

AN ANALYSIS ON THE RELATIONSHIP BETWEEN HOARDING, INVESTMENT AND ECONOMIC GROWTH

ALEXANDRU PĂTRUȚI

ABSTRACT: The relationship between investment, hoarding and economic growth is a rather complex one. Although both investment and monetary hoarding can be considered different instances of capital accumulation in the long run, their short term effects on economic growth can diverge. These transitory variations are based precisely on the fact that money has a driving force of its own, *i.e.* it is not neutral. I argue that hoarding necessarily implies a longer period of time between the moment when resources are saved and the moment when new consumer goods reach the market (economic growth), as opposed to the case in which the same amount of resources would be invested through the banking system.

KEYWORDS: capital theory, gross market rate of interest, structure of production, investment, economic growth, hoarding

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Alexandru Pătruți (alexandru.patruti@rei.ase.ro) is assistant professor in the Department of International Business and Economics at the Bucharest University of Economic Studies, Romania.

INTRODUCTION

Economic growth is the declared goal of virtually every policymaker in the world. From a pragmatic point of view, one can argue that the main purpose of political economy is to prescribe public policies which generate prosperity (Fetter, 1928). It is beyond the scope of the present article to systematically analyze all the determinants of economic growth. I will focus instead on the relationship between capital accumulation and economic growth, in the attempt to link any increase in a country's welfare to a previous increase in its stock of capital goods. However, in a monetary economy, capital can be accumulated in more ways than in a simple barter economy. The general medium of exchange grants people the possibility to accumulate resources simply by adding to their personal cash balances—an economic process which is usually referred to as *hoarding*.

It is thus the fact that money has a driving force of its own—*i.e.*, it is not neutral in the short run—that offers the foundation for the present study. I argue that increasing a society's cash balances will generate economic growth, but at a later date as compared to the situation in which the same amount of money would be directly invested. This can be proven in an *a priori* fashion by resorting to *capital theory* and using the method of *comparative statics*.

Output growth will lag behind its potential rate in the short run if people increase their cash balances because of the inability of factors' costs, especially the market rate of interest, to rapidly adjust to the variations in the demand for money. Using an organized market for saving (*e.g.* the financial market) could probably offer additional benefits in terms of speed. Thus, although *hoarding is a growth-promoting tool in the long run*, it is probably not the optimal one due to lagged adjustment in interest rates.

LITERATURE REVIEW ON HOARDING AND ECONOMIC GROWTH

As an economist, I hold that capital accumulation is the *fundamental* cause (or determinant) of economic growth.¹ This is by no

¹ It would probably be over-simplistic to say that total production is a function of capital and labor, as the familiar Cobb-Douglas function pictures it (Cobb and

means equal to saying that it is the *only* cause. One can coherently argue that there are at least three determinants of economic growth (Hülsmann, 2011): (1) *capital accumulation*; (2) *an increase in the division of labor*; and (3) *technological innovation*. The present article is a *ceteris paribus* analysis of economic growth, which assumes technological progress and the level of specialization (i.e. division of labor) to be constant. This idea of linking capital accumulation to economic growth is a rather common one. The history of economic thought teaches us that it goes as far back as Adam Smith's *Wealth of Nations* (2007 [1776], p. 213), in which the author writes that: "...the accumulation of stock is previously necessary for carrying on this great improvement in the productive powers of labour, so that accumulation naturally leads to this improvement." However, it was not until the writings of Eugen von Böhm-Bawerk (1890, 1930) that capital theory became a self-standing branch of political economy, having a distinct and systematic set of economic principles. Later, capital theory came to be associated with the so called Austrian school of economics, flourishing in the works of Hayek (1936, 2008 [1931], 2009 [1941]), Mises (1998 [1949]), Strigl (1934) and Rothbard (2009 [1962]).²

The phenomenon of hoarding, on the other hand, was less noticeable in the history of economic thought. It took the forefront of economic disputes for a short while in the famous debate between Keynes and Hayek in the 1930s. Briefly put, in 1932 J. M. Keynes, A. C. Pigou and four other economists drafted and

Douglas, 1927). Although we cannot determine a numerical relationship between the two variables, it seems clear there is a direct link between capital accumulation and economic growth.

² Two extremely interesting exceptions here would be J. A. Schumpeter and Carl Menger. Schumpeter (1934) differentiated himself from the "main body" of the Austrian school by focusing on technological innovation (and not capital accumulation!) as the main determinant of economic growth. Although he does mention that there is a strong link between credit and growth, "savings" as such do not play a significant role in promoting innovation, which is the Schumpeterian driving force of economic development (Croitoru, 2012, pp. 142–143). Carl Menger is the other notable member of the Austrian school who does not endorse Böhm-Bawerkian capital theory (Hayek, 2009 [1941], p. 46). In a comment made to Schumpeter by Menger, the latter points out that "...time will come when people will realise that Böhm-Bawerk's theory [of capital and interest] is one of the greatest errors ever committed" (Endres, 1987, p. 291). This was the case mainly because Böhm-Bawerk's approach towards the capitalist production process was much more objectivist/materialistic than that of his master (Endres, 1987).

cosigned a letter in which they discouraged savings and advocated public spending in order to fill the gap caused by the “reluctant” private sector. The letter was published by *The Times* and became what was later known as “the paradox of thrift.”³ A response letter written by F. A. Hayek, Lionel Robbins, T. A. Gregory and Arnold Plant was published only two days later in the same newspaper (Leeson, 2014, pp. 90–91). The famous LSE economists argued that although the deflationary perils of hoarding are well known since the writings of the classics, it would be a disaster for the economy if the public would stop saving through deposits in banks or securities (*ibidem*). After Keynesian economics became the mainstream theory, hoarding generally became classified as an antisocial and detrimental economic habit. The desire to hold cash at hand, which is in Keynesian terms determined by people’s *liquidity preference* (Keynes, 1936), was considered to be a process which drags the economy backwards. Nearly all policymakers today embrace the Keynesian paradigm of trying to boost aggregate demand through increased consumption in order to generate growth.

Interestingly enough, scattered theoretical insights related to this particular subject can be found in the discussions around the *doctrine of forced savings*. This should not come as a surprise, since the two topics are connected. The forced savings doctrine largely analyzes a classical case in which the producers benefit in the short run from an increase in the quantity of money to the detriment of fixed income earners (Ahiakpor, 2009). Thus, it represents an analysis on how a general increase in prices gives producers a surplus purchasing power in the short run, because of the lagged adjustment of producers’ costs (wages, rent and interest). Entrepreneurs can use their increased real earnings to lengthen the structure of production and boost economic growth. The present article, on the other hand, studies a reverse situation. The goal is to demonstrate that hoarding (i.e. an increase in monetary capital accumulation) is a rather suboptimal *growth promoting tool*, because of the short run lagged adjustment of the market rate of interest.

I argue that Hayek (2008 [1931], pp. 131–187), in particular, and the Austrian school (De Soto, 2006; Rothbard, 2009 [1962]), in

³ For a detailed analysis of the “paradox of thrift” see Hayek (2008 [1931], pp. 131–189).

general, have given abundant arguments as to why consumption cannot increase prosperity by itself. However, there seems to be a lack of economic literature which comparatively analyzes whether in a monetary economy hoarding is in any way different from investment with regards to economic growth. There are of course some notable exceptions, two of which, in my opinion, give us a glimpse of the possible attitudes one can adopt towards hoarding.⁴

The first type of attitude towards this issue is revealed to us by Eugen von Böhm-Bawerk (1930, pp. 115–116) in “The Positive Theory of Capital”:

“[...] an economically advanced people does not hoard, but puts out what it saves—in the purchase of valuable paper, in deposits in a bank or savings-bank, in loan securities, etc. In these ways the amount saved becomes part of productive credit; it increases the purchasing power of producers for productive purposes; it is thus the cause of an extra demand for means of production or intermediate products; and this, in the last resort, induces those who have the regulation of undertakings to invest the productive powers at their disposal in these intermediate products.”

It becomes clear from this quotation that according to Böhm-Bawerk, economic progress stems from the ability of a people to invest their saved resources. By doing so, economizing individuals transfer their excess purchasing power to producers, who can now start longer and more industrious production processes.

Rothbard, on the other hand, takes a somewhat different stand on the issue. He (Rothbard, 2009 [1962], p. 776) states that:

“[Hoarding] is simply an increase in the demand for money, and the result of this change in valuations is that people get what they desire, i.e., an increase in the real value of their cash balances and of the monetary unit.[...] No other significant economic relation—real income, capital structure, etc.—need be changed at all.”

From this last sentence, the message we seem to get from Rothbard is that hoarding does not have any generalized effect on

⁴ It is worth mentioning that the two conflicting views are present within the same school of thought. In spite of the fact that numerous researchers accuse “Austrians” of being too dogmatic, one can easily show that there is wide disagreement between its main proponents, even on critical discussion points.

the structure of production, and implicitly, on economic growth. This would mean that the dynamic of the capital structure is not affected by an increase in people's desire to hold cash and that no direct relation can exist between hoarding and economic growth.

I aim to prove in the following passages that one *can* present economic arguments in defense of the first view and against the second. Comparative statics can be used to show that hoarding essentially implies a lengthening of the structure of production in the long run. However, increasing monetary cash balances does not represent the optimal growth promoting tool, because of its short run transitional effects on the configuration of prices.

A SHORT GLOSSARY

Although such a list of terms is usually found at the back of a book, given the high level of dissent among economists concerning the particular notions we are going to use, I find it useful to define them *before* starting the exposition.

The first terms that we should dwell on are *consumption*, *savings* and *hoarding*, and the particular relations between them. At this point in the discussion it has hopefully become clear that I define savings as *non-consumption*. Therefore, savings and consumption are two mutually exclusive notions—*i.e.* a person can either consume a certain quantity of resources or not, in which case he is saving resources.

In a monetary economy savings can take two⁵ main forms, which are *additions to private cash balances* (*i.e.* hoarding) or *investments* (time deposits, buying stocks or bonds, or directly procuring capital goods and starting new production processes on the market).⁶ It is

⁵ It is true that the individual also has a third possible option, namely non-monetary hoarding. This would be the somewhat pathological stashing away of physical goods without a clear goal in mind. However, we consider that this is only a marginal phenomenon and therefore has a negligible impact on an aggregated level.

⁶ The terminology employed here is essentially a Keynesian one. Hayek (2008 [1931], pp. 442, 443) employs the same terms in his *Reflections on the Pure Theory of Money of Mr. J. M. Keynes*:

Clearly recipients of income must make a choice: they may spend on consumption goods or they may refrain from doing so. In Mr. Keynes's

clear that both hoarding and investing are instances when acting man foregoes present consumption, having in mind greater future satisfactions. They have fundamentally the same nature in the sense that they are dependent on people's time preferences, i.e. their willingness to sacrifice present consumption for the prospect of increasing future consumption (Mises, 1998 [1949], pp. 483–490). When people hoard, they normally⁷ withdraw a certain sum of money from their present income, a sum which they would have previously used for consumption purposes, and hold on to it for future use.

Now that we hopefully cleared out all possible confusions around the conceptual relationships between savings, consumption, monetary hoarding and investment, we can move on to the even more complicated, if not impossible, issue of defining *economic growth*. In this article I will follow Hülsmann (2011, pp. 36–37) in defining economic growth as a *systematic increase in the physical output of consumer goods*. I am fully aware of the shortcomings

terminology the latter operation constitutes saving. Insofar as they do save in this sense, they have the further choice between what one would ordinarily call hoarding and investing or, as Mr. Keynes (because he has employed these more familiar terms for other concepts) chooses to call it, between "bank-deposits" and "securities."

However, the careful reader will immediately observe that the analysis is not a Keynesian one. For Keynes a decrease/increase in saving is assumed to be the only independent factor which impinges on a relatively rigid structure of production (Hayek, 2008 [1931], p. 429). The aim of the present article is *precisely* to analyze how the structure of production *adapts* to different monetary stimuli. We agree in this respect with Milton Friedman who points out in an interview that one of the benefits of Keynes' influence on economic theory was the fact that he developed a terminology which proved useful even for those economists who do not agree with his theory (Blaug, 1990, p. 89).

⁷ I say *normally* because, at least theoretically, there is a possibility that hoarding can come from *disinvestment*. But this is, to my mind, a rather improbable outcome. Why would an investor rationally choose to withdraw his investments and keep the cash stocked away for a significant amount of time? This would mean that he would willingly choose to forgo the amount he used to receive as return on his past investment, for no income whatsoever. The only probable reason I can think of for such an action would be the fact that our would-be investor would need to make an imminent payment (i.e. he needs liquidity to buy something else), either for a consumption good, or another investment. In this case, the hoarding he generates is an extremely transitory phenomenon and can be neglected from our analysis.

of the chosen definition. However, we consider that it is almost impossible to define economic growth in monetary terms, because there is no possibility of subtracting the overlapping effects triggered by variations in the purchasing power of the monetary unit over a certain period of time from the underlining effects caused by real forces. Thus, the increase in monetary value of final goods produced in, let us say, a year, is irrelevant since the purchasing power of the monetary unit could have varied in any way because of cash induced variations (i.e. changes in the *supply of or demand for money*).⁸ To my mind, if we are not willing to drop the term of “economic growth” altogether, we must be willing to refer to it in physical terms. It is true on the other hand that we are now facing another serious problem, namely that in a society which is producing nonhomogeneous goods, there can be situations in which the production of some goods has increased, while the production of others has decreased. The economist finds himself in this case in the impossibility of deciding *ex post* whether society has experienced growth or not. Hence, the solution I propose is to refer to economic growth as a *systematic upward trend in the production of nearly all final goods*. If this general tendency exists, we can say that a society has experienced growth.⁹

THE CAUSAL RELATIONSHIPS BETWEEN HOARDING, INVESTMENT AND ECONOMIC GROWTH

Given the fact that we have already defined the economic notions that will be employed in the present analysis, and that we put the discussion into historical context, one can now proceed to the main topic of the article, which is *the study of the causal relationships between hoarding, investment and economic growth*. The way in which I aim to conduct this study is by using comparative static analysis

⁸ For a detailed analysis regarding cash induced and goods induced changes in purchasing power see Ludwig von Mises's *Human Action* (1998 [1949], pp. 419–424).

⁹ I fully concede that it is probably more rigorous from a theoretical point of view to define economic growth as an increase in the overall value in a society. But monetary calculation is the only way value can be gauged in a complex economy, and as I previously explained, variations in the purchasing power of the monetary unit can render this concept almost useless in practice.

applied on two hypothetical scenarios. After showing that both monetary hoarding and investments are growth promoting tools, I will briefly give additional arguments to suggest that hoarding brings about certain short term vagaries which can postpone future economic growth.

The Thesis

I aim to demonstrate that both hoarding and investments lead to a lengthening of the structure of production and consequently to future economic growth *in the long run*. However, I argue that savings through investment does generate additional benefits in terms of speed (*i.e.*, economic growth will be somewhat faster) and that these advantages stem from the impossibility of the price structure to adjust instantaneously to variations in the total demand for money.¹⁰ This is the same thing as saying that both hoarding and investments are growth-promoting tools in the long run, but the latter appears to be the optimal one because of its additional short run positive effects.

It is useful to point out that when I refer to “the long run,” I am merely indicating that there is a *tendency law* involved, in the classical sense of the word. Thus, there is a systematic trend in the economy to push the market towards a certain equilibrium point, even though that point will never be reached in real life.¹¹

Now in order to prove the above mentioned thesis, respectively that both hoarding and investment have the same effects in the long run, but that investment offers increased benefits in terms of speed, a few additional theoretical premises are necessary. Thus, one requires the Hayekian theory of the structure of production,

¹⁰ One would be tempted to use the term “*time lag*” to describe this adjustment process of the price structure from the old equilibrium point to the new equilibrium point. However, this would probably not be the best strategical option because this notion gives an econometric connotation to the phenomenon, which by its specific nature is unquantifiable.

¹¹ For a systematic analysis of tendency laws from the perspective of economic thought, see Blaug (1997, pp. 59–62). For a detailed inquiry of the role of imaginary constructions (including the final equilibrium model) see Mises (1998 [1949], pp. 236–251).

as presented in *Prices and Production* (Hayek, 2008 [1931])¹² and Ludwig von Mises's analysis on the interest rate from *Human Action* (1998 [1949], pp. 538–550).¹³ Aside from these two pieces of theoretical knowledge, all that is needed is to employ the method of comparative static analysis on a hypothetical example which includes two scenarios.

The Two Scenarios

Let us assume a closed economy where, for the purpose of simplification, people have only three options: to consume, to hoard cash or to open time deposits in banks (i.e. consumption, hoarding and investment). Again, for the same purpose let us assume that we are dealing with a 100 percent reserve banking system, where the only available saving products offered by the bank are time deposits, i.e. deposits that carry interest, and once you opened them you cannot withdraw the money until the specific date is due.¹⁴

In this hypothetical economy we can build two scenarios: one in which all the saved resources are invested and one in which part of the saved resources are kept in individual cash balances. The purpose of the exercise is to use capital theory to demonstrate that both scenarios lead to the same result in the long run,¹⁵ but also to gather sufficient arguments to suggest that investment would promote faster growth.

¹² I was tempted to include here also a third reference, namely Böhm-Bawerk's (1930, p. 20) famous thesis that longer production processes are necessarily more productive from a physical point of view. However, this was already included in Hayek's work (2008 [1931], p. 156): "The proposition that savings can only bring about an increase in the volume of production by permitting a greater and more productive 'roundaboutness' in the methods of production has been demonstrated so fully by the classical analysis of Böhm-Bawerk that it does not require further examination."

¹³ According to some sources (Hayek, 2008 [1931], p. 454; Ahiakpor, 2009, p. 167), this type of analysis in which the market rate of interest diverges from the equilibrium rate of interest is originally associated with the Swedish economist Knut Wicksell.

¹⁴ I willingly avoid fractional reserve banking because it allows the possibility of credit expansion, in which case the market rate of interest can virtually deviate permanently from its equilibrium level.

¹⁵ I will argue further in the article that an underlining tendency to push the market to the same equilibrium point is present in both scenarios, but the two "paths" towards this point are rather different.

Scenario One

The first scenario consists in the assumption that equilibrium is reached in our hypothetical society and that people invest—*i.e.* make time deposits of—20 percent of their annual income and use the rest for consumption purposes. Now let us again suppose that (for whatever reasons) the social rate of time preference changes and that people now save 40 percent of their annual income. Society will now move from the previous equilibrium point to a new one, in which the structure of production will be lengthened. Certain additional economic assertions can be made in this case.

First of all, the decrease in the social time preference has caused an increase in savings from 20 to 40 percent of the total income of the society (which in this particular case is equal to investment because we assumed that all the money was deposited in the banks). This means that the *market rate of interest* must decrease, because there are more resources that entrepreneurs can advance. Businessmen are now free to invest in longer production processes since credit is cheaper.¹⁶ By doing this, they increase future economic growth, since longer production processes are necessarily more productive from a physical point of view, as we know from the above cited Böhm-Bawerkian principle. In the theoretical framework we designed, this practically means that there will be an increase in the future production of consumption goods, as a consequence of the present increase in capital stock.

This should all sound rather simple and clear cut to anyone familiar with Austrian capital theory. The only thing I would like to highlight is the role played by banks as financial intermediaries in the whole process. After receiving the new funds, the banks can use them to give productive credit. The only way they can accommodate these credits on the market is, *ceteris paribus*, at a lower rate

¹⁶ They are stimulated to follow this course of action by the variations in the *net present value* of different investment projects. A decrease in the *market rate of interest*, which in this scenario coincides with the *pure rate of interest*, makes longer production process more attractive to investors. They now have the necessary purchasing power to drag resources away from production processes which are closer to final consumers, towards superior stages of productions. For a detailed analysis on the role of the net present value in Austrian economics see Fuller (2013).

of interest. Thus, the interest rate will almost *immediately* drop on the loan market because of the monetary influx.

However, the situation gets more complicated when we introduce a new “disturbing” factor into the picture—monetary hoarding.¹⁷ This will be done in the following scenario.

Scenario Two

The second scenario consists basically in the same economic tendency, *i.e.*, a society which increases its savings from an aggregated level of 20 percent to an aggregated level of 40 percent of total annual income. However, we will now introduce a further assumption, in the sense that the newly saved monetary resources (representing 20 percent of total annual income) will not be invested via the banking system, but hoarded away in people’s homes. The question which arises is whether there is any difference between this situation and the first one.

...and yes, there is. The key is to keep in mind that money has a driving force of its own and that any variation in the supply or demand for money will affect the purchasing power of the monetary unit. But the problems concentrated around the *rate of interest* are even more interesting and they should attract our attention in order to answer the research question.

When referring to interest, one usually has in mind the premium obtained over a principal sum of money which is being lent. This natural occurring phenomenon is nothing else than the *market rate of interest*, *i.e.*, interest on short to medium term loans on the money market (Mises, 1998 [1949]). This is the relevant real life indicator for gauging people’s time preference and thus the one that entrepreneurs use to adjust the structure of production (Strigl, 1934; Mises, 1998 [1949]). We know that a decrease in the rate of interest causes a lengthening of the structure of production and that this will in turn increase future economic growth (Hayek, 2008 [1931]). This is one of the main theses of Austrian capital theory

¹⁷ Again, I am using the term *disturbing factor* not because hoarding is detrimental to the economy, but because it is a temporary variation which superimposes itself over the long term trend.

and one on which the whole argument of the present paper is built. However, in order for this increase in the structure of production to take place in real life, there must be a prior decrease in the *market rate of interest*. But it is exactly this particular reason that differentiates the second scenario from the first. In the short run, the market rate of interest does not drop when people hoard a part of the saved resources. This happens because the newly saved money does not reach the capital market and is thus not transformed into productive credit. Still, this does not mean that hoarding is neutral on the structure of production, as some economists appear to suggest (Rothbard, 2009 [1962], p. 776), for the reasons that I have previously suggested.

Let us go one step further with the analysis. In order to tackle the theoretical problems surrounding the concept of interest, economists (Mises, 1998 [1949], pp. 538–545) break down the market rate of interest in three main components: *the natural rate of interest*, *an entrepreneurial component* and *a purchasing power component*. In our particular case, we are not interested in the second component, the entrepreneurial one, so we will hold it under the *ceteris paribus* clause and further discuss the remaining two elements. The natural rate of interest represents the interest rate that is achieved when a society reaches equilibrium¹⁸ and it depends entirely on the social time preference.

However, there are situations when an underlining equilibrium tendency can be in the short run affected by disturbing causes, to use Blaug's (1997, pp. 51–66) terminology. Some of the most important factors which can cause a divergence of the market rate of interest (MRI) from the pure rate of interest (PRI) in a monetary economy are variations in the relationship between the supply and demand for money. This is the reason why the market rate of interest contains a third element, a purchasing power component which adjusts the short and medium term interest rate to variations in the purchasing power of money. This third component is either

¹⁸ Economists have used a myriad of names to refer to *the equilibrium rate of interest*, including but not limited to: *originary interest* (Mises, 1998 [1949]), *natural rate of interest* (Wicksell, 1989) or *pure rate of interest* (Rothbard, 2009 [1962]). Regardless of the denomination, all terms refer to the same underlining phenomenon, *i.e.* the rate of interest which is formed after all the current tendencies have completely run their course and no further changes in market data occur.

a positive or a negative price premium: if all prices rise, it has a positive value, if all prices fall, its value will become negative. We will see further that this short theoretical discussion will help us answer our research question.

Scenario two is intended to present us with an example of a society in which there will be a short run discrepancy between *the market rate of interest* and *the pure rate of interest*. The former will remain basically the same in the short run, because the extra funds will not pour in directly on the credit market, while the latter will decrease because of the corresponding drop in the social time preference. However, as economists we know that such a situation cannot persist, given that the market has a natural tendency to eliminate such discrepancies. Ludwig von Mises (1998 [1949], pp. 538–539) is extremely eloquent on this particular subject in his economic treatise “*Human action*”:

Changes in the money relation may under certain circumstances first affect the loan market rate of interest on loans, which we may call the gross money (or market) rate of interest. Can such changes in the gross money rate cause the net rate of interest included in it to deviate lastingly from the height which corresponds to the rate of originary interest, i.e., the difference between the valuation of present and future goods? Can events on the loan market partially or totally eliminate originary interest? No economist will hesitate to answer these questions in the negative.

This is the main reason I claimed that hoarding and investment necessarily have the same effect in the long run. The market mechanism has a driving force which assures that resources are allocated in an optimal fashion. No idle resources can exist in the long run. Every time someone decides to spend less money on consumption purposes, there is a corresponding change in the productive forces of society. For every penny saved, there will be, in the long run, an entrepreneur who will marginally alter the structure of production, in the sense of making it more *roundabout*, and thus, more productive.

But we still have not answered our question. As I mentioned before, scenario one and scenario two describe two slightly different paths towards the same equilibrium point. The social time preference is the same in both of them, i.e. they both represent societies in which people increase their savings from 20 percent to

40 percent of the total income. Then how do the saved resources in the form of hoarded cash manifest themselves on the market rate of interest? This is the point where the purchasing power component becomes an extremely useful tool in our analysis.

In scenario one, where all the people keep their saved money in banks, the market rate of interest falls almost immediately in accordance with the change in social time preference. However, in the second scenario, there will be a short run deviation between the MRI and the PRI. This deviation *will be* corrected through the purchasing power component. When people hoard money, the purchasing power of the monetary unit *steadily* increases and the price structure *gradually* changes. However, this is a complicated process through which every price in the economy must be altered, and the adjustment of the MRI through the purchasing power component *will always lag behind the price movements*. This process is described by Mises (1998 [1949], p. 545):

We have shown one reason why the price premium can at best practically deaden, but never eliminate entirely, the repercussions of cash-induced changes in the money relation upon the content of credit transactions. [...] The price premium always lags behind the changes in purchasing power because what generates it is not the change in the supply of money [...], but the—necessarily later occurring—effects of these changes upon the price structure.

Thus, although monetary hoarding is in the long run nothing more than a particular case of capital accumulation, it does generate in the short run something which can be called a “time-efficiency” problem. This is the case because the market rate of interest cannot instantaneously adapt itself to the new situation, and it is exactly this indicator that enters in the entrepreneur’s decision making process. If people increase their monetary holdings for a significant period of time, all prices must gradually adapt *before* the market interest rate can be adjusted through the purchasing power component.

On the other hand, if we recall scenario one, in which all people directly invested (in our particular example all savings were kept in time deposits), the situation was much simpler in the sense that the market rate of interest adapted almost instantaneously and entrepreneurs could reap directly the benefits of increased capital

accumulation. This is the reason for which I claim that although both hoarding and investment are growth promoting tools, the former does necessary bring about short term vagaries in the money relation which relatively delay economic growth.

THE BENEFITS OF AN ORGANIZED MARKET

I consider that the main thesis of the present paper is a rather intuitive one. The theoretical apparatus employed had the sole purpose of elaborating a formal argument in favor of showing that hoarding is a particular form of capital accumulation in the long run. However, monetary hoarding does appear to create a time lag in the short run as opposed to direct investment of the saved resources, lag which is caused by the necessary adjustments of the market rate of interest to the variation in the purchasing power of the monetary unit.

In the present section I will attempt to give *further* reasons why saving *via* banks¹⁹ can offer additional benefits by accelerating economic growth. The previous and rather straightforward argument which I provided was that when all the saved resources go into the banking system, the market rate of interest will adjust almost immediately. Entrepreneurs can benefit in this way from the smaller interest rate faster, which enables them to lengthen the structure of production and accordingly increase future economic growth. The adjustment process will be more intricate if people decide to hoard the same amount of money. In this case, only *after* all the price movements come to a halt (i.e. after all the prices become fully adjusted to the new purchasing power) can the market rate of interest drop, based on the negative purchasing power premium. If this line of argumentation has not yet fully convinced the reader, let us briefly try an additional approach.

Banks can do a better job in terms of speed of adjustment because the banking system is an example of an *organized market*. Organized

¹⁹ Of course, I am referring here to a non-inflationary banking system. If the banks use their fractional reserve privileges to create an artificial credit expansion, the above mentioned speed benefits will unequivocally be overcompensated by the negative consequences of the boom-bust cycle. For a detailed analysis of the negative effects of the business cycle, see the Mises-Hayek theory of economic crises (Mises, 1998 [1949]; Hayek, 2008 [1931]).

markets generally tend to perform better than non-organized ones because they can decrease transaction costs.

This happens since banks are a specialized kind of intermediary. They are wholesalers, *i.e.*, they collect money from numerous scattered individuals and they generally lend to a small number of businessmen. It is a known fact that intermediaries play a beneficial role for society, in the sense that they quickly diminish price gaps, pushing the market towards equilibrium. In a world based on the international division of labor, specialized producers should be more efficient than non-specialized ones. Our analysis here is nothing more than a particular case of Adam Smith's (2007 [1776]) theory of specialization.

It is not the goal of the present paper to elaborate on the theory of the organized market, nor the theory of the wholesaler. However, I do consider that both of them are *prima facie* arguments that add to my previous demonstration, and that they are extremely interesting topics for further research.

CONCLUSIONS

We have shown in the present paper that hoarding is a particular form of capital accumulation, which permits entrepreneurs to lengthen the structure of production and increase future economic growth. However, I argue that hoarding necessarily implies a longer period of time between the moment when resources are saved and the moment when the new consumer goods are brought to the market (*i.e.* economic growth), as opposed to the case in which saved resources would be invested through the banking system (or any other type of direct investment).

The reason for which this happens lies within the specific features of the monetary economy. When people hoard cash, the only way in which entrepreneurs can employ the newly saved productive forces is through an increase in the purchasing power of the monetary unit. But this implies a gradual change in virtually all the prices in an economy, a process which is necessarily time consuming.

On the other hand, by using the banking system to save money, financial intermediaries can almost immediately adapt the market rate of interest and supply businessmen with the necessary

resources to lengthen the structure of production. In this way, the previously discussed time lag is reduced and economic growth will be somewhat faster because the market rate of interest can adjust before the whole price structure. The fact that banks are also producers of specialized services and that the financial market is an organized market are supplementary arguments that add to the present demonstration. They both represent eventual directions for further research.

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