

**“Time is Money”? Banks, Opportunity Cost, Labour,
and Recent European Crises**

*¿“Es dinero el tiempo”? Bancos, coste de oportunidad, trabajo
y crisis europeas recientes*

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ABSTRACT

This paper questions if economic analysis can justify the identification of time as money. To answer it, we search ideas and theories relating both in the history of economic thought, and in the economic literature of the past eighty years. It is not by chance that interest, as theory and as concept, figures successively as coincident result of our two stop search. And it is also the point of departure to expose our answers: the banks as time convertors and money creators; the opportunity cost of the employment of time; and the labour time approach. Finally, we use these three answers to illustrate the trade-off between time and money in the recent European crises.

Keywords: Time, money, banks, labour, crises.

JEL Classification: B00, E40, G01.

RESUMEN

Este artículo se pregunta si el análisis económico puede justificar la identificación del tiempo con el dinero. Para responderla, buscamos ideas o teorías que relacionen a ambos en la historia del pensamiento económico y en la literatura económica de los últimos ochenta años. No es por casualidad que el interés, como teoría y como concepto, aparece sucesivamente como el resultado coincidente de las dos etapas de esta búsqueda. Y también constituye el punto de partida para exponer nuestras respuestas: los bancos como conversores de tiempo y creadores de dinero; el coste de oportunidad del empleo del tiempo; y el enfoque tiempo de trabajo. Finalmente, empleamos dichas respuestas para ilustrar el trade-off entre tiempo y dinero en las recientes crisis europeas.

Palabras clave: Tiempo, dinero, bancos, trabajo, crisis.

Clasificación JEL: B00, E40, G01.



1. INTRODUCTION

REMEMBER that *time* is money. He that can earn ten shillings a day by his labour, and goes abroad, or sits idle one half of that day, though he spends but sixpence during his diversion or idleness, ought not to reckon *that* the only expense; he has really spent, or rather thrown away, five shillings besides.

Remember that *credit* is money. If a man lets his money lie in my hands after it is due, he gives me the interest, or so much as I can make of it during that time. This amounts to a considerable sum where a man has good and large credit, and makes good use of it (Franklin, 1793: 188).

This paper has its origins on the well-known motto “Time is Money”. Interpretations of its possible meanings aside, it is precisely the explicit identification of time as money, which this quote preaches, that makes it especially suitable for consideration as a subject of economic enquiry. This essay questions whether or not this famous Franklin’s quote can be deemed certain from this perspective. Or in other words, if economic analysis can provide reasons to justify the identification of time as money, and to allow us to express one in terms of the other.

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To guide us in the way to answer these questions it seems logical to begin by searching in the field of the history of economic thought, doctrines, theories or analysis relating time with money¹.

2. IN SEARCH OF THEORIES RELATING TIME AND MONEY IN THE HISTORY OF ECONOMIC THOUGHT

We can cover the task alluded above firstly following as a general guiding thread Spiegel’s *History of the Growth of Economic Thought*. This work is clear and rigorous, and as it attends not only to the discovery context as well as the validation one, it is specially indicated for the pretended reconstruction; while as handbook of history’s economic thought constitutes a paradigm of its pedagogical virtues.

The loan bearing interest historically considered is as old as trade itself; and its practice always includes, at least, what is lent, the interest rate and the maturity. Since from its origin money was an object of loan - such important as in kind -, both of them are related since they were intended as subjects in the very early history of economics.

2.1. The loan bearing interest in the ancient and middle ages thought

The practice of loan bearing interest is firstly judged from a religious point of view in the Bible’s *Old Testament* and from an ethical one by the Greek Philosophers.

In the former the loan including interest is explicitly proscribed between Jewish people, as a rule for protecting the weak. In the latter, the practice of loan which includes interest is firstly condemned by Plato, and later by Aristotle.

The reason why Aristotle condemns ethically the loan with interest it is because the lender asks from the borrower to return to him something more than what he has lend - wheat, oil, wool, money, etc.- to him: an unjust time deferred exchange. To him the commutative justice must govern the household's exchanges by the presence of justice in the exchanges, in which none of the two parts should obtain more than the other part; and the price -which is the expression of the value of a good in monetary terms-, must be just. In this author, that condemnation is inseparable from his ideas about money.

As we know, for this author the money in itself does not constitute wealth because, among other reasons, it cannot satisfy in a direct way the life necessities. According to Aristotle, money has several functions: it serves to set the price of things and to facilitate exchange avoiding barter; but he does not consider ethical what we call nowadays the money function as store of value because it is related to the accumulation "per se" of the same, something so unnatural as the usury.

The influence of Aristotle on Scholasticism is inseparable from the teachings of Saint Thomas. Aquinas Christianizes Aristotle's thought, preserving its logic and reconciling it with the *Old* and *New Testament* and the Patristic. In this way he condemns the loan in kind or money terms whenever it incorporates interest or usury; exception done of the cases in which the lender could receive something more than he has lent to the borrower as compensation for the damage done.

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What conclusions could we obtain about the relation between time and money in the usury doctrines of the Ancient and Middle Ages?

The Aristotelian condemnation of the usury practice is made from an ethical point of view considering it unjust; additionally condemned when the subject of loan was money because of the unnatural character of monetary profit pursuing. The relevant question for us, from Aristotle's money analysis, is that he rejects it as store of value, this function relating, more than any one invoked by him, money with time: money as reserve of value allows its accumulation over time. If Aristotle considered money as wealth, the reserve of value as money's function would be justified.

Aquinas doctrine of usury includes exceptions to the prohibition of interest by reason of external circumstances to the loan contract; these exceptions are important because they establish a precedent to introduce future additional circumstances, which justify the payment of compensation for the loan -as for example an indemnity by time passing.

2.2. English mercantilism: Locke's monetary theory and Petty's money ideas

In the XVII century the lawfulness of the payment of interest for a loan was accepted by the civil society; progressively tolerated by theologians and jurists, the debate in religious terms was a matter of discussion reduced to some elements belonging to late scholasticism.

In fact, this century in England is presided by the rate of interest debate in pure mercantilist terms. Beginning with Child's pledge that a fall in the rate of interest will be the best solution for the English commercial crisis of the 1620's was answered by



Manley showing that a low rate of interest is the effect rather than the cause of the wealth of England.

John Locke came in to the discussion -as officious representative of finance minister Sir Ashley Cooper, his friend and protector- elaborating a theory of interest as a monetary theory resulting from a general theory of the price based on the “quantity” (supply) and the “vent” (demand); interest being for him, the price of the money.

His monetary theory is a particular application of his general theory of supply and demand to the particular case of money. In which he considers -to express it in our present economic language-, not only the effects of the variation of the quantity of money (M) on the general price level (P) keeping constant the volume of transactions (T) -the case already studied in the monetary theories of the Spanish theologian Martín de Azpilcueta and the French theoretical of Politics Jean Bodin in the XVI century-, but also the alternative case: the effects of the quantity of money (M) on the volume of transactions (T) keeping prices (P) constant.

The mercantilist identification of wealth with money includes the attempt of estimation of the quantity necessary of money to drive trade.

Petty, the mayor author representative of the quantitative branch of English mercantilism, doing a calculation of the desirable quantity of money relates it with its velocity of circulation (V), which, in turn, is considered as function of the periodicity with which the worker is paid.

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In relation with our research, Mercantilism not only means that interest is considered by the civil authors from a non-religious point of view, but brings also important English contributions to monetary theory. On one hand, Locke analyzes the effects of the quantity of money (M) on the volume of transactions (T) considering the Prices (P) as constant; in the other, Petty takes account of the velocity of circulation of money (V) to calculate the quantity necessary of money to drive trade. This consideration of the velocity of circulation of money is extremely important for us because it relates in theoretical terms money with time.

2. 3. Interest and monetary theories: From Turgot to Keynes

We are going to continue our search of additional relations between the ideas of time and money in the history of economic thought examining in chronological order diverse theories of a list of authors, which begin with Turgot and finish with Keynes. To that end, we will look first of all for the respective interest and monetary theories in each of these authors as the connecting threads, which could lead us to find new links between time and money.

We need to add that we will omit some capital, monetary or interest theories, or parts of them, whether it pertains to the listed authors or to others not mentioned in it, when considered as not useful for our purposes; as for example: Turgot’s and Smith’s capital theories, Ricardo’s monetary theory, the monetary theories of the authors involved in the debate between the Currency and the Banking Schools.

For Turgot interest it is paid as an opportunity cost by reason that if the lender would employ his funds for the land purchase he would obtain some profits, an opportunity to

which he renounces in the moment which he lends his money. Turgot reinforces his argument referring to the property right: the lender is the proprietor of his funds, he could do what he wants with it and nobody has right to pretend its use in exchange for nothing. Interest, in Turgot, measures the abundance or scarcity of the capital. Capital could be only employed in those investments that return as much or more than the rate of interest. The latter could be considered as a kind of level, under which all labour, all agriculture, all industry or all trade, end.

Hume considers that the rate of interest basically reflects the supply and demand of real capital; which, in turn, depend on the habits and the ways of life of the people -showing the importance of the variations of economic institutions throughout history.

Interest, for Smith, is the compensation that the borrower must pay to the lender for the profits that could be obtained when using the money; and tend to vary with the profit.

Malthus breaks with the implicit supposition of Smith of neutral money, which operates only as medium of exchange and not as store of value. Malthus considers money as absolutely necessary to any considerable saving and enumerates different reasons to preserve the money: to defray the expenses of the children, to buy a property or to order or demand labour in the future.

Thornton drew in detail the effect that the variations in the quantity of money produce on the rate of interest and, in consequence, on the prices. Thornton analyzed the monetary expansion resulting from the existing divergence among the rate of interest adopted by the bank and the normal rate of merchant profits. Thornton also distinguished between the real rate of interest and the nominal one.

Menger applies to the money his subjective theory of value: money was not introduced by or as a consequence of a plan, but as an involuntary result of the non-coordinated actions of a multitude of individuals in search of their own interest.

Böhm-Bawerk was one of the most important followers of Menger. His main contributions were his theories of capital and interest and based on them he developed his criticism on socialism. The ideas of Böhm-Bawerk are expounded in *Capital and Interest* (1884) and *Positive Theory of Capital* (1889). The first work is a doctrinal history of the theories of interest, while the second contains his own contributions.

The men, Böhm-Bawerk argued, tend to overestimate the future resources and to underestimate the future needs; on the other hand, the present goods will give in a future other goods of greater value. In light of these three reasons the men will tend to give a greater value to the present goods than to the futures, even if they are of the same class and are in the same quantity, and to induce them to change the present goods for other future goods there will have to be paid an agio or premium, which allows to equalize the value of the present goods with the one of the future goods. This agio or premium receives the name of interest.

In Böhm-Bawerk's analysis a clear distinction is made between the explanation of the why of interest and the rate of interest determination. This latter problem was undertaken by Böhm-Bawerk with the help of a two classes model, in which the working class



exchanges its labour -future goods producer- by present goods taken from a subsistence fund. With certain subsistence fund and in full employment regime, the wages and the interest will be mutually interdependent. In equilibrium, the workers will receive the discounted value of their products, which would exhaust the subsistence fund, and the interest would be equal to the marginal product of the production process done with detours and extended to all that allowed the existing subsistence fund. The competition will guarantee the adequate adjustments of the equilibrium levels.

Marshall's cash balance theory was developed by him in a verbal way, was later expressed with the help of symbols and equations. In its simplest formulation leads to the equation: $M = kY$, being M the quantity of money, Y the cash income and k the portion of the cash income of the public maintained liquid. What is represented by k in Marshall's analysis is not but the inverse of V in the Fisher equation.

Wicksell distinguished -as Thornton had done before- between the natural rate of interest and the effective rate. While the natural rate was the expected compensation from a capital recently formed, the effective rate is that one that the borrowers must pay to the banks.

In his *Theory of Interest* (1930) Fisher considers that the rate of interest is determined by the impatience to spend the income and by the opportunities to invest it. Fisher distinguishes -as previously Thornton has done- between a nominal and a real rate of interest, which corrects the former according to the prices variations. Another concept, which stands out, is the rate of return over costs, which is a precedent of Keynes marginal efficiency of capital. Fisher's interpretation of interest is made as a function of non-monetary factors -time preference and the productivity of capital- and differs from the monetary theory of interest based on the liquidity preference soon to come. Fisher's main contribution to monetary theory was his *The Purchasing Power of Money* (1911), in which it is enunciated once again the quantity theory of money. Fisher fits the quantity theory in the formula $MV = PT$.

In his interest interpretation, Keynes adheres to the liquidity preference theory. From this point of view, the rate of interest it is functionally related to the quantity of cash that the public wants to retain, decreasing the interest rates as cash balance goes up. The liquidity preference function reflects the different reasons to retain cash: the transactions motive, the precautionary motive and speculative motive.

2. 4. A Classification and evaluation of the reviewed theories

As a way to order this set of theories of very different origins we can use the well-known distinctions between monetary and non-monetary or real theories of interest. Inside the former, we can distinguish those based in the liquidity preference; and in the latter, those based in the time preference and in the productivity of the capital. In our examination, we have seen authors whose theories of interest are developed as a part of -or inside- a monetary theory and logically are monetary theories of interest: Locke's theory of interest, that we have seen above, will be the paradigm of this class of theories; and inside these: Keynes's theory of interest the one which represents best the ones based on the liquidity preference. Some of the real theories of interest that we have seen are developed as a part of -or inside- a capital theory: as it is pure and clearly the Turgot case. The best example of the real theories of interest based on the time

preference examined is the Böhm-Bawerk's. And a case of real theory of interest based in the time preference and in the productivity of capital is the Fisher's one.

It is easy to see that some of the ideas and theories examined stand out from the rest for our purposes: the monetary ideas of Malthus, the theory of interest of Böhm-Bawerk and the quantity theory of Fisher. Malthus emphasis in the money function as store of value, its convenience for saving and the different reasons to preserve it, relates directly money to time, specifically with the future.

As we have showed, Böhm-Bawerk conceives the interest as a premium, which induces to exchange present goods for future goods equalizing their different values. The interest determination is made also in terms of exchange of present goods for future goods. If we admit that money is a good, then this theory relates it to time, present with future. Fisher's quantity theory of money relates -in one side of the equation- the quantity of money to its velocity, indirectly, to time.

3. TIME IN THE ECONOMIC LITERATURE OF THE LAST EIGHTY YEARS

It seems mandatory to continue our search of possible links between time and money reviewing the literature published since Keynes until now. As a cross-section of the results, we have chosen nine of them. In order to give a brief but clear account of them we will proceed naming their titles and giving preferably the word to their own authors in form of shorts extracts to explaining their contents; this procedure will facilitate subsequent conclusions.

As starting point we have chosen a 1930 Simon Kuznets article whose title shows clearly the increasing importance that at this time the question of "Static and Dynamic Economics" had reached, as he says in its depart: "And recently, both on the continent and in this country, the by now venerable dichotomy of static and dynamic economics has been revived. It is to the significance of the latter pair of concepts that this paper addresses itself" (Kuznets, 1930: 426).

Near twenty years later, in 1948, W. C. Hood opens his article "Some Aspects of the Treatment of Time in Economic Theory" saying: "The present period is one in which emphasis on the need for rendering economic theory "dynamic" is widespread. Yet there is little reference in the literature to the concepts and measures of time which are appropriate for the economist". Adding soon after: "It is this situation which has prompted the present writer to ask a few questions concerning the problems posed for the economic theorist who would treat time specifically" (Hood, 1948: 453).

In 1965, almost twenty five years after, *Economica* published an article of M. E. Beesley "The Value of Time Spent in Travelling: Some New Evidence" which his author justified like this: "The valuation of time spent in travelling is important because first, it has been prominent in studies of the value of investments in roads, a form of analysis recently extended to urban railroad transport". And "Second, time spent in travelling is, by definition, time spent on a mode or modes of transport" (Beesley, 1965: 174).



Only a few months later in the same year, *The Economic Journal* published a Gary Becker article entitled “A Theory of the Allocation of Time” which he summarizes saying: “This paper has presented a theory of the allocation of time between different activities. At the heart of the theory is an assumption that households are producers as well as consumers; they produce commodities by combining inputs of goods and time according to the cost-minimisation rules of the traditional theory of the firm” (Becker, 1965: 516).

The same review published in an article from A. C. DeSerpa “A Theory of the Economics of Time” which begins explaining that: “This study represents a theory of consumer behaviour, specifically designed to handle economic problems where in a time dimension is important”. Adding soon below: “The essential features of the model presented in this paper are: (1) utility is a function not only of commodities but also of the time allocated to them; (2) the individual’s decision is subject to two resources constraints, a money constraint and a time constraint; and (3) the decision to consume a specified amount of any commodity requires that some minimum amount of time be allocated to it, but the individual may spend more time in that activity if he so desires. Under these specifications, all the implications of neoclassical theory are preserved and many additional results, applicable to situations involving a time dimension, are generated” (DeSerpa, 1971: 828). His author concludes: “The model developed in this study is neither a theory of working time, nor a theory of leisure time, nor a theory of travel time, but a theory of time” (DeSerpa, 1971: 843).

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In the beginning of the next decade, in 1980, *Kyklos* published “Time in Economic Theory” an article from Joan Robinson which she summarized writing: “Every day, in real life, the past is irrevocable and the future predicted with a margin of uncertainty. In a theoretical model, time can be frozen but it is a common error to confuse a comparison of static position with a movement between them. E. H. Carr claims that historians and natural scientist are alike in having given up the search for grand ‘laws’ and are now content to try to learn ‘how things happen’. To improve the status of economics it is necessary to get rid of logical contradictions, which involves eliminating the concept of static equilibrium, to guard against conception by ideological prejudice and to use the study of history, as it unfolds, to check up the hypotheses that theory suggests” (Robinson, 1980: 228-29).

In 1985, four years later, was published the book entitled *The Economics of Time and Ignorance* which authors were Gerald P. O’Driscoll, JR. and Mario J. Rizzo (O’Driscoll and Rizzo, 1985). With a distance of near ten years, Karen Vaughn characterised it so: “*The Economics of Time and Ignorance* was a watershed event in the history of the Austrian revival. After 1985 it would be impossible to think of Austrian economics as anything but the economics of time and ignorance” (Vaughn, 1994: 134).

Almost twenty years after, in 2004, a book of three volumes was published under the title of *Time in Economic Theory* edited by Stefano Zamagni and Elettra Agliardi It was formed by 75 articles, dating from 1928 to 2002 contributors include: W. Baumol, R. Bausor, P. David, A. Dixit, N. Georgescu-Roegen, S. Grossman, F. Hahn, D. North, P. Samuelson; G. Winston; ranging from issues about the allocation of time, theory of choice, preference reversal and time in equilibrium to the issues of irreversibility, complex systems and the role of time (Zamagni and Agliardi, 2004).

And last, but not least, three years later, in 2007, Christopher C. Klein published a working paper entitled “The Economics of Time as a Resource” whose abstract says: “The characteristics of time as a resource are examined in order to seek evidence of these characteristics in fundamental concepts of Economics. A series of thought experiments on time demonstrate that a constant irreversible rate of time usage underlies the concepts of opportunity cost, time preference, and interest. This leads to the startling suggestion that the root question in Economics concerns the choice of how to spend the time. Thus, the principles of Economics are tied closely to the human perception of time and more closely to the human condition than is generally admitted in undergraduate classes on the subject” (Klein, 2007).

3. 1. Time in economic theory and the economics of time

Let us observe with some perspective this sample of economic literature of the last eighty years whose connecting thread is time. This serial begins with a paper dedicated to the question of the revival of the dichotomy between static and dynamic economics (Kuznets, 1930); the next paper, subsequent in eighteen years, is an answer to the question of the treatment of time in a context in which rendering economic theory dynamic is widespread (Hood, 1948); seventeen years later the valuation of time spent in travelling is an issue in search of new evidence (Beesley, 1965). By the same time, the old resource allocation question is dedicated to a new issue: time, giving as a result a theory of allocation of time (Becker, 1965); nearly five years later a theory of the consumer behaviour is presented and entitled by his author as a theory of the economics of time (DeSerpa, 1971). Nearly ten years afterwards, the question of static and dynamic economics it is settled in a new paper proposing the elimination of static equilibrium (Robinson, 1980). Five years after a book appears which shows the revival of Austrian economics, which identifies its subject with the time and the ignorance (O’Driscoll and Rizzo, 1985). Near twenty years later, it is possible to publish a book of three volumes containing 75 articles dated between 1928 and 2002, which can be grouped, under the common denominator of time in economic theory (Zamagni and Agliardi, 2004). Our own anthology finishes with a working paper dated in 2007, which treats the economics of time as a resource (Klein, 2007).

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It is true that we have not found among all this reviewed literature any article that answers our question, nor we have discover any title of them in which time and money appeared explicitly related, but we have now a general vision of the literature of the last eighty years that could be included into the categories of “Time in Economic Theory” and “The Economics of Time”. And some of the questions posed and some of the answers given will help us, even subconsciously, to solve our own.

4. IDEAS AND THEORIES SELECTED

What have we learned from our round trip regarding our question? From our first stop we concluded above that it was easy to see that some of the ideas and theories examined stand out from the rest for our purposes:

Malthus emphasis in the money function as store of value, its convenience for saving and the different reasons to preserve it, relates directly money to time, specifically with the future.



As we have showed, Böhm-Bawerk conceives the interest as a premium, which induces to exchange present goods for future goods equalizing their different values. The interest determination is made also in terms of exchange of present goods for future goods. If we admit that money is a good, then this theory relates it to time, present and future.

Fisher's quantity theory of money relates -in one side of the equation- the quantity of money to its velocity, indirectly, to time.

From the second stop we will retain here a sentence of the last paper of the serial reviewed -“A series of thought experiments on time demonstrate that a constant irreversible rate of time usage underlies the concepts of opportunity cost, time preference, and interest” (Klein, 2007)-by reason of the suggestions it offers when associated with the concepts and ideas chosen from our first stop -that we have just mentioned above- to give an answer to our question.

5. OUR ANSWERS TO OUR QUESTION

It is not by chance that interest as theory and as concept figures successively as a coincident result in our two stops of the search we have done until now. And it also will be the point of departure to expose our answer.

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5. 1. The Banks as Time Convertors and Money Creators

We all know that banks are the principal financial intermediaries whose main business entails the conversion of deposits into loans. Since the maturities, quantities and qualities of loans and deposits are diverse and different to one another, the banks match them by performing a series of sequential transformations by virtue of creating bank money, taking primary financial assets -as legal tender- and turning them into indirect financial assets -deposits-, and so acting in effect as time convertors. Because of the lack of coincidence of the different maturities and quantities and qualities of the cash-in and cash-out transactions it is that the banks are capable of creating bank money.

From both sides, it is because of time that banks carry-on their business: to convert legal money into bank money. So we can then say that for banks “time is money”.

5. 2. The opportunity cost of the employment of time

5. 2. 1. *Time, life and lifetime*

We are going, first of all, to establish some very simple but fundamental considerations for subsequent development of this approach.

Time is a very ample concept, which includes many different meanings. In one of its more general senses it can be associated with life: the time associated with life, in its largest way, is lifetime.

The expression lifetime indicates how the term life is inseparable from the term time. We could not conceive an existence or life without the presence of time, and their simultaneousness is reflected in their use as synonymous. In this sense, economic

activity as part of human activity is carried out in the course of time. This reality is so evident that seems nonsense to be remembered, but the reader must be conscious that a great part of this work is based on the explicit presence of time on which economic activity is laid or implicit in many economic theories.

5. 2. 2. *The two possible employments of time: Labour and no labour time*

From this point of view, we can consider two general employments of time: its employment in labour and its employment in no labour. We have preferred to use the latter category because it is broader than leisure and in consequence it allows one to include another uses of time which do not fit in leisure as, among many others, the employed to eat, sleep or visiting the doctor.

In this sense, the opportunity cost of the employment of the time of a person in labour is the time that this person could have employed in no labour. And vice versa: the opportunity cost of the time employed in no labour is the time that could have been employed in labour. The opportunity cost of the former is a cost in real terms: the time which could have been employed in non-labour; but the latter could be expressed in monetary terms: the money that this person could have earned if he had employed this time in labour. Consequently, both types of employment of time could be measured in money: the money received for the labour done and the money not received for the labour not done. Consequently, we can conclude that any employment of time can be measured in money.

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5. 3. The labour time approach

The former approach, when measuring the opportunity cost of two possible employments of time distinguished between in labour and in no labour. As now we proposed a time labour approach, it could be not easy to differentiate them because in fact they are intimately related.

Departing from the labour theory of value in Adam Smith, we will dispose of a simple scheme which when making explicit the underlying temporal dimension shows how the preceding opportunity cost reasoning fits in the basis of the classical theory of value and lets us to identify time with money in labour terms.

5. 3. 1. *Smith and the labour-theory of value*

As Smith considers that the wealth of a nation depends mainly on labour and its division, logically, he defends a theory of value based on labour. The subsequent interpretation of this theory of Smith by Ricardo is at the origin of the nowadays version of it. According to it, Smith had two theories of value: a first one, based on commanded labour; and the second, based on embodied labour.

According to what he said in the “Introduction and Plan of the Work”, Smith began the first book studying “Of the Division of Labour” (Chapter I). This one increases the productivity of labour and, therefore, the product quantity. Each unit of this product is cheaper because it has been made with less labour but it is more abundant than before. That is why the division of labour is the basis of the wealth of a nation. But Smith also noticed “That the Division of Labour is limited by the Extent of the Market” (Ch. III). The successive division of labour requires the extension of the market and makes



possible an increasing exchange, and to avoid the problems arising from barter money appeared and extended, as Smith explains in “Of the Origin and Use of Money” (Ch. IV). Consequently, there will be two kinds of prices: “Of the real and nominal Price of Commodities or of their Price in Labour, and their price in Money” (Ch. V).

Smith enunciates in the latter (Ch.V) what we call nowadays his commanded labour theory of value when saying:

The value of any commodity, therefore, to the person who possesses it, and who means not to use or consume it himself, but to exchange it for other commodities, is equal to the quantity of labour which it enables him to purchase and command. Labour, therefore is the real measure of the exchangeable value of all commodities (Smith, 1981: 47).

And the so-called embodied labour theory of value when he adds soon later:

What is bought with money or with goods is purchased by labour as much as what we acquire by the toil of our own body. That money or those goods indeed save us this toil. They contain the value of a certain quantity of labour, which we exchange for what is supposed at the time to contain the value of an equal quantity (Smith, 1981: 46-47).

In “Of the component Parts of the Commodities” (Ch.VI) Smith adverts that as a consequence of the appropriation of land and the accumulation of stock, the price of a commodity should not only pay the labour, but also the land and the stock employed to make it, therefore, the price of the good must cover the price of factors employed to obtain it: wages, rent and profits.

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After treating “Of The natural and market Price of Commodities” (Ch.VII), Smith begins analyzing the origins of component parts of the commodities in “Of the wages of Labour” (Ch. VIII):

In that original state of things, which precedes both the appropriation of land and the accumulation of stock, the whole product of labour belongs to the labourer. He has neither landlord nor master with him (Smith, 1981: 82). Adding below:

But this original state of things, in which the labourer enjoyed the whole produce of his own labour, could not last beyond the first introduction of the appropriation of land and the accumulation of stock (Smith, 1981: 82).

Smith explains successively the origins of rent and profit as deductions from the produce of the labourer, and the wages as advance from the stock of master:

As soon as land becomes private property, the landlord demands a share of almost all the produce, which the labourer can either raise, or collect from it. His rent makes the first deduction from the produce of the labour, which is employed upon a land. It seldom happens that the person who tills the ground has wherewithal to maintain himself till he reaps the harvest. His maintenance is generally advanced to him from the stock of master, the farmer who employs

him, and who would have no interest to employ him, unless he was to share in the produce of his labour, or unless his stock was to be replaced to him with a profit. This profit makes a second deduction from the produce of the labour, which is employed upon land. The produce of almost all other labour is liable to the like deduction of profit. In all arts and manufactures the greater part of the workmen stands in need of a master to advance them the materials of their work, and their wages and maintenance till it will be completed. He shares in the produce of their labour, or in the value, which it adds to the materials upon which it is bestowed; and in his share consists his profit (Smith, 1981: 83).

We have seen how Smith explains the causes of wealth throughout labour and its division, its inseparable links with the extension of the market and the use of money; his labour-theory of value; and an explanation of the origins of rent, profit and wages. It is enough to do explicit the time -which lays implicitly present in this ensemble of these theories- to show how in terms of labour it is money.

As we all know, one of the functions of money is to serve as a unit of account. And time, by its side, also can be used as unit of account of many genders, for example, as unit of measure of labour -depending on the purpose: in hours, days, months and years-, and so it becomes labour time. A labour time which is sold in the market in exchange for money. This monetary wage received can be, totally spent in goods and services or partially saved thanks to another money function: store of value -serving, as example pointed by Malthus, to order or demand labour in the future. Therefore, labour time is a kind of time that can be exchanged for money, and money can buy a kind of time that is the labour time. In consequence, we can say that: in terms of labour time is money and money is time.

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6. TIME AND MONEY TRADE-OFF IN LATE EUROPEAN CRISES

As a practical application of the answers given in this research to the question of the identification of time as money and the expression of one in terms of the other, we have chosen, as the ground field to test them, the sequence that begins with the 2007 sub-prime mortgage crisis in the U.S. and continues until today's European own crisis with Greece's bail-out negotiation (2015). This series collect financial, economic and political key problems of U.S. and Europe along the last 8 years that justifies its global importance and its choosing as illustration of the trade-off between time and money, their disruptions and consequences. We do not pretend to question a single one or a set of the numerous interpretations done of these successive crises in the literature of reference; on the contrary, although not alluded explicitly here, they make possible our exercise of illustration.

Essentially, the sequence started with the 2006 burst of the U.S. housing bubble, followed by the subsequent sub-prime mortgage crisis and the fall of Lehman Brothers in 2007, triggering a global Great Recession that commencing by the end of 2008 finished by mid 2009 in the U.S., but that in Europe coupled with a debt crisis, was prolonged until 2012, with consequences reaching until now, dramatically expressed in Greece's case under today's bail-out negotiation.



Following such succession of inter-linked crises what do we observe from the perspective of the trade-off between time and money? This long and complex process, expressed here in these simple terms, meant, in each one of its phases, a complete disturbance of the respective pre-existing balances of the interrelations between money and time. Disruptions expressed, at least, in the three ways we used above to answer the general question of the identification of time as money: the banks as time convertors and money creators; the opportunity cost of the employment of time; and the labour time approach.

As we all know, banks are the more important financial intermediaries and, as such, they have been present and have played a central and decisive role in each one of these crises. As stated above, the banks to carry on their business -transforming deposits into loans-, convert the terms of time of the deposits into the ones of the loans. And also because the diversity and lack of coincidence of times and quantities and qualities of the ins and outs of cash in banks, allows them to create bank money or deposits. Being these two faculties of time convertors and money creators inseparable from each other, an important variation in the conditions prevailing, for instance, in the times, qualities or quantities of the ins or outs of cash will affect the creation of deposits and its terms in time, qualities or quantities, and, in turn, its conversion into loans and its terms in time, qualities or quantities. This simple example serves as an elemental illustration of a disruption of a previous balance in the interrelation between time and money as part of the banks link in the chain of crises under consideration.

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To this illustration of the trade-off between time and money in the financial sector, can be added the corresponding one to its second expression: the opportunity cost of the employment of time. As stated above, this approach, showing the evident simultaneousness of time and life, distinguishes two generic possible employments of time: in labour and no labour; as the opportunity cost of both employments can be measured in monetary terms, it concludes that any employment of time can be measured in money. As is well known, the consequences of the so-called Great Recession have been different not only by its duration in the U.S. (2008-2009) and in Europe (2008-12) but by its intensity; specially, the unemployment of the labour force rate has been, and still is, on the whole, greater in the latter than in the former; and, within Europe, in the countries belonging to the U. E., and inside the latter, in the euro-zone ones; and within these, in Spain and Greece, in this order. It is evident that such rates of unemployment disturbed, for instance, the preceding respective maps of the opportunity cost of the employment of time, and constitutes our second example of the alterations of the interchange of time and money. It does not seem necessary to say that, for example, young people, or old people, in search of a first, or a new job, could not exercise the same choice of employment of their time in labour and non-labour in a context of economic growth that in one of rising unemployment.

The labour time approach, will serve as third illustration of the disruptions induced in the interrelation between time and money by this sequence of crises; as we showed before, it sets the process of the employment of time in labour in an economy whose working model it is the one described by Smith in the *Wealth of Nations*. According to this, labour time is a kind of time that can be exchanged for money, and money can buy a kind of time that is the labour time. Therefore, in labour terms, time is money, and money is time. By referring again to the Great Recession and its effects on growth and

employment in the spatial distribution above indicated, the disturbance induced in the earlier balance of the exchange of labour time by money, and money by labour time is patent; as, for instance, in Spain or Greece, where, in amount, and being not inflationary their contexts, in the new balance of such trade-off, the same quantity of labour time can not be exchanged by the same quantity of money, but less; and the same quantity of money can not be exchanged by the same quantity of labour time, but more.

7. CONCLUSIONS

It is not necessary to remember that the origins of this paper are founded in the well-known motto “Time is Money”. It is precisely this explicit identification of time as money that made it especially suitable for consideration as a subject of economic enquiry. This essay opened questioning if economic analysis could provide reasons to justify this identification of time as money allowing us to express one in terms of the other. To answer these questions we began searching in the field of the history of economic thought, doctrines, theories or analysis which relate time to money.

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Some of the ideas and theories examined stood out from the rest for our purposes: the monetary ideas of Malthus, the theory of interest of Böhm-Bawerk and the quantity theory of Fisher; the two former ones related time directly to money, and the third indirectly. We continued our search of possible links between time and money reviewing the literature published since Keynes until now. As a cross-section of the results, we chose nine of them. We did not find among all this reviewed literature any article that answers our question, but it gave us a general vision of the literature related with time of the last eighty years that allowed us to include it into the categories of Time in Economic Theory and the Economics of Time. And some of the questions posed and some of the answers given in said sample helped us, even subconsciously, to solve ours. It is not by chance that interest as theory and as concept figured successively as coincident result of our two stops search. And it was also the point of departure to expose our answers. The first one refers to the financial sector of an economy: For banks “Time is Money” because to carry on their business -transforming deposits into loans- they convert the terms of time of the first into the ones of the latter. And also because the diversity and lack of coincidence of times and quantities and qualities of the ins and outs of cash in the banks, allows them to create bank money or deposits.

The second one, showing the evident simultaneousness of time and life, distinguishes two generic possible employments of time: in labour and no labour; as the opportunity cost of both employments can be measured in monetary terms, we concluded that any employment of time can be measured in money. The third one sets the process of the employment of time in labour in an economy which working model is the described one by Smith in the Wealth of Nations. According to this, labour time is a kind of time that can be exchanged for money, and money can buy a kind of time that is the labour time. Therefore, in labour terms, time is money, and money is time. It seems that these three answers show what Franklin states and what we analyzed in economic terms he explained with examples, that is to say, that “Time is Money”. And, last but not least, in order to show the practical side of this research to economics, we show the application



of the three answers found to illustrate the trade-off between time and money in the recent European crises.

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¹ To accomplish this task, in the next epigraph (2.) we shall follow as a general guiding thread, Spiegel’s *History of the Growth of Economic Thought* (Spiegel, 1991). This work is clear and rigorous, and as it attends not only to the discovery context as well as the validation one, it is specially indicated for the intended reconstruction. As summarized permanent reference we will avoid its quotation.

