ROTHBARD'S TIME MARKET AND THE DEMAND FOR PRESENT GOODS

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ABSTRACT: This paper defends the Rothbardian theory which states that the proportion of consumption spending relative to investment spending is systematically related to the interest rate through time preference in society, contrary to Hülsmann (2008). After clarifying that a time market transaction is based on two exchanges over time, it illuminates the necessary implications when analyzing the demand for and supply of present goods. Building on this insight, it shows that rather than assuming that the demand for present goods is held constant throughout the analysis, the traditional change in time preference necessarily implies a reconfiguration. As a result, the Rothbardian theory still holds.

KEYWORDS: Austrian macroeconomics, structure of production, time preference, Rothbard, Hülsmann

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I: INTRODUCTION

One of the distinguishing characteristics of the Austrian school throughout the development of modern macroeconomics was its structure of production framework and capital theory. Building on Menger's (2007 [1871]) insights regarding the categorization of goods as "higher order" or "lower order," Böhm-Bawerk (1930 [1889]) presented a structure of production theory based upon the roundaboutness of production processes and recognized time preference as a factor in determining the interest rate and economic growth. Mises (2009 [1912]) used these insights among others to sketch a capital and monetary based business cycle theory and later contributed to the pure-time-preference theory of interest (Mises, 2008 [1949]). Hayek (2008 [1931]) made notable contributions to capital and business cycle theory, including a graphical representation of the structure of production that could show both sustainable and unsustainable growth, which he subsequently attempted to further improve (Hayek, 2012 [1941]). Rothbard (2009 [1962]) synthesized this entire system traceable to Böhm-Bawerk through his "development of a capital and interest theory that integrated the temporal production-structure analysis of Knut Wicksell and [F.A] Hayek with the pure-time-preference theory expounded by Frank A. Fetter and Ludwig von Mises" (Salerno, 2009, p. xxvii). Using the ideas of earlier Austrian theorists as well as adding his own contributions, Rothbard presented the relationship between the interest rate and the proportion between consumption and investment in the clearest and most logically deduced manner as well as the capital-based growth that underlies Austrian macroeconomics.[1]

The basic growth scenario entails a fall in time preference, which is represented by a decrease in consumption spending and an increase in investment spending. The additional investment funds are spent on higher order goods, and increase the number of production stages

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[1] For a more detailed historical overview on capital theory and the structure of production, including the works of Kirzner and Lachmann, see Skousen (2007, pp. 13–130). On the evolution of the pure-time-preference theory of interest, especially with regards to the contributions of Fetter, see Herbener (2011). White (2012) provides an informative discussion on the theoretical framework of Hayek and its relationship with his contemporaries and predecessors. A brief list of more recent works on Austrian capital theory in the above line of thought includes Skousen (2007 [1990]), Huerta de Soto (2006 [1998]), and Garrison (2006 [2001]).

to reflect the lower natural rate of interest. The opposite occurs for an increase in time preferences. Graphically, the change in time preference is generally visualized as a movement in the supply curve along a constant demand curve in the loanable funds market, which implies a similar shift in the overall time market (Skousen, 2007, p. 233; Garrison, 2006, p. 62). This capital-based growth is fundamental to all current Austrian macroeconomics since it provides the basis for the generalizations made about the capital structure and time preference, mainly, that the proportion of present consumption spending to investment (future consumption) spending is systematically related to the interest rate through time preference. In other words, changes in time preferences are embodied in changes in both as "*the time preferences of the individuals on the market determine simultaneously and by themselves both the market equilibrium interest rate and the proportions between consumption and savings (individual and aggregate).*" (Rothbard, 2009, p. 400).

However, Hülsmann (2008) criticizes this "Rothbardian position" and instead states that "*the aggregate proportion of savings to consumption is not systematically related to the interest rate*" (Hülsmann, 2008, pp. 16, 21). Hülsmann challenges the standard Austrian exposition of growth and presents the case for other types of macroeconomic progress exhibited through changes in time preference. Directed towards the above scenario, most of Hülsmann's analysis is based on the accusation that Austrian economic theory neglects the demand side of the time market by always assuming it is held constant and thus unilaterally focuses on the supply side.[2] In Hülsmann's (2011) words, "the conventional Austrian model more or less exclusively focuses on the ramifications of an increase of the *supply* of present goods (more precisely, of savings) on the time structure of production, under the assumption that the *demand* for present goods remains constant" (Hülsmann, 2011, p. 13). Therefore, the Austrian model develops its conclusions prematurely without analyzing all possible changes in time preference.[3] In Hülsmann's framework, allowing the demand

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[2] "This neglect of the demand side of the time market is the basic shortcoming of the conventional [Austrian] theory, as criticized in the present paper" (Hülsmann, 2008, p. 19).

[3] Because most of Hülsmann's critiques are directed towards Rothbard, this paper concentrates on Rothbard's work. This exclusive focus is not meant to imply that

for present goods, such as the pure demand,[4] to independently shift alongside a constant or changing supply of present goods allows him to make the controversial statement that the proportion between consumption and investment is not apodictically related to the interest rate (Hülsmann, 2008, pp. 18–21).

Hülsmann is right in stating that Austrian economics has clearly mentioned very little about the demand side of the time market. When discussing the determination of the interest rate Rothbard (2009, pp. 367–451) analyzes its derivation, but does not explicitly go on much further.[5] Other Austrian literature that discusses the demand side includes Salerno (2001) and Garrison (2006).[6]

Hülsmann presents a strong accusation and a well-developed case that presents serious challenges for current Austrian macroeconomics to deal with. If correct, Austrian macroeconomics and its theories on time preference, the interest rate, the structure of production, and capital-based growth would have to undergo a massive revision.[7] However, Hülsmann is in error when he makes the claim that the demand for present goods is neglected in the standard Austrian analysis and, as a result, his theories concerning the interest rate and the structure of production lead to the wrong conclusions. This paper defends the conventional Rothbardian argument and counters Hülsmann's claims. It accomplishes this by explaining the demand for and supply of present

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Rothbard alone was responsible for the edifice of Austrian capital theory. In addition, it concentrates on Hülsmann (2008) as opposed to Hülsmann (2011) because it deals with topics beyond the scope of this paper and is still a working draft.

[4] This is the demand expressed by the original factors and is explained below in greater detail.

[5] It should be noted that Rothbard built his analysis of the demand for present goods from Böhm-Bawerk (1930 [1889]).

[6] In addition, when the demand for present goods is discussed, it is usually concerned with the demand for loanable funds. For example, while Garrison (1978) references the pure demand for present goods, Garrison (2006) does not, as critiqued by Salerno (2001) but instead analyzes the implications of an increase in the demand for loanable funds by both by the private sector and government (Garrison, 2006, pp. 33–106). The present paper does not discuss Garrison's macroeconomics or the demand for loanable funds and instead focuses on Hülsmann's work.

[7] The reconstruction of Austrian capital theory along these lines is shown in Hülsmann (2011). Méra (2011), although critical of some points of Hülsmann (2008), essentially accepts its main ideas and also presents a new rendition of capital-based growth.

goods in greater depth by showing how a time market exchange spans two transactions. This insight then illuminates the fact that rather than assuming that the demand for present goods is held constant throughout the analysis, the traditional change in time preference always requires a relative shift in demand. As a result, the proportion between consumption and investment is still systematically related to the interest rate.

II: A CLARIFICATION ON THE DEMAND FOR PRESENT GOODS

In order to portray the Austrian theory in detail, space must be first devoted to analyzing the time market of a given Evenly Rotating Economy (ERE), where there is an absence of change and the same exchanges occur over and over again. In this economy the rate of return in all production processes has been equilibrated to the pure, or natural rate of interest. This return is determined by the societal rate of time preference, which is the premium on present goods (money that can be spent on consumption) over future goods (money that is earned from investment). In other words, it is the premium on present consumption over future consumption.

In a typical production process a capitalist buys capital goods from earlier capitalists, pays original factors (land and labor) to work on the goods over time, and sells them in the future to a later capitalist and earns the interest rate return. This process can be described on the time market as one where original factors demand present goods (money) and supply future goods (the monetary value of the product), while capitalists supply present goods to original factors and earlier capitalists and demand future goods when they sell the product to later capitalists.

It is important to understand that the exchanges on the time market are not completed with a single transaction, but instead span two markets at different points in time, namely the earlier market where the factors of production are sold, and the later market where the finished good is sold to a later capitalist. To quote Rothbard (2009, pp. 377–378):

> When capitalists purchase the services of factors of production… they are purchasing a certain amount and value of net produce, discounted

to the *present* value of that produce… The pure capitalist, therefore, in performing a capital-advancing function in the productive system, plays a sort of intermediary role. He sells money (a present good) to factor-owners in exchange for the services of their factors (prospective future goods). He holds these goods and continues to hire work on them until they have been transformed into consumers' goods (present goods), which are then sold to the public for money (a present good). The premium that he earns from the sale of present goods, compared to what he paid for the future goods, is the *rate of interest* earned on the exchange.

To elaborate, the present good (money) is exchanged in the factor market when the capitalist hires the factors, while the future good (money) is earned after the production process has occurred when the capitalist sells the product. While the original factors are only physically involved in one market, the capitalists are present in both markets. Rothbard (2009, p. 409) drives this point home when he states that

> [the capitalists'] activities as suppliers of present goods in exchange for interest return, therefore, are not really completed with their purchase of factors. Obviously, they could not be. The capitalists must transform the factors into products and sell their products for money before they obtain their interest return from their supply of present goods. The suppliers of future goods (landowners and laborers) *complete* their transactions immediately, as soon as they obtain present money. But the capitalists' transactions are incomplete until they obtain present money once again… for we must look at both of their exchanges, which are necessarily considered together if we consider their *complete* transaction.[8]

Thus a single time market transaction spans multiple exchanges, with individuals on both sides of the market buying and selling money at *different points in time*. This is emphasized by Rothbard (2009, pp. 383, 388–389, 392–395) when he discusses the aggregate time market and describes the supply of present money as the demand for future money, and the demand for present money as the supply of future money. Both of these exchanges *have* to be included because the "price" on this time market is not simply

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[8] In the second to last sentence, Rothbard is not saying that the supply of future goods is irrelevant to their present demand, but that they are no longer involved in the production process, while the capitalist must recoup his savings by selling the good in the future, as the capitalist plays an intermediary role. On the other hand, the borrower of a consumer loan must physically exchange future money with the capitalist (Rothbard, 2009, p. 417).

the cost of buying inputs or the price of the finished good, but rather the differential or *premium* between the two money sums in both exchanges, which the "[factor owners] voluntarily pay in the form of the interest rate" (Rothbard, 2009, p. 374). In other words, the interest rate is equal to the rate of price spread across the ERE (Rothbard, 2009, p. 371). Therefore, just as discussing how the supply of present goods is linked with the demand for future goods, a discussion about the demand for present goods *must* take into consideration the supply of future goods.

The money that the original factors and capitalists selling goods are able to demand is based on what future capitalists believe they can earn, who are compensated due to time preference. The future goods supplied to the later capitalists is their input to the revenue earned from the produced good that is sold in the future, also known as their marginal value product (MVP),[9] while the present goods earned is their discounted marginal value product (DMVP). Rothbard clearly explains this when he writes

> Suppose, for example, that a capitalist-entrepreneur hires labor services, and suppose that it can be determined that this amount of labor service will result in a net revenue of 20 gold ounces to the product-owner. We shall see below that the service will tend to be paid the net value of its product; but it will earn its product *discounted* by the time interval until sale (Rothbard, 2009, p. 377).

And in greater detail when he elaborates on factor pricing:

> The *marginal value product* is the monetary revenue that may be attributed, or "imputed," to one service unit of the factor…. This MVP (marginal value product) is *discounted* by the social rate of time preference, i.e., by the going rate of interest. Suppose, for example, that a unit of a factor… will, imputably, produce for the firm a product one year from now that will be sold for 20 gold ounces. The MVP of this factor is 20 ounces. But this is a future good. The *present value of the future good*, and it is this present value that is *now* being purchased, will be equal to the MVP discounted by the going rate of interest (Rothbard, 2009, p. 456).

Since, as explained earlier, the original factors demand present goods and *also* supply future goods, the pure demand for present

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[9] In the case of the capitalists' demand, it is the capital good's MVP.

goods on the time market must describe both the markets where the factor is bought and where the finished good is sold. Rothbard (2009, pp. 404–406) describes the demand schedule for present goods by the original factors below:

> The pure demanders of present goods on the time market are the various groups of laborers and landowners—the sellers of the services of original productive factors. Their price on the market, as will be seen below, will be set equal to the *marginal value product* of their units, *discounted* by the prevailing rate of interest. The greater the rate of interest, the less will the price of their service be, or rather, the greater will be the *discount* from their marginal value product considered as the matured present good…. A higher rate of interest would lead to a lower price, and a lower rate to a higher price…. It seems likely that the demand schedule for present goods by the original productive factors will be highly inelastic in response to changes in the interest rate. With the large base amount, the discounting by various rates of interest will very likely make little difference to the factor-owner…. Land is very likely to have *no* reservation price, i.e., it will have little subjective-use-value to the owner…. Labor services are also likely to be inelastic with respect to the interest discount.

It is important to note that since the aggregate supply curves for the original factors are likely to be inelastic, the pure demand for present goods on the time market is also relatively inelastic.[10] Equally crucial is that the demand for present goods on the time market is *not* simply the supply curves for particular factors transposed on the time market, but rather the intersection of the supply curve with its DMVP schedule at each hypothetical rate of interest. This is because as repeated in the above analysis, the original factors on the time market do not only demand present money (their DMVP) but *also* supply future money (their MVP). Two exchanges at different points in time are always required for a time market transaction. This point is shown by juxtaposing a part of a demand schedule for present goods on the time market with a part of a supply schedule for a factor (such as labor):

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[10] In addition, since the supply curves for capital goods are inelastic, the capitalist demand for present goods is also relatively inelastic (Rothbard, 2009, p. 406). However, since the demand for consumers' loans is likely to be more elastic, changes in the quantity demanded along the aggregate demand for present goods are mainly shown in the consumption demand schedule (Rothbard, 2009, p. 419).

Table 1. Demand for Present Goods Compared with Supply of Labor

Demand for Present Goods Schedule	Supply of Labor Schedule
10 ounces present money (DMVP) demanded	10 ounces present money demanded
>	>
11 ounces future money (MVP) supplied	1 hour of labor work supplied

It is apparent that the two are not the same. The supply schedule counterbalances units of present money and labor hours, while the demand schedule weighs present money (the factor's DMVP) versus future money (the factor's MVP), due to the nature of a time market exchange. In other words, the pre-income demand for present money on the time market is not the same as the pre-income exchange demand for money in the money relation, even though they both refer to an actor working for a money income (Rothbard, 2009, pp. 414–416, 757).

In the real world of uncertainty, the demand for present goods is not exactly as portrayed. This is because the MVP and hence DMVP of a factor are not given to the capitalist but instead must be estimated through entrepreneurial appraisement (Rothbard, 2009, p. 510). When investing in a production process, the capitalist-entrepreneur always tries to gauge the marketplace for the potential revenue that can be earned from employing certain factors. These are then discounted using an estimated interest rate and serve as the maximum buying prices for the capitalist-entrepreneur. When purchasing factors, the capitalist-entrepreneur tries to pay them less than their DMVPs in order to reap a profit (a return greater than the rate of interest) if he has correctly estimated their MVPs. In other cases, the capitalist-entrepreneur overestimates their MVPs and ends up overpaying the factors according to their true DMVPs and suffers a loss (a return less than the rate of interest). Since the capitalist-entrepreneur may end up overpaying or underpaying factors, a particular quantity demanded of present goods by a factor will be greater than or less than their true DMVP and the above demand schedule will not generally hold in the real world. However, the demand for present goods is still

dependent on two exchanges over time, only now that demand occurs in a world of uncertainty, entrepreneurial appraisement, and profit and loss (Rothbard, 2009, pp. 509–516).[11]

The fact that the time market spans over multiple exchanges provides a crucial insight on both the demand and supply of present goods, namely that one must consider the demand and supply of future goods as well. It is shown below that this is fundamental to the analysis of describing how the demand for present goods is utilized during a change in time preferences.

III: AN ELUCIDATION OF TRADITIONAL CAPITAL-BASED MACROECONOMICS

The above clarification allows one to better understand the production structure of a given ERE and ultimately changes in time preferences. Returning to the "typical production process" described earlier, the entire production structure is a cumulative series of these processes, or stages, with the first stage beginning when capitalists exclusively spend money on original factors and the last stage occurring when capitalists instead sell their finished product to consumers. An entire "round," or period of exchanges in a given ERE spans a time length long enough until all capital goods resolve into being made solely by original factors, i.e., the length of time it takes from the first to the last stage. In this period total investment is the amount of present goods supplied by capitalists, while total consumption is the amount of money spent on finished products. Since there is no hoarding or dishoarding in this economy, gross expenditure in any given round is equal to gross income in the subsequent round.

In Rothbard's example, the ERE's round spans a time length of six years, with each stage taking approximately one year (Rothbard, 2009, p. 368). Rothbard breaks down the flow of money and income in his presented production structure, and the remainder of the paper refers to his numbers. Figure 1 presents his hypothetical production structure:

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[11] Differences in the rates of return brought about by profits and losses are equilibrated in the long run through the entrepreneurial appraisement process into the uniform natural rate of interest.

Figure 1. Hypothetical ERE (Murphy, 2006, p. 97)[12]

Income to Land and Labor Factors, 83 Ounces							
Interest Income 17 Ounces	↑ 19 Ounces	↑	↑	↑	↑	↑	
		↑					
1	← 20	8	↑				Capitalists: N
2	← 30		13	↑			5
2	← 45			12	↑		4
3	← 60				16	↑	3
4	← 80					15	2
5	← 100 Ounces						1

In this ERE, 100 ounces are spent on consumption and 318 are spent on investment spread out over six stages at a roughly 5 percent rate of interest, for a total of 418 ounces of gross expenditure. In order to fully elaborate on this economy it is necessary to trace out the money spent in both "sides" of the economy; i.e. consumption and investment.

The gross income from investment is neatly broken down by Rothbard in Table 2:

Table 2. Income from Investment (Rothbard, 2009, p. 395)

(Savers) Suppliers of Present Goods	Demanders of Present Goods Suppliers of Future Goods	
Capitalists$_1$… 95 oz. →	15 oz. Land and Labor Owners; Capitalists$_2$… 80 oz.	
Capitalists$_2$… 76 oz. →	16 oz. Land and Labor Owners; Capitalists$_3$… 60 oz.	
Capitalists$_3$… 57 oz. →	12 oz. Land and Labor Owners; Capitalists$_4$… 45 oz.	
Capitalists$_4$… 43 oz. →	13 oz. Land and Labor Owners; Capitalists$_5$… 30 oz.	
Capitalists$_5$… 28 oz. →	8 oz. Land and Labor Owners; Capitalists$_N$… 20 oz.	
Capitalists$_N$… 19 oz. →	19 oz. Land and Labor Owners ……………	
318 oz.	83 oz.	235 oz.

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[12] A similar figure is presented in Rothbard (2009, p. 369). The only revision here to the Murphy figure is the labeling of the particular capitalists in each row. In Tables 2 and 3 presented below, Rothbard designated the 6th capitalists as the Nth, so in keeping with his Tables the 6th capitalists are presented as such.

All of the money saved by capitalists$_{1-N}$ (318) is spent on either original factors (83) or capitalists from the prior stage (235). As original factor income does not require further deductions, from savings the original factors earn a net income of 83 ounces. However, the net income of capitalists$_{2-6}$ (12) is their total gross income from later capitalists minus the money they must pay out, as reflected in the following Table 3:

Table 3. Net Incomes of Capitalists Producing Capital Goods (Rothbard, 2009, p. 396)

Capitalists$_2$	80 - 76 = 4 oz.
Capitalists$_3$	60 - 57 = 3 oz.
Capitalists$_4$	45 - 43 = 2 oz.
Capitalists$_5$	30 - 28 = 2 oz.
Capitalists$_N$	20 - 19 = 1 oz.
	12 oz.

The money spent on consumption (100) provides both the gross and net income of Capitalist$_1$ (5). As Rothbard (2009, p. 369) explains, this money then passes through each production stage and is divided amongst the net income of Capitalists$_{1-N}$ (17) and the original factors (83). In any ERE the total amount of consumption spending must always equate to total net income.

Following Figure 1 and Table 2, the components making up the Total time market, i.e., the original factors and capitalists, can be constructed using Rothbard's numbers. The first is the aggregate of all the original factor time markets. The second shows the aggregate capitalist demand for present goods. The last market is the summation of the other two.[13]

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[13] Rothbard never formally depicted the time market diagram in this manner, although he did draw the Total time market diagram for any given economy (Rothbard, 2009, pp. 388, 418).

Figure 2. Time Markets for Hypothetical ERE
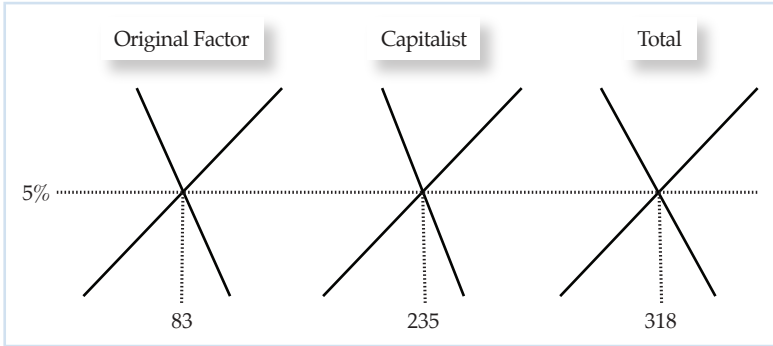
At this time it is now possible to fully portray a change in time preferences and show the relative changes in the demand for present goods. This paper uses the scenario provided by Rothbard (2009, pp. 518–519), who postulates a fall in consumption spending by 20 ounces and a rise in investment spending by 20 ounces. Since Rothbard does not numerically show the new structure of production, the numbers for the new ERE are taken from Murphy (2006, p. 97). In this scenario, the number of production stages increases to 7 and the interest rate falls to roughly 3 percent. The new structure is depicted below:

Figure 3. Hypothetical ERE Following a Fall in Time Preferences

Income to Land and Labor Factors, 69.9 Ounces							
Interest Income 10.1 Ounces	↑ ↑ 17 Ounces	↑	↑	↑	↑	↑	↑
0.5	← 17.5	10	↑				
0.8	← 28.3		10	↑			
1.1	← 39.4			10	↑		
1.5	← 50.9				11.3	↑	
1.9	← 64.1					1.6	↑
2.0	← 67.7						10
2.3	← 80 Ounces						

As stated before, the traditional Austrian portrayal of capital-based growth is exerted through a fall in time preference via a decrease in consumption and a rise in investment. This translates into a lower premium on present goods over future goods and ultimately a smaller price spread and lengthier structure of production.[14]

At this point it is now necessary to describe how this reconfigures the demand for present goods. It is first shown by analyzing the changes provoked by consumption spending and investment spending. During this, the relative changes between the higher and lower stages are considered and then finally the relative changes between the original factors and capitalists.

According to the Law of Imputation, which states that the value accorded to a factor of production is caused solely by the value placed on the consumer good it produces, the values of all factors of production are strictly derivative of what consumers are willing to pay. Since value is imputed backwards to the factors and not forwards, all of the MVPs, or future goods supplied, are intricately related to consumption spending. Consumption spending is intertwined with the future money that the capitalists and original factors supply at each stage and thus the total amount of future goods supplied throughout the production structure (Rothbard, 2009, pp. 369, 480). Consequently, both relative and absolute changes in consumption alter the demand schedules for present goods across the production structure.

 At this moment the analysis focuses now on the present goods demanded in the higher and lower stages of the economy and not the distribution between the original factors and capitalists. Take, for example, the simplified demand schedule in Table 1, and suppose that the numbers are changed to reflect the final stage of production shown in Figure 1, where original factors and capital goods earn a combined DMVP of 95 ounces while the final capitalists earn their MVP of 100 ounces. This is row 1 on Table 2, and is explicitly described by Rothbard (2009, p. 392). Before the decrease in consumption, it was:

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[14] Due to space constraints, the defense of other economic processes involved, such as the lengthening of the structure of production, are not discussed here. They are assumed to hold true in this scenario.

Table 4. Demand for Present Goods in First Stage

95 ounces present money demanded by O.F. and Capitalists$_2$
>
100 ounces future money supplied to Capitalists$_1$

However, now that consumption declined from 100 to 80, the supply of future money must necessarily decline, which raises the relative ranking of future money on the schedule. Capitalists$_1$, faced with lower MVPs for their factors, revise the DMVP schedules downward for the factors in the first stage and thereby invest less in them. This process continues as the fall in consumption spending sends "an impetus towards declining money incomes and prices… along the production structure" (Rothbard, 2009, p. 518), which changes the relative rankings of future goods and present goods at each stage as the MVPs and DMVPs of factors fall.

On the other hand, the increase in investment from 318 to 338 raises the overall prices (DMVPs) of factors in the higher stages of production. These prices increase because the prices of the capital goods they make (their MVPs) have increased. The opposite phenomenon of what was described above, namely a relative fall in the rankings of future money supplied to the capitalists, occurs in these stages. Thus the price spread in the economy pivots as the relative demands for present goods fall in the lower orders while they rise in the higher orders. To quote Rothbard (2009, pp. 521–522):

> Let us consider the price changes in the various stages and the processes by which they occur. In the lower stages, prices fall because of the lower consumer demand and the resulting shift of investment capital from the stages nearest consumption. In the higher stages, on the other hand, demand for factors increases under the impact of the new savings and the shift in investment from the lower levels. The increased investment expenditure in the higher levels raises the prices for the factors in these stages. It is as if the impact of the lower consumer demand tends to die out in the higher stages and is more and more counteracted by the increase and shift in investment funds.

Now it is appropriate to describe the relative changes in present goods and future goods between the original factors and capitalists in the aggregate.

The decrease in consumption leads to a smaller "consumption fund" that finances interest and original factor income.[15] With a decrease in consumption, this net income fund always declines (Rothbard, 2009, p. 524). What happens to both original factor and interest income individually is impossible to say. Since interest income is gross investment times the interest rate, total net income accruing to capitalists may increase or decrease depending on the relative alteration in the interest rate and changes in investment spending. For this analysis, following Rothbard (2009, p. 524) and Murphy (2006, pp. 96–98), this paper assumes both original factor (83 to 70) and interest (17 to 10) income fall.

Thus, while some demand schedules for present goods by certain original factors increase in the higher stages from the rise in investment, with the fall in consumption spending there is a decrease in the total demand for present goods by the original factors. This means that while some original factors may command higher prices, particularly in the higher stages, as Rothbard (2009, p. 524) puts it, the prices of original factors decline "in general." In other words, the total MVPs of the original factors are now smaller, and therefore the total DMVPs are as well.

By itself, Rothbard's analysis here provides evidence that he did not neglect changes on the demand side of the time market. If original factor income (generally) falls, *how else can the quantity of present goods demanded by them and the interest rate decrease without a change on the demand side?* Basic price theory explains that for a decrease in both price and quantity to occur, the change must come from the demand side. Illustrations showing only a shift in the supply curve would lead to the conclusion that original factor income always increases during a lowering of time preferences and a fall in the interest rate, which is not true. Also notice that the aggregate change in the pure demand for present goods is not caused by any change in the aggregate supplies of factors, as they have been held constant in the analysis (Rothbard, 2009, p. 524).

On the other hand, the savings that would have gone to the original factors (13) and the increase in investment spending (20)

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[15] This is not meant to imply that consumption spending drives economic activity or that a certain amount of consumption spending is needed in order to keep the production structure stable (Rothbard, 2009, pp. 397–404).

are instead absorbed into the capitalist time market (235 to 268). Here the demand for present goods increases due to the relative increase in the profitability of producing capital goods, particularly in the higher stages. Once again, while some capitalists decrease their demand for present goods, i.e., those producing capital goods in the lower orders, overall their demand increases.

On the whole then, not only does the relative demand for present goods change between the stages, but also between the two subdivisions of the Total time market. Rothbard clearly explains the relative shift in savings and the demand for present goods when he writes:

> One question that immediately presents itself is: How can the prices of factors decline while the gross income remains the same and gross investment even increases? The answer is that…the increase in gross investment, in particular, raises the prices of capital goods at the highest stages...the larger gross investment fund is absorbed, so to speak, by higher prices of high-order capital goods and by the consequent new stages of turnover of these goods (Rothbard, 2009, pp. 526–527).

Figure 4 presents the updated markets in red:

Figure 4. Time Markets for Hypothetical ERE Following a Fall in Time Preferences
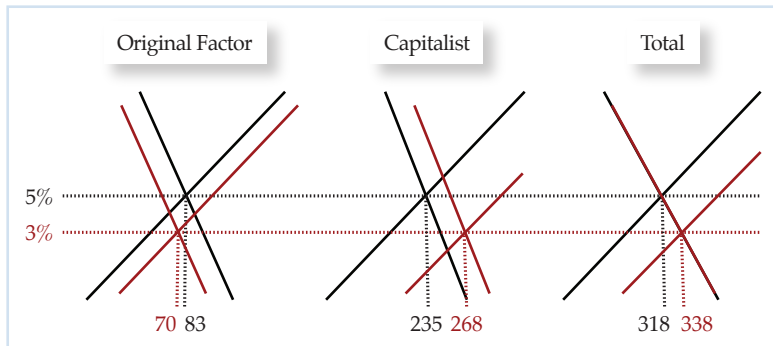
Overall, in the Total market the demand curve remains relatively constant and the supply curve shifts outwards, resulting in a typical illustration of a lowering of time preferences. Although the demand curve appears to have not moved, the composition of the

demand for present goods has undergone a complete revolution as the demand curves for the markets making up the general time market have drastically changed, and the fall in the demand for present goods by the original factors is compensated by the rise in the demand by capitalists.[16, 17]

Thus, while superficially it appears that the demand for present goods is held constant while the supply of present goods increases in the traditional Austrian scenario, in fact a complete reconfiguration of the demand curve occurs.[18] The demand for present goods, as Hülsmann asserts, is not neglected throughout the analysis, but in fact its changes play an integral role in transforming the production structure to reflect the fall in time preferences. *Without such a modification of the demand for present goods the traditional Austrian scenario cannot occur at all.*

It is important to note that in Rothbard's framework, changes in the total demand for present goods are not due to changes in factor supply as described by Hülsmann (2008, p. 19), but rather due to relative changes in spending; in the above case, a decrease in consumption and increase in investment. This creates an entirely different constellation of market prices, and hence future goods supplied and present goods demanded, as the comparative changes in the prices of factors of production increase or decrease depending on where they are located in the production structure. The individual demand schedules for present goods by a given factor of production can change independently depending on a relative change in the particular demand curve for the product they produce or the particular factor's supply curve, but this is

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[16] Clearly, the supply and demand curves shifts will not be as smooth and proportional as shown above; their jaggedness and changing elasticities during the transition produce totally different curves in each market. Furthermore, the intricacies of changes in the supply of present goods are also not shown. The main purpose of Figure 4 is to just illustrate the relative alteration in the demand for present goods.

[17] Bear in mind that the depiction of the changes in the demand for present goods above refers to the new curves in the new ERE. During the transition (i.e., a world of uncertainty and profit and loss), the strictures regarding the demand for present goods in the real world described earlier apply.

[18] Following Rothbard (2009, p. 531), the typical rise in time preference can be portrayed simply by proceeding backwards from the above scenario.

counterbalanced by the schedules for other factors. But a change in the aggregate supply of the original factors, holding the spending patterns constant, cannot change the aggregate demand for present goods in such a way to change the interest rate as it is ultimately linked to the comparative spending between consumption and investment.[19] The error in assuming that it does is linked to the belief that the pure demand for present goods is synonymous with the original factor's supply curve, which is not true.

Thus changes in time preferences are always reflected in the concomitant alteration between the proportion of consumption and investment spending and the interest rate. Lower time preferences are embodied in a fall in the proportion of consumption to investment and the interest rate, while higher time preferences imply the reverse. The proportion represents the degree of spending on present consumption versus future consumption, and the interest rate reflects the premium on present consumption versus future consumption. The independent demand for present goods, as portrayed by Hülsmann, exerts no exogenous influence on the structure of production.

It is imperative to reiterate that ultimately, changes in the aggregate production structure *through capital-based macroeconomics* are systematically determined by consumption and investment spending. Changes in investment spending exert their influence through an increase in the supply of present goods, while changes in consumption spending modify the demand for present goods. A change in time preference is always embodied in the systematic relationship between consumption and investment and the interest rate. Contrary to Hülsmann (2008, pp. 15–16), Rothbard can be quoted approvingly when he states,

> Each individual, on the basis of his time-preference schedule, decides between the amount of his money income to be devoted to saving and the amount to be devoted to consumption. *The aggregate time-market schedules (determined by time preferences) determine the aggregate social proportions between (gross) savings and consumption.* It is clear that the higher the time-preference schedules are, the greater will be the

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[19] Following the above analysis, while the demand curve will strictly not be exactly the same, holding spending patterns constant, then new demand curve will intersect the supply curve at the same rate of interest and quantity of savings.

proportion of consumption to savings; while lower time-preference schedules will lower this proportion. At the same time… higher time-preference schedules in the economy lead to higher rates of interest, and lower schedules lead to lower rates of interest. From this it becomes clear that *the time preferences of the individuals on the market determine simultaneously and by themselves both the market equilibrium interest rate and the proportions between consumption and savings (individual and aggregate).* Both of the latter are the obverse side of the same coin… The important consideration, therefore, is time preferences and the resultant proportion between expenditure of consumers' and producers' goods (investment) (Rothbard, 2009, pp. 400–404).

IV: CONCLUSION

This paper defends the Rothbardian theory relating the proportion between consumption and investment spending with the interest rate from Hülsmann (2008). It explains that a time market exchange spans over two transactions and the resultant consequences for the analysis of the demand for and supply of present goods. It shows that with a change in time preference, there is necessarily a total change in the demand for present goods between the higher and lower stages of production as well as the original factor and capitalist time markets. The above analysis provides a detailed framework that reinforces the systematic relationship between time preference, the capital structure, and the interest rate.

REFERENCES

Böhm Bawerk, Eugen von. 1889. *The Positive Theory of Capital*. New York: G.E. Stechert, 1930.

Garrison, Roger. 1978. "Austrian Macroeconomics: A Diagrammatic Exposition," in *Austrian Economics: New Directions and Unresolved Questions*, ed. Louis M. Spadaro. Kansas City: Sheed, Andrews, and McMeel, Inc.

——. 2001. *Time and Money: The Macroeconomics of the Capital Structure*. New York: Routledge, 2006.

Hayek, Friedrich A. 1931. "Prices and Production." In *Prices & Production and Other Works: On Money, the Business Cycle, and the Gold Standard*, ed. Joseph Salerno. Auburn, Ala.: Ludwig von Mises Institute, 2008.

——. 1941. *The Pure Theory of Capital*, ed. Lawrence H. White. Indianapolis, Ind.: Liberty Fund Inc., 2012.

Herbener, Jeffrey M. 2011. "Introduction," In *The Pure Time-Preference Theory of Interest*, ed. Jeffrey M. Herbener. Auburn, Ala.: Ludwig von Mises Institute.

Huerta de Soto, Jesús. 1998. *Money, Bank Credit, and Economic Cycles*. Auburn, Ala.: Ludwig von Mises Institute, 2006.

Hülsmann, Jorg Guido. 2008. "Time Preference and Investment Expenditure." *Processos de Mercado: Revista Europea de Economia Politica* V (2): 13-33.

——. 2011. "The Structure of Production Reconsidered." *Université d'Angers : GRANEM Working Paper no. 2011-09-034* 1–62.

Menger, Carl. 1871. *Principles of Economics*. Auburn, Ala.: Ludwig von Mises Institute, 2007.

Méra, Xavier. 2011. "'Time Preference and Investment Expenditure:' Comment on Hülsmann." *Processos de Mercado: Revista de Economia Politica* 8, no. 2: 291–304.

Mises, Ludwig von. 1912. *The Theory of Money and Credit*. Auburn, Ala.: Ludwig von Mises Institute, 2009.

——. 1949. *Human Action*. Auburn, Ala.: Ludwig von Mises Institute, 2008.

Murphy, Robert. 2006. *Study Guide to Man, Economy, and State*. Auburn, AL: Ludwig von Mises Institute.

Rothbard, Murray N. 1962. *Man, Economy, and State with Power and Market*. Auburn, Ala.: Ludwig von Mises Institute, 2009.

Salerno, Joseph. 2001. "Does the Concept of Secular Based Growth Have a Place in Modern Macroeconomics?" *Quarterly Journal of Austrian Economics* 4 (3): 43-61.

——. 2009. "Introduction to the Second Edition." In Murray Rothbard, *Man, Economy, and State with Power and Market*. Auburn, Ala.: Ludwig von Mises Institute.

Skousen, Mark. 1990. *The Structure of Production*. New York: New York University Press, 2007.

White, Lawrence H. 2012. "Editor's Introduction," in Friedrich A. Hayek, *The Pure Theory of Capital*, ed. Lawrence H. White. Indianapolis, Ind.: Liberty Fund Inc.