mechanisms of the circulation credit theory to maintain their logical consistency—although I do not claim to have proven this here—thus, it seems, failing on criterion number one.

*Today's critique:  
Irrationality*

Lastly, let us examine an argument that many trained economists today, being taught the dichotomy of rationality and irrationality, would probably want to raise against the circulation credit theory, namely:

*Proposition:  
The theory builds on the assumption that entrepreneurs are irrational*

It would be legitimate to counter to the circulation credit theory: *why* would entrepreneurs take loans when the interest rate is “artificially” low, since, by definition, it will have to be raised sooner or later?

*Analyzing the proposition*

Let us first state that to be rational is not the same thing as being all-knowing.<sup>42</sup> Thus, regardless of how one exactly defines rationality, the statement that entrepreneurs behave irrationally must rely on the notion that it is reasonable to assume that the entrepreneurs understand the fundamental problem of credit expansion to begin with, *and* that, those who do, could and would behave differently. There are several points to remark on this.

Firstly, as Lachmann (1943) pointed out in an article on expectations, which is, to the best of my knowledge, the only article discussing the circulation credit theory that Mises responded to,<sup>43</sup> expectations are formed on the basis of economic agents' *interpretation* of the events they see around them, which is, necessarily, a subjective process. To be able to state that entrepreneurs are irrational is to presume that they have correctly interpreted what happens when credit is expanded. Now, it becomes a curious argument for economists to say that the circulation credit theory does not hold water because (a) that would mean that entrepreneurs are irrational because (b) they would know that it is unwise to take loans when the interest rate is “artificially” low but (c) when monetary policy needs to promote investment, the interest rate should be lowered. Now some economists do not belong to category (c). But we can further note that it is a flattering view of the entrepreneurs, who have, for the most part, not studied economics, that they should (i) be able to, or have learnt by now, not to take loans when the interest rate is “artificially” low because (ii) they should have seen the trouble this causes, even though (iii) the canon of the

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<sup>42</sup> It should be noted that Mises argued the term “rational” to be a nonsensical concept in the sphere of economics. See Mises, 1949, pp. 18-21 for an elaboration of this stance.

<sup>43</sup> A response in which Mises boldly stated: “In the thirty-one years which have passed since the first edition of my *Theory of Money and Credit* was published no tenable argument has been raised against the validity of what is commonly called the ‘Austrian’ theory of the credit cycle. It was easy to prove that all objections brought forward were either futile or founded on a mistaken interpretation of the doctrine attacked” (Mises, 1943, p. 251).

economics profession has not understood it and (iv) since the entrepreneurs have not seen this, the theory cannot be right. It becomes another matter, of course, if the circulation credit theory would gain in vogue and entrepreneurs became generally familiar with it. Lachmann remarked, and Mises (1943) agreed with him, that it *was* a perfectly legitimate observation that the boom would only be induced if entrepreneurs were willing to use the means of the credit expansion, which, perhaps they should sooner or later realize, was not a good idea. Mises answered Lachmann by saying that “[i]n this thoughtful essay the author contends that ‘the Wicksellian theory appears to be based on a very special assumption, viz., of a capital market without a very strong mind of its own, always ready to follow a lead on the spur of the moment, and easily led into mistaking an ephemeral phenomenon for a symptom of a change in the economic structure. [...] I fully agree with this statement [...] but I want to point out that I did not fail to state the fact that my explanation of the trade cycle is based on such an assumption’ (Mises, 1943, p. 251). But the argument that it is possible that the booms and bust of this sort will disappear with time, as the entrepreneurs learn to see through the monetary organization, is very different from the one maintaining that the theory cannot be right *because* the entrepreneurs have not called the bluff yet.

Secondly, and more importantly, entrepreneurs who believe interest rates to be too low in times of credit expansion will still not be able to “act on” this to any substantial degree. Let us put ourselves in their shoes. They believe that the interest rate is, to different extents, “too low,” but *this does not mean that they know the, in their view, “true” interest rate, i.e. the equilibrium rate that would prevail were there no credit expansion, because this has no way of manifesting itself as long as credit expansion is pursued.* In other words, to borrow some terminology from game theory, to know (or, at least, believe) that a signal is distorted is emphatically *not* the same thing as knowing the true signal. And if they decided to wait for launching their business until a moment when there is no credit expansion, so as not to be tricked, they might have to wait for a very long time. Rather, the “rational” thing to do is to engage and invest in the boom, just like everyone else, but to try to predict the crisis and be in a “safe” position when it comes. This very much likens the fact that it might be “rational” to partake in a speculative bubble, even if the risks are clear to you, with the aim of trying to withdraw in just the right moment.

Thirdly, and perhaps most importantly, the market process will lack a strong mechanism that teaches entrepreneurs how to behave without them having to learn the theoretical workings of a credit expansion to begin with. The strength of market mechanisms generally is that they *provide entrepreneurs with incentives that are themselves filled with information, without the entrepreneurs needing to know or understand the information itself.* Exceptionally high prices due to a shortage of some sort provides strong incentives for entrepreneurs to supply these goods without having to know the reason for the shortage, or that there even is a shortage to begin with. This is what provides the market with its equilibrating forces. And with the case of a credit expansion, there is no such strong “selection process.”

Fourth, since the current recession is still lingering, perhaps we actually *do* see, in the current crisis, that entrepreneurs are somewhat reluctant to borrow at the conspicuously low rates. Something gives them cold feet. Indeed, if the circulation credit theory is right, it will be an interesting race as to whether it is the entrepreneurs or the mainstream economists that first realize it.

## DISCUSSING AND CONCLUDING

The reader has been navigated through the mechanisms and teachings of the circulation credit theory, the critique raised against it by the most influential economists at the time of debate, and an examination of this critique. It is now time to harvest the result of this effort.

It was demonstrated that several of the objections were partly well founded given the use of some problematic terms in the much-debated *Prices and Production* ([1931] 1967), such as the natural rate of interest and the average production period, which have now been clarified with the support of subsequent publications. It was furthermore shown that the three main opponents attacked different theoretical aspects of the circulation credit theory. *John Maynard Keynes* treated the relation between the interest rate, savings and investment. It was found that Keynes' propositions one and two—contesting, on the one hand, that a change in the quantity of money necessarily creates a discrepancy between investment and savings and holding, on the other hand, that a discrepancy might well come about without an increase in the quantity of money—did not rest on arguments that held up to scrutiny. The last proposition, asserting that consumption and investment move in tandem and that the classical theory of the interest rate must be discarded, relies, as we saw, on the assumption that entrepreneurs do not make use of the increased savings, something that Keynes' exposition in the *General Theory* (1936) failed to prove why, *in principle*, must be the case. Thus we cannot grant success to these three propositions, and the arguments that Keynes gave for them, in refuting the circulation credit theory. However, it should be emphasized that Hayek's and Keynes' different descriptions of the economy may be more complementary than was realized in 1931. It might be that Hayek's and Mises' analysis provides theoretical underpinning to the Keynesian framework of "animal spirits,"<sup>44</sup> "liquidity preference" and unemployment equilibrium. The question that Keynes never pursued, viz. *why* the animal spirits would wane systematically *at the same time in the whole economy*, could be answered by Mises' and Hayek's circulation credit theory. Furthermore, Hayek's demonstration of how the fractional banking system as a whole was able to build a pyramid of additional credit on each new deposit and how this mechanism would have to be *reversed* if deposits were withdrawn, gives analytical leg to why an increased preference for holding cash could have such great ramifications for the economy as Keynes observed.

Moving to the second critic, *Piero Sraffa's* acrimonious review and triumphant rejoinder probably influenced many contemporaries in regarding Hayek's argument as flawed. But on closer look, Sraffa's arguments fail to refute any essential parts of the circulation credit theory. His critique scrutinized the two concepts neutrality of money and the natural interest rate, finding them both untenable. But while Sraffa launched a successful attack on the concept of the natural rate of interest in a changing economy, he was mistaken in attributing it as part of Hayek's theory. Neither did Sraffa succeed in showing *why* Hayek's methodological choice of starting in general equilibrium theory, *i.e.* with neutral money, would be an impermissible one given the analysis Hayek set out to conduct. Lastly, *Frank Knight* questioned important aspects of the capital theory upon which the circulation credit theory is

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<sup>44</sup> The human "animal spirits" are the—in Keynes' opinion presumably adequate?—explanation in the *General Theory* (1936, p. 104) for the reoccurring phenomenon of a collective turning of business optimism into business pessimism. He states that "there is the instability due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation [...]. Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die;—though fears of loss may have a basis no more reasonable than hopes of profit had before." This is of course hard to contest; humans are indeed full of both hopes and fears and are far from calculative machines. But to state capriciousness of human nature is not an explanation as to why there would sometimes *systematically* occur business errors throughout the economy.

built and contested the theory of interest developed and employed by Mises. But the arguments against the period of production and increased quantity of capital lengthening the investment structure, propositions one and two, did not pass the test of scrutiny. Furthermore, while the issue of divergent theories of interest was not dived into here, it was argued that it is not clear that this is an issue necessary to settle in order to be able to judge the validity of the circulation credit theory.

In conclusion, having embarked upon inquiry into the propositions and arguments of the opponents to the circulation credit theory, it can be stated that, out of the selection of critique reviewed here, none of the arguments raised with the alleged aim of refuting the circulation credit theory succeeded in this endeavor, since none of the arguments fulfilled both criteria established for refutation. Therefore, *notwithstanding all that has been said against it here, the substance of the theory remains untouched*. This may serve as a reminder that science must always be prepared to question its own results, perhaps macroeconomics more than any other subjects given its residency in a sphere intimately connected with economic politics and politic philosophy, why it must be open to reasonable doubt whether the evolution of macroeconomic thinking is in every instance guided by nothing else than purely scientific criteria.

It should be made clear, however, that the question of the circulation credit theory's validity has *not* been settled here. What *has* been settled is only that the main arguments employed by Keynes, Sraffa and Knight did not successfully refute the theory, and that, perhaps, the theory was unfoundedly discarded by mainstream economics. Thus the theory deserves renewed attention. Furthermore, regardless of the outcome of future discussion, we are not necessarily faced with accepting the theory with hook, line and sinker or discarding it entirely. Any theoretician, regardless of judgment of the theory as a whole, might find usefulness in analytical tools employed by Mises and Hayek that are currently absent in macroeconomic theory, the most evident example being the concept of an investment structure, or capital structure. However, the greatest question for economic theory actuated by the work of Mises and Hayek is in what respect the interest rate needs to be allowed the role of a signal in order to efficiently allocate resources, and whether this is at all compatible with the role of a policy tool. Given the situation today with remarkably low interest rates as a deliberate policy of central banks, Hayek's remark in 1929 (1933, p. 23, emphasis added) seems as relevant today as it was at the time it was made: "[t]he opponents of the stabilization programme still labour—and probably always will labour—under the disadvantage that they have no equally simple and clear-cut rule to propose; perhaps no rule at all which will satisfy the eagerness of those who hope to cure all evils by authoritative action. But whatever may be our hope for the future, the one thing of which we must be painfully aware at the present time—a fact which no writer on these problems should fail to impress upon his reader—is *how little we really know of the forces which we are trying to influence by deliberate management; so little indeed that it must remain an open question whether we would try if we knew more.*"

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