Continuidad y Ruptura en el Pensamiento Económico:

El Sistema Teórico de los Clásicos

The Theoretical System of Classical Economics.
Continuity and Rupture

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Tesis para obtener el grado de

Maestro en Docencia Económica,

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Posgrado en Economía, Facultad de Economía

Universidad Nacional Autónoma de México

UNAM

Octubre del 2004

Para mis amores
Saskia, Sophia Elena y Marcelis Maclovio

In memoriam
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ABSTRACT

CONTINUIDAD Y RUPTURA EN EL PENSAMIENTO ECONOMICO: EL SISTEMA TEORICO DE LOS CLASICOS

Presento una reconstrucción racional del Sistema Teórico de los Clásicos: Smith, Ricardo y Marx, usando la Metodología de Lakatos. Analizo dos desarrollos neoclásicos, función de producción agregada y equilibrio general de Walras. Tambien el reto de Keynes y los Nuevos Clásicos. La economía política clásica tiene como tema principal la sustentabilidad de alternativas sociales para la creación y distribución de la riqueza. El papel de los mercados libres competitivos en la determinación de precios relativos es central, la dinámica de otras variables económicas es inseparable del sistema de precios, sin ser reducible al mismo, ello implica un análisis de equilibrio general. Las ganancias y el capital resultan determinantes en el capitalismo. Se identifican dos perspectivas: con Smith las ganancias como el costo del capital. Con Ricardo las ganancias como residuo. La concepción Smithiana y la visión física del capital, resultan insostenibles. Las ganancias son un residuo y el capital es el derecho de propiedad sobre éstas. Su valor depende de las ganancias futuras. Concluyo que el enfoque de función de producción para analizar la problemática macroeconómica resulta inadecuado. Keynes resulta compatible con el Sistema Clásico, sin desarrollar el vínculo con el sistema de precios, ni el problema de las ganancias y el capital. Los Nuevos Clásicos adoptan la visión Smithiana y reducen la economía al comportamiento de un individuo maximizador de utilidad, abandonando el enfoque clásico. Propongo adoptar la visión Ricardiana con una perspectiva de equilibrio general, reconociendo al capital como derecho de propiedad, en un programa de investigación clásico.

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Introduction: Free Markets and Capitalism.

In "The Modern Mind", an amazing journey through the intellectual history of the 20th-century, Peter Watson[1] identifies the three most important forces shaping modern societies: science, free markets and liberal democracies. In his view forces that are working together shaping one story for the whole of humankind. He is very careful not to fall in simplistic interpretations of History as a previously written script where humans are going somewhere pulled by something: an idea, the economy, or by whatever other teleological force of choice. However, Watson is quite optimistic about the future, or we may say, about a future where rationality, individual liberty and the peaceful solution of conflicts become the rule not the exception in dealing with human affairs. Hence the name of the last chapter of his book "The Positive Hour". Open societies and free markets triumphed in the 20th century and will hopefully prevail in the 21st. Can we share his optimism? Are there not major forces within and outside the democratic, free market western type societies that have the potential of destroying the enlightened future that Watson posits and desires, and which seem to be an appealing future for vast sectors of the world? The answer is clearly yes. As Karl Popper expressed it, open societies have enemies. Personal liberties, democratic institutions, truly free competitive markets, rational debates supported by science to guide public policies, are still very, very far, from a generalized reality in the world. The dangers for open societies come from both within and from outside their realm of existence. From outside the tragic events of New York, September 11, 2001 and Madrid, March 11, 2004, among others, highlight the dangers of extreme ideological and religious fundamentalism, irrational beliefs that cannot change or should not be changed, revealed truths that are not subject to a rational criticism or analytical discussion. They can only

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[1] Watson, Peter. "The Modern Mind" An Intellectual History of the Xxth Century. HarperCollins Publishers. 2001. P. 652. Throughout this essay the bibliographical references will be presented directly in the footnotes. I will try to limit them to the extent of the necessary.

be imposed. From within, the pervasive slow growth, poverty and the continuing instability of "The Global Capitalist System", to borrow the phrase from George Soros book,[2] aptly subtitled Open Society Endangered, are maybe the biggest challenges to the future of open societies. At least from the perspective of the economist.

The startling material and intellectual advances of the 20th century, were accompanied by wars that cost around 100 million lives, by economic and financial crises that, if not led to wars directly, they certainly contributed to some of the most serious ones, as the Great Depression and World War II. Crises that meant huge losses for the world in terms of welfare and opportunity, and that set back for decades the hopes of development for countries and continents as well. The beginning of this century inaugurated a new and certainly not very auspicious type of war, where the enemy is not a nation state or anything like it, but a network of fundamentalists ready to use terror in whatever place and scale they can, and with no more restrain than their ability to muster resources to wage it. The new century begins if not with another Great Depression, certainly with a Great Recession, using Paul Krugman's phrase, that finally made its way from the periphery of global capitalism, Latin America and Asia to the center itself. In the mid-1990s, when financial crises where still considered a phenomenon affecting mostly badly-run emerging economies, Paul Krugman in "Peddling Prosperity" said that slow growth and productivity on the one hand and rising poverty on the other were the two main economic problems still outstanding: *"Everything else is either of secondary importance, or a non-issue"*. Of course these two problems are still two of the three main problems still outstanding for political economy, the third is the Return of Depression Economics, as Krugman aptly titled his 1999 book. These problems threaten the center and the perifery as well, they require a critical revision of the global and domestic economic policies and their scientific foundations. Paraphrasing Joseph Stiglitz[3] in "Globalization

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[2] Soros, George. "The Crisis of Global Capitalism." Open Society Endangered. Public Affairs, New York, 1998.
[3] Stiglitz, Joseph E. "Globalization and its Discontents" W. W. Norton & Company New York London. 2002.

and its Discontents", if the broken promises of global institutions in terms of development and stability are ever to be delivered, their policies need to be radically rethought. Regaining growth and fighting poverty, necessarily pass through the understanding and the attenuation or elimination of the instability of the global capitalist system. Instability that for George Soros is the main present danger for open societies. You do not have to agree with Mr. Soros analysis, conclusions or prescriptions, to agree with this statement. The promises of a rational, free, and democratic society can only be fulfilled with prosperity for all. Political Fundamentalism will lose most of its breeding grounds with prosperity, freedom and justice. Ideological fundamentalism will be contained with the spread of critical thinking and rational analysis, that is with science.

In the field of economics, or in classical terms political economy, it is necessary to review critically the state of the discipline. In particular the a-critical identification of free markets with capitalism should be reconsidered. The nature of profits and capital itself, the stability or instability of modern capitalist economies, financial crises, the problems of growth and poverty, are in my view the central problems that need a radical re-thinking, to come up with new answers and policies. Quoting Krugman again, *"We will not achieve the understanding we need, however, unless we are willing to think clearly about our problems and to follow those thoughts wherever they lead. Some people say that the problems of Japan, of emerging Asia, of Brazil are structural, with no quick cure available; but I believe that the only important structural obstacles to world prosperity are the obsolete doctrines that clutter the minds of men."*[4] At the beginning of the XXIst Century the state of economics and of its derived economic policies seems to be quite close to the state of philosophical and scientific affairs at the end of the nineteenth century, when *"dogmatic rigidity prevailed in matters of principle"* as a young Einstein described it.

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[4] Krugman, Paul. "The Return of Depression Economics" W. W. Norton & Co. New York London. 1999.

Political economy or, in its contemporary and somewhat diluted form, economics, saw in the 19th and the 20th centuries an impressive advance as a discipline that can be considered scientific. Contemporary neoclassical standard economics is the dominant view in the discipline. It is often presented like a complete solid, single, theoretical body where the fundamental problems have been solved and where there are no significant gaps or shortcomings, particularly not of the kind that threatens the solidity of its foundations. The textbook and classroom teachings, more often than not, hide the unsolved problems or simply forget about still valid criticisms of old-but-never-settled controversies, and proceed by a complacent revelation of received theory. Research focuses on a innumerable world of ever more formally complex but substantially simple, if not simplistic, problems. One gets the feeling that the intellectual drive is not anymore that of an on-going, permanent inquiry of a science not afraid to display openly its shortcomings and to point its own errors, to look critically at its own foundations and ask if everything is really well in the building. On revising the enormous amount of work that is produced daily, published in specialized journals and posted on the internet, one cannot help to wonder, are we lost not in the trees, but on the leaves and the minimal branches of the forest, simply assuming that all is well in the forest or that there is no forest at all. The sophistication of the models and the tools of the trade have created a seemingly impenetrable barrier, even to the educated laymen, it seems that only very able quasi-mathematicians can deal with the stuff. The technical sophistication of the discipline has tended a veil over central issues that still are far from satisfactorily resolved and are hiding behind an apparent ocean of fundamental agreement. This is not to say that the advances are nill or that there is not a wide area of "settled" questions, what I am saying is that the ediffice is far from complete, and some of its foundations are simply wrong and they need to be re-established. Economics is today an unsettled field, only a superficial view on the complexity of the subject matter, a willingness to swallow hypothesis that are at most tentative and lack solid theoretical foundation, and an ideological adherence to doctrinaire not scientific principles, can explain the complacence of the standard teachings

in the field. From outside the discipline, but with definitive consequences for its development, there are two major questions that need to be critically revised, first the superficial assimilation of free markets and capitalism and second the practical abandonment of serious epistemological standards to guide the development of economics as a scientific discipline, together with the widespread adoption of a 19th century Millian type of verificationism as 'the' methodology of economics.

It can be said that there is not much disagreement, outside of fundamentalists' circles at least, about the economic and social benefits of free markets as a way of organizing economic life. The bulk of scientific advances within economics have taken place within an analytical tradition showing the efficiency of markets as a way to allocate resources while promoting and preserving individual liberties. This is not to say that pure free markets are the prevailing form of economic organization in the real world. Market failures are pervasive and they can have tremendous negative effects on the well being of the population. Nevertheless, few people would disagree with the idea that people should be free to chose the goods and services they want to consume and the jobs they want to hold and that free competitive markets can produce better results in the allocation of scarce resources and pricing, than other existing alternatives. These nowadays relatively accepted views find solid theoretical and scientific support from economics as a scientific enterprise, particularly through the development of general equilibrium and welfare economics. General equilibrium theorizing has succeeded in providing a solid foundation for value and price theories, as well as a normative framework to deal with welfare issues. General equilibrium is the theory of pure free markets. However, it still has not been fully integrated to the variety of relatively independent, redundant and mutually inconsistent theories of income, employment, profits and capital, financial markets, to explain the complex dynamics of modern capitalist economies. An integrated theory of capitalism is required. In my view free markets and capitalism should be clearly differentiated. The prevailing view in

standard economics is that free markets and capitalism are one and the same thing. All the positive, theoretical and practical, attributes of free markets are handed over to capitalism. The anti-capitalists attribute all the evils, real or posited, of capitalism to free markets. Scholars in the minority view, have contended that free markets are distinct from capitalism and that the virtues and vices of each are not freely attributable to each other.

Outside of economics, where the difference between free markets and capitalism is a non-problem, the acritical ideological identification of free markets with capitalism is evident in the works of Francis Fukuyama.[5] Fukuyama's starting (ending) point, is based on the fact that the preceding years had seen the triumph of liberal democracies all over the world, and for him this marked the 'endpoint of mankind's ideological evolution' and the final form of human government'. Fukuyama sought to show that there is, as he put it, a Universal History, a single, coherent evolutionary process that takes into account 'the experiences of all peoples in all times.' For Fukuyama, the logic of modern natural science would seem to dictate a universal evolution in the direction of capitalism. Marx said that Hegel's idealistic view of history had to be turned on its feet. History was going somewhere and was moved by ideas, in Hegel by The Idea. Marx by turning him around posited the same, History is going somewhere, but moved by the productive forces, by the economics of mankind. Fukuyama set Hegel again on its head and rewrote Marx's communist manifesto as a capitalists' manifesto. Fukuyama's manifesto is as ideological as Marx's.

For the historian Fernand Braudel the free market and capitalism are totally different social phenomena. In his classic historical analysis of pre-industrial Europe[6], Braudel, challenges the view that the development of the continent consisted of the gradual progress towards the rational world of the market, the firm, and capitalist investment until the coming of the industrial

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[5] Fukuyama, Francis "The End of History and the last Man" 1992.

revolution, which neatly divides human history in two. He contends that the observable patterns of historical evolution before the nineteenth century are a lot more complicated than the prevailing textbook version, and that they consist in the coexistence and interaction of a free-market economy, formed by the mechanisms of production and exchange linked to rural activities, to small shops and workshops, to banks, exchanges, fairs and (of course) markets. With two other clearly differentiated areas of the economy: below the free market, the infra-economy, and above the free market, capitalism. It was based on the observation and analysis of the realities and processes of the free markets where economics as a discipline, was developed. However, this area of human activities, the free market, was not the only one: under it or "lying underneath" to use Braudel's words, is an elementary layer of basic activity, an infra-economy, the informal other half of economic activity, the world of self-sufficiency, and barter of goods and services within a small area. Besides and above these two socio-economic structures, the self-sufficient and barter economy and the free-market economy, there is capitalism. In Braudel's words: *"...looking up instead of down from the vast plane of the market economy, one finds that active social hierarchies were constructed on top of it: they could manipulate the exchange to their advantage and disturb the established order. In their desire to do so - which was not always consciously expressed - they created anomalies 'zones of turbulence' and conducted their affairs in a very individual way. At this exalted level, a few wealthy merchants in eighteenth-century Amsterdam or sixteenth-century Genoa could throw whole sectors of the European or even world economy into confusion, from a distance. Certain groups of privileged actors were engaged in circuits and calculations that ordinary people knew nothing of. Foreign exchange for example, which was tied to distant trade movements and to the complicated arrangements for credit, was a sophisticated art, open only to a few initiates at most. To me, this second shadowy zone, hovering above the sunlit world of the market economy and constituting its upper limit so to speak,*

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[6] Braudel, Fernand. "Civilization & Capitalism" 15th-18th Century. Vols.I, II, III. See Vol. III. The Perspective of the World. In particular, 'By Way of Conclusion: Past and Present.' Pp. 619-32. Harper & Row, Publishers. 1979.

represents the favored domain of capitalism, as we shall see. Without this zone, capitalism is unthinkable: this is where it takes up residence and prospers." Braudel believes that this three level model of economies in the pre-industrial world is still valid in present day societies. *"The market economy still controls the great mass of transactions that show up in the statistics. But free competition, which is the distinctive characteristic of the market, is very far from ruling the present day economy - as nobody would deny. Today, as in the past, there is a world apart, where an exceptional kind of capitalism goes on, to my mind the only real capitalism: today, as in the past, it is multinational, a close relation of the capitalism operated by the great Indies Companies, and the monopolies of all sizes, official or unofficial, which existed then and which were exactly analogous in principle to the monopolies of today."*[7] Braudel differentiates between the free market economy and capitalism based on an extremely detailed and careful historical reconstruction of the European world economy for three centuries. What Braudel conceptualizes as capitalism in the pre-industrial world is what Smith saw as the mercantile system, against which he argued for his 'System of Natural Liberty,' that is to a pure free market system. Braudel's distinctions are mostly descriptive, extremely powerful as far as historical evidence, but lacking a clear analytical foundation. He sees a clear difference between capitalism and free markets based on historical analysis, but when the time to comes to define this difference in analytical terms, unfortunately, he does not provide us with a satisfactory answer. He points out, however, towards a politically based definition: capitalism exists through its alliance with the state.

This essay is the first part of an ongoing research programme on Free Markets and Capitalism. It consists on a critical revision of the current state of our discipline from the perspective of classical political economy and adopting an epistemological stance based on the contributions of Karl Popper and Imre Lakatos.[8] The second part of my research programme will develop theoretical

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[7] Braudel, F. op. Cit. Vol. I. P. 24
[8] In the late 80s and early 90s, as a very young scholar teaching political economy and history of economic thought at the Universidad Autónoma de Baja California Sur, UABCS, in La Paz BCS, México, I came

alternatives to the main problems identified in this essay, the determination of profits and the profit rate, the value of capital, and implications for the dynamics of modern capitalist economies as distinct from pure free market economies. In the last part of my future research programme I will apply my theoretical results to the study of some central contemporary problems and derive some public policy considerations.

The present essay is a work of rational reconstruction in the field of economics, inspired by Imre Lakatos' proposals. My goal is to identify the "authentic hard core" of the scientific research programme of classical political economy, economics in short, as represented by the central works of Adam Smith, David Ricardo and Karl Marx, classical economist and *the* critic of political economy. So my work is a theoretical, not an historical, contribution. I am not concerned with what exactly Smith, Ricardo or Marx, wrote, said, meant, thought, etc.; but rather with the common deductive structure of their works, what I will call, the theoretical system of classical political economy. I will use this rational reconstruction as a tool for the critical analysis of some of the most relevant contemporary currents of economic thought, and to identify some of the central theoretical problems that need to be addressed in order to explain the aggregate dynamics of modern capitalist economies.

I will argue that classical political economy constitutes a relatively well developed science with a common domain: the generation and the distribution of wealth, with a short and a long-run consideration; and with a relatively complete shared theoretical system, characterized by two alternative explanations regarding the system's dynamics that revolve around two different perspectives

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across Mark Blaug's third edition of his classic "Economic Theory in Retrospect." I was immediately fascinated with the use of the methodological standards provided by the philosophers of science Karl Popper and Imre Lakatos for the critical analysis of economics as a scientific discipline, that Blaug initiated in his *methodological postscript*. As an economist from the Facultad de Economía, CU, de la Universidad Nacional Autónoma de México, UNAM, trained in the Marxian-Classical tradition of Political Economy, I took the integration of philosophy and economics at a stride. The rational liberalism of Popper and the liber-anarchism of Lakatos, fitted perfectly with my background and my personal inclinations, which never ceased to annoy my left-wing colleagues. Until now, I have never had the opportunity to cross words with Prof. Mark

on profits. These, I identify as the Smithian, profits as a cost, and the Ricardian, profits as a residual, perspectives. It is my contention that contemporary economics is still fractured around this divide and that some of the crucial unresolved theoretical debates of recent times are directly traceable to these central questions: What is the nature of profits and capital? And how profits and capital impinge on the dynamics of free markets and of capitalism as distinct social entities? It is my view that the correct perspective is the Ricardian.

In the first section I will develop the concept of Theoretical System as the "authentic hard core" of a scientific research programme, SRP, elaborating on some of Lakatos' proposals. My concept of theoretical systems, of obvious Popperian/Lakatosian heritage, goes further than Lakatos somewhat ambiguous and not sufficiently elaborated concept of the hard core, and provides in my view a solid analytical tool to deal with some of the problems of the conmensurability and the growth of knowledge, as well as with the question of *Verstehen*— understanding—in social sciences. The epistemological[9] discussion is kept at a minimum a brief concluding note is added at the end of Section 5. Of course, the proof is in the pudding, the following two sections, 2 and 3, proceed to the rational reconstruction of the theoretical system of Classical Political Economy as represented by Smith, Ricardo and Marx, as an ensemble. For many, for sure, an act of sacrilege. But, I hope to show, a fruitful exercise. I concentrate on the problems of profits and capital. Section 4 proceeds to the analysis of neoclassical developments: general equilibrium and aggregate production function analysis, from the perspective of the classicals and appraising them using the previously developed framework. Section 5 analyzes the Keynesian challenge, considering also some contemporary 'Keynesian' inspired currents like the neoclassical synthesis and the New Keynesians as well as their theoretical adversaries the

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Blaug, so I would not dare to say I am his disciple. However, his influence has been decisive in my intellectual formation and it should be evident throughout this work. The usual disclaimer applies.
[9] My approach to the philosophy of science is radically different to the prevailing two views in mainstream social sciences: On one hand, the rampant Millian verificationism of the so called New Classical Economists and the so-called school of the Scientific Inference in Qualitative Research, to name just two examples. And on the other, the methodological pluralism, where everything goes, as long, of course, it is 'alternative', and

New Classicals. Finally, I conclude this essay with the summary and conclusions of the previous sections and a brief description of my research programme.

I consider that the study of the continuity of economic thought, can prove more fruitful, in terms of contributing to the development of the discipline, than the study of the differences and of the ruptures that are part and parcel of the development of any form of knowledge. I believe, that the rational reconstruction of the theoretical system that, implicitly or explicitly, is at the heart of every scientific discipline, can establish the deductive structure—the analytical common ground—that entails the continuity in the development of a particular science. By doing so, alternative explanations, instances of rupture, etc., can be logically established—not simply described or assumed—and maybe, eventually, settled. I believe that stressing the differences is sometimes, maybe most of the time, a fruitless exercise, a way to define labels as an identification of ideological or political inclinations. From a practical economic policy perspective, if we are able to identify our shared theoretical heritage, what we economists as practitioners of a scientific discipline have in common, we may find it easier to agree on what to do, to better the world we share as well...

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politically correct. But this is another story, when necessary and possible, I will confine some related points to footnotes.

1. An epistemological note.

> "El auténtico centro firme del programa no nace ya dotado de toda su fuerza como Atenea de la cabeza de Zeus. Se desarrolla lentamente mediante un proceso largo, preliminar, de ensayos y errores."
>
> "La primera etapa de cualquier crítica seria de una teoría científica es reconstruir y mejorar su articulación lógico deductiva."
>
> "La crítica no *supone* la existencia de una estructura deductiva enteramente articulada, sino que la crea."
>
> Imre Lakatos.[10]

Mark Blaug in his study about the historiography of economics, distinguishes four approaches: *Geistesgeschichte* that "tries to identify the central questions that past thinkers have posed and to show how theory came to be central in their systems of thought"; "historical reconstructions" that attempt "to give an account of past thinkers' systems of thought in their own terms"; "rational reconstructions" which analyze the ideas of great thinkers of the past" in order to locate their 'mistakes' and to verify that there has been rational progress in the course of intellectual history." And finally, doxography: "the attempt to fill all texts into some recent orthodoxy to show that all those who have ever worked in the field have in substance treated exactly the same deep fundamental questions. [11] Of these the first three are for Blaug acceptable approaches, even though it is easy to confuse the second and the third. Doxographies, of course, should be rejected.

This is a work of rational reconstruction, but not with the idea to locate some past thinkers' mistakes, as Blaug conceives it, but with the Lakatosian idea to identify the authentic "hard core" of the scientific[12] research programme of

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[10] Lakatos, Imre. "La metodología de los programas de investigación científica." Alianza Universidad AU 349. 1983. Pie de página #161 P.67; P. 60; y Pie de página 150 P. 63

[11] Blaug, Mark. 1990. "On the historiography of Economics." Journal of the History of Economic Thought" 12(1) Spring 27-37. pp.27-8. Blaug's take on our subject is summarized in "Classical Economics", in Eatwell, J. Millgate, M. and Newman, P. eds. The New Palgrave Dictionary of Economics, London: Macmillan, Vol. 1 434-45.

[12] A definition of science consistent with Popper's and Lakatos' view is: "it is the desire for explanations that are at once systematic and controlled by factual evidence that generates science; and it is the organization and classification of knowledge on the basis of explanatory systems that it is the distinctive goal of the sciences." Nagel, E. "The Structure of Science. Problems in the Logic of Scientific Explanation." 1961. p. 4. London: Routledge & Kegan Paul.

classical political economy represented by the central works of Adam Smith, David Ricardo and Karl Marx, classical economist and *the* critic of political economy. So my work is a theoretical, not historical, contribution. As Lakatos expressed it, the first step in a serious critique of a scientific theory is to reconstruct and to improve its logical and deductive articulation; a rational critique does not assume the existence of a fully articulated deductive structure, a rational critique creates it. So my Lakatosian inspired rational reconstruction seeks to re-create the deductive structure at the hard core of classical polical economy. I am not concerned with what exactly Smith, Ricardo or Marx, wrote, said, meant, thought, etc.; but with the common deductive structure of their works, what I will call, the theoretical system of classical political economy. It is by definition a constructive critique, so instead of focusing on the "mistakes" as Blaug suggests, I will look for the positive contributions to the general advance of economics as a science. The underlying thesis is that there is a lot more that unites than separates these thinkers.[13] I postulate that we learn more from what is common and systematic, than from the unsystematic differences between writers and schools. Of course, this methodological position is a clear extension of the "myth of induction" to the historiography of economics, if rational reconstruction is the goal, no amount of particular observations—and it does not matter how dusty, rare, cryptic and guru-like, they are—will support a valid generalization. Evidence of this can be found in some of the critiques to Samuel Hollander's enourmous volumes, that point out the things he left out! So, we do not need several hundred pages, but thousands, and it will never be enough...

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[13] Among historians and methodologists of economics this has been the minority view. Until recently for example, Samuel Hollander, the great British Historian of economic thought, has waged a "sustained campaign to establish the validity of a singular unified interpretation of the central tradition of British economic thought" through his massive studies of Smith, Ricardo, J. S. Mill, and Malthus, as well as in his general survey of "Classical Economics" (1987) Hollander has defended the so called "Continuity Thesis" running directly against the historians' of economics more or less accepted consensus. Within this minority view we also find writers like Michio Morishima that finds a clearly distinguishable strain of general equilibrium theory in classical economists, particularly in Ricardo and Marx. In the case of Marx and independently I found the same strain and developed it in my thesis "Patrones de Reproducción, Regulación y Crisis" Facultad de Economía, UNAM, 1981. Another recent attempt at the rational reconstruction of classical economics is the so-called Surplus Interpretation of Classical economics by Kurz and Salvadori, this writers however reduce the whole of classical economics to the particular Ricardian perspective. Among the most distinguished critics of this general approach are Mark Blaug, Peach and others. I suscribe in general terms with the 'more continuity than rupture' approach. My particular approach, however, is the

Within the inductivist perspective, there are always very important, crucial, fundamental—or the reader's preferred descriptor—texts, letters, influences, historical, political, familiar, etc., etc., factors that should have been considered. The road down the fallacy of induction is endless. Paraphrasing Lakatos, it is a matter of elemental logic, alas, not widely understood.

Lakatos saw clearly that it was impossible to understand the evolution of science or to have a totally descriptive historiography of science, without a philosophy of science, that is a history of science free of methodological considerations. Lakatos as well understood that a pure philosophy of science, that is an ahistorical, purely prescriptive methodology of science, was also impossible. This vicious circle can be expressed paraphrasing Popper: those who want to tell it like it is, will end telling it as it should be. Lakatos took as his maxim a paraphrase of one of Kant's dicta: "Philosophy of science without history of science is empty; history of science without philosophy of science is blind"[14] and tried to develop Popper's contributions into a "critical tool of historical research," that could turn this vicious circle into a virtuous one. I would say, economics without the history of economics, is empty. The history of economics without economics, is blind.

Lakatos sophisticated falsificationism[15] substitutes the concept of theory as the basic concept of the logic of scientific inquiry, for the concept of series of theories. What should be analyzed and appraised as scientific or pseudo-

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radical opposite of Hollander's, he tries to finds continuity through a painstaking search in the particular, an inductive approach. I do it at the highest level of abstraction.

[14] Lakatos, 1978, I, p. 102. See Blaug, 1997, p.31.

[15] This is Karl Popper's falsificationism, defined as: The methodological standpoint that regards theories and hypothesis as scientific if and only if their predictions are, at least in principle, empirically falsifiable; "naive falsificationism" holds that theories can be refuted by a single test—for example, a crucial experiment— "sophisticated falsificationism" holds that it requires a large number of tests to refute a theory. Lakatos develops Popper's contributions into what he calls "methodological falsificationism." Against Falsificationism, the methodological standpoint of *Verifiability* states that theories and hypotheses are scientific if and only if their predictions are, at least in principle, empirically verifiable. I will define as *Verificationism*, the a-critical adoption of the *Verifiability* standpoint, either in a deterministic or probabilistic form, without an explicit consideration of the induction problem; and, as *Vulgar Verificationism*, the reduction of the *Verifiability* standpoint to a particular form of inductive logic whatever its form. A sophisticated adoption of the *Verifiability* standpoint, should rest on the refutation of Popper's ideas and on an alternative to Popper's reformulation of the Humean problem of induction. I do not see this happening any time soon.

scientific is a succesion of theories and not a given theory. For Lakatos, and this is an idea reminiscent of the Kuhnian[16] concept of "normal science" such series of theories show a remarkable *continuity* so we can groupe them in a *research programme*. The *continuity* of a research program plays a vital role in the history of science and the central problems of a logic of science can only be analyzed within the framework of a *methodology of scientific research programmes*, MSRP.[17]

The core of Lakatos contribution can be expressed succintly as follows: theories and hypotheses cannot be judged in isolation, they belong in groups or sets of theories, theories are interdependent and can only be evaluated as they develop historically, either in a "progressive" or in a "degenerating" way. The proper form to evaluate a theory is as a part of a Scientific Research Program, SRP. The history of science is not the history of theories but the history of scientific research programmes, SRPs. These research programs are characterized by a "hard core" that consists of a set of irrefutable propositions by the methodological decision of its protagonists, plus a "positive" and a "negative" heuristics. The "hard core" is surrounded by a "protective belt" of auxiliary hypotheses, that can and should be tested. For Lakatos, Popper's falsifiability criterion is correct, but it is not enough, a scientific theory not only should be testable, but independently testable, that is, it should be able to predict an outcome that is not predicted by a rival theory. If a SRP accounts for all the facts predicted by a rival SRP and in addition predicts other novel facts as well, then it is considered superior. A SRP is considered *"Theoretically Progressive"* if succesive formulations contain *"excess empirical content"* that is, if the new formulation predicts "some novel, hitherto unexpected fact." It is *"Empirically Progressive"* if "this excess empirical content is corroborated."[18] An SRP is

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[16] See, Kuhn, T. S. "The Structure of Scientific Revolutions." Chicago University of Chicago Press. (1970)
[17] Lakatos, MSRP, P. 65. Ver. Esp.
[18] Lakatos, 1978, I, pp. 33-34. See Blaug, 1997, p.33.

considered as "degenerating" if, it is characterized by a continuous addition of ad-hoc adjustments to account for new facts.[19]

A fundamental criticism of Popper that underlines the Lakatosian proposal is the rejection of the positivist distinction between the "the context of discovery" and "the context of justification." This criticism is shared by Kuhn's sociopsychological theory in "The Structure of Scientific Revolutions" that introduced the hyper used and abused concept of scientific paradigms, as well as by the writers that advocate some kind of methodological pluralism if not open anarchism[20] as the only valid method(s) to develop science, if anything at all. Unanimmity ends here: there cannot be a pure ahistorical philosophy of science, and science cannot be fully understood without its context. At the very least the recognition of the reality of science as a social collective enterprise, where it is agreed that "scientific theories must be assessable in terms of observations that are at least in principle available to all observers"[21] necessarily introduces an evolutionary, historical, dimension in the philosophy of science.

The probiem, however, is how to deal analytically with this neccesary historical dimension, which is part but it is not all, that there is to the "context of discovery." Clearly Kuhn's conception of paradigm in terms of 'the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community" cannot provide a logical base, different than a descriptive one, to deal with this problem. Paradigms in the Kuhnian sense are intrinsically incommensurable. The standard interpretation of Lakatos's "hard core" as

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[19] Lakatos followers in what in my opinion is a fundamental misunderstanding, softened Lakatos's famous "novel fact" requirement and defined as a progressive SRP one that succeds more or less continually in making novel predictions, accounting systematically for new out of sample data.

[20] The most famous, but if not, by far the most interesting and entertaining is Paul Feyerabend "Against Method. Outline of an Anarchistic Theory of Knowledge." London N.L.B. 1975. Also, Polanyi, Michael. "Personal Knowledge. Towards a Post-Critical Phylosophy." 1958. London: Routlege & Kegan Paul. Speaking about the explosion of methodological pluralists, Paul Feyerabend in "How to Defend Society against Science" wrote "Kuhn's ideas are interesting but, alas, they are much too vague to give rise to anything but lots of hot air. Never before has the literature on the philosophy of science been invaded by so many creeps and incompetents. Kuhn encourages people who have no idea why a stone falls to the ground to talk with assurance about the scientific method. Now, I have no objection to incompetence, but I do object when incompetence is accompanied by boredom and self-righteousness."

[21] Blaug, M. 1997. p. 38.

essentially methapysical presents a similar problem. The most current interpretation is that of Kuhn[22]: Lakatos "hard core" is more or less the same thing as the Kuhnian paradigm. Within historians of economics this seems to be the prevailing view, the hard core expresses an idea virtually identical to Schumpeter's notion of vision: "the preanalytic cognitive act that supplies the raw material for the analytic effort."[23]

In my interpretation, Lakatos's hard core of a SRP should be seen mainly as a set of analytic propositions, a logical deductive structure that was developed slowly, through a long, preliminary, process of trial and error.[24] Lakatos refers to the basic fundamental theories at the heart of a SRP as the hard core.[25] Clearly this would lead us to a completely different definition of the "hard core" from that suggested above. Lakatos also speaks about the hard core as a methaphysical or irrefutable set of propositions or postulates, but distinguishes between programs with a methaphysical hard core and those with a refutable one. As he wrote: "La metodología de un programa de investigación con un "núcleo" metafísico no difiere de la metodología de otro dotado de un núcleo refutable excepto, tal vez, por lo que se refiere al nivel lógico de las inconsistencias que son la fuerza motriz del programa."[26]

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[22] Kunh in his "Logic of discovery or pyschology of research? Reflections on my critics." In Lakatos and Musgrave, 1970. Minimizes the differences between him and Lakatos: "Though his terminology is different, his analytic apparatus is as close to mine as need be: hard core, work in the protective belt, and degenerating phase are close parallels for my paradigms, normal science, and crisis." P. 256. Kuhn also recognized serious imprecisions in his use of the term "paradigm" and even suggested replacing the term *paradigm* by the term *disciplinary* matrix because it is composed of ordered elements of various sorts, each requiring further specification. "But whatever language is employed, the focus of his argument remains that of 'the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community" See Blaug, 1997. p. 28.

[23] Surprisingly Prof. Blaug, seems to suscribe to this view. See Blaug (1997). P. 34. Footnote 26.

[24] In a footnote Lakatos writes (From the Spanish translation): "El auténtico centro firme del programa no nace ya dotado de toda su fuerza como Atenea de la cabeza de Zeus. Se desarrolla lentamente mediante un proceso largo, preliminar, de ensayos y errores. En este artículo no analizo ese proceso." Footnote 161. "La metodología de los programas de investigación científica." p.67. Alianza Universidad AU 349. 1983.

[25] "La ciencia newtoniana, por ejemplo, no es sólo un conjunto de cuatro conjeturas (las tres leyes de la mecánica y la ley de gravitación). Esas cuatro leyes sólo constituyen el "núcleo firme" del programa newtoniano. Pero este núcleo firme está tenazmente protegido contra las refutaciones mediante un gran "cinturón protector" de hipótesis auxiliares. Y, lo que es más importante, el programa de investigación tiene tambien una heurística, esto es, una poderosa maquinaria para la solución de problemas que, con la ayuda de técnicas matemáticas sofisticadas, asimila las anomalías e incluso las convierte en evidencia positiva." Lakatos, Imre. La MSRP, Introducción: Ciencia y Seudo Ciencia. P. 13.

Unfortunately, Lakatos did not present us with a complete development of the above ideas, and the view of the 'hard core' as the purely methaphysical beliefs that unite the protagonists of a SRP has tended to prevail. This in turn entailed the failure to provide his methodology with the concepts that could make it a truly "critical historical" tool for the analysis of science. The dissapointment of many practitioners of different disciplines after an initial wave of enthusiasm expecting that a better methodology would help them to produce a better science, may be a result of this failure. However, the central problem still remains, such a "critical historical" tool is needed. If we look at the paradigm or at the hard core of a discipline as a purely methaphysical set of beliefs, it is impossible to compare a specific SRP with another, and I would say even to consistently define them, let alone to advise scientists about the progressive or degenerating character of a SRP, and hence to inform a decision about supporting or abandonning one program or another. Not to mention the impossibility to judge, on such grounds, if our discipline has progressed or not, and if we cannot do this how can we look ahead and propose future avenues of research to develop a particular science? Which are some of the questions that I believe, a methodology of science should be able to answer. Lakatos sketch for a methodology of scientific research programmes has the potential to do that. However, it needs substantial development. In my view Lakatos' MSRP has three main interrelated weak spots: first, the ambiguities in the concept of the hard core, second the concept of novel fact, and last but not least, and inextricably linked to the first two, the lack of a clear demarcation criterion of what is and what is not growth of science. In this essay, I will deal only with the first of the above, in the context of the rational reconstruction of the theoretical system[27], of classical political economy.

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[26] Lakatos, Imre. La MSRP, P. 59.

[27] A general definition that applies is that of Karl R. Popper, "The Logic of Scientific Discovery" in Spanish "La Lógica de la Investigación Científica" Ed. Tecnos, 1a. Ed. 1965. 7aReimp. 1985. En particular Capítulo Tercero, Teorías. Ap 16. 17 y 18. En este trabajo adoptamos la definición de sistema teórico como un sistema lógico de hipótesis científicas con una forma suficientemente definida y definitiva que sea imposible introducir subrepticiamente nuevos supuestos. "...el sistema de que se trate tiene que estar formulado de un modo tan claro y definido que se reconozca con facilidad que cualquier supuesto nuevo es una modificación, y, por ello, una revisión del mismo." Pp. 68. Es decir es un sistema lógico riguroso, sistema axiomatizado, formado por axiomas o proposiciones primitivas, de forma que todos los demás elementos

A well developed theoretical system is a deductive structure of scientific hypotheses with a form that is sufficiently defined and definitive that it is impossible to introduce a new assumption without modifiyng or revising the system. In other words the theoretical system has to be formulated in a clear and well defined way, so that every new assumption can be easily identified as a modification and hence as a revision of the system. It is a rigourous logical structure formed by axioms or primitive propositions, from which every other element of the system can be derived through purely logical operations. Of course, the use of some or other primitive propositions, does not imply a statement about their truth, or of their immediate empirical validity. In a theoretical system there is interdependence among its parts, and revisions of the system must allow us to observe how changes in the basic assumptions and propositions change the derived implications of the original system. If we recognize that at the heart of every scientific discipline, in a more or less explicit way, and in a more or less developed manner, lies a theoretical system that can be analyzed in strictly logico/analytical terms. Then, we can conceptualize the 'hard core' of a scientific research programme as containing not only a set of beliefs, values, visions, etc., that are analitically incommensurable; but also containing, or better said characterized by, an analytical part that is commensurable: the theoretical system of the discipline. Such a theoretical system corresponds to the "authentic hard core" in Lakatos: *"El auténtico centro firme del programa no nace ya dotado de toda su fuerza como Atenea de la cabeza de Zeus. Se desarrolla lentamente mediante un proceso largo,*

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del sistema teórico pueden deducirse por medio de operaciones puramente lógicas. Según Popper un Sistema Teórico desarrollado satisface los siguientes requisitos fundamentales: "a) El sistema de axiomas está *exento de contradicción*...lo cual equivale a que no es deducible del sistema un enunciado arbitrario cualquiera. b) El sistema es *independiente*, es decir, no contiene ningún axioma deducible de los restantes...Estas condiciones se refieren al sistema axiomático como tal: en lo que se refiere a las relaciones del mismo con el conjunto de la teoría, los axiomas han de ser, c) *suficientes* para deducir todos los enunciados pertenecientes a la teoría que se trata de axiomatizar, y d) *necesarios* para el mismo fin...no deben contener supuestos superfluos." Pp. 69. No está demás decir que el término axioma no implica que se les considere postulados de verdad, o verdaderos. En un sistema teórico hay dependencia mutua de sus partes, revisiones del mismo deben permitir observar como cambios en los supuestos primitivos afectan a las proposiciones derivadas y a su vez establecer las condiciones de falsación de las mismas. En un sistema teórico no todas las proposiciones o hipótesis tienen el mismo rango lógico y deben siempre ser consideradas a la luz del todo interrelacionado.

preliminar, de ensayos y errores." However, at some point in time, this authentic "hard core" can be considered "by the methodological decision of its protagonists" as irrefutable, that is as provisionally given. Every theoretical system comprises observational theories that provide us with "facts," and with explanatory theories that seek to explain those facts. In this sense facts are theoretical and theories are factual. What is a fact today can become a theory tomorrow. This are not fuzzy/vague distinctions or a fancy game of words like those so dear to the *new-new heterodoxy*[28], they are methodological decisions taken by scientists in the framework of a particular theoretical system. So they are personal only in the sense that we are persons, but they are essentially analytical decisions.

A theoretical system is an historical product, ergo it has evolved in one way or another and continues to do so; it reflects a 'vision', may mirror values and beliefs, ideologies, etc., etc. However, it is different from these elements. It is a logical construct and cannot be reflected directly in the world and can be, always provisionally, non testable. Ergo, it can be methaphysical in the wide sense of the word. Lakatos recognizes programs with a metaphysical hard core and others with a refutable hard core, that can be considered irrefutable by a provisional methodological decision. Unfortunately, he does not develop this point further. We can postulate that every discipline has a hard core with purely methaphysical elements that are simply not refutable: values, beliefs, visions, etc., and also an authentic hard core, a theoretical system, that is in principle refutable, but that can be considered as given by methodological decision. The more developed and the better articulated the deductive structure of the theoretical system, the more developed the discipline. The more developed a particular discipline is, the lesser the role of the purely methaphysical elements. The latter always and inevitably present, not only in science but in every human endeavor. The development of science should increase the sphere of rational discourse while diminishing the sphere of metaphysical argument. The rational

reconstruction of a discipline. should strive to make explicit, the implicit methodological decisions and assumptions, that characterize every theoretical system.

A theoretical system is a logical construct that captures some of the essential aspects of the reality, the domain, we are trying to explain. It can be argued that the logical structure of a theoretical system is the same as that of any theoretical model, even of a monotheoretical one, and yes, this is true. However, what distinguishes the theoretical system as the authentic hard core of the discipline, from other systems within is that the former is the simplest, but at the same time complete, representation of the domain of reality we are dealing with.[29] This view is at odds with Friedman's positive methodology of economics where the descriptive power of scientific theories is completely irrelevant. Before I am accused of pursuing Hilbert's programme in this essay, let me point out that there is no such a thing as a "complete" system[30], a "closed" system, and that the decisions regarding where the system begins, where it ends, and how to close it, the so-called "closure" problem, are very important and *inevitable* methodological decisions that should be explicited, unless we think it is possible to analyze everything at the same time[31].

Particular aspects of the selected domain should be explained in a manner that is logically consistent with the authentic hard core of the discipline. A

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[28] Among others, Dow, S., Chick, V. Gerrard, B. Fuller, S. et. al.

[29] The existence of a theoretical hierarchy within economics, has been expressed recently by Steven Rappaport through his distinction between "mini-theories" well defined deductive systems, and global-theory, which is a set of mini-theories, plus something else, for example methodological rules and an ontology. Rappaport follows Larry Laudan, a post-Lakatosian, stating that global theories are global statements that inspire or generate, mini-theories. Rappaport, Steven. "Models and Reality in Economics" 1998. Cheltenham, UK. Edward Elgar Publishing.

[30] Goedel showed that a single logical system was not enough to provide a foundation even for the arithmetic system, all consistent axiomatic formulations of number theory include undecidable propositions. Godel demonstrated that every logical system is incomplete, and just as it is impossible to lift yourself up by your own bootstraps, it is impossible to justify your methods of reasoning on the basis of those same methods. That is why we need a rational critical epistemology. For non mathematicians see for example: Nagel, Ernest and Newman, James R. "Godel's Proof" New York University Press 1958. And the well known classic Hofstadter, Douglas R. "Godel, Escher, Bach: An eternal golden braid. Vintage Books Random House New York. 1979 and Sept. 1980.

[31] Lakatos, I. "...no podemos expresar e incluir en nuestro modelo deductivo crítico a *todo* el "conocimiento básico" (o "ignorancia básica"). Este proceso debe ser fragmentario y en algún momento será necesario trazar una línea convencional." La MPIC P. 64.

particular theory, or set of theories, that deal with a particular aspect of the domain we are dealing with, should be logically deducted from the theoretical system. Of course, the former statement does not imply that scientific hypotheses can only be obtained through the deductive machinery, only that a true scientific hypothesis should be consistent with the system. The theoretical system cannot be, in principle, deducted from another deductive structure. It can however, be integrated into or with another theoretical system, then we are before a grand synthesis which implies the redefinition of the respective domains and related deductive structures. A theoretical system can also collapse, desintegrate and die.

Just as the particular theories that are its constitutive parts are created, the theoretical system of a discipline is created. It is not the result of a series of generalizations of numerous observations or of any conceivable mechanical algorithm, it is essentially an intellectual creation not that different from art. It is an act of *understanding* that nevertheless results in a product—the theoretical system itself—that has an interpersonally testable method of validating its assertions: deductive logic.[32] In this sense a theoretical system represents a

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[32] The use of the term *understanding* in the context of a Lakatosian proposal will cause some eyebrows to raise, so it requires some explanation. Prof. Blaug summarizes some of the old and the new objections to the Popperian/Lakatosian approach to the methodology of science: "The old objection is that of certain nineteenth-century German philosophers of the neo-Kantian school and revolves around the concept of *Verstehen* or "understanding." The new objection derives from some of Wittgenstein's later philosophical work having to do with the meaning of human actions, governed as they always are by social rules... The German term *Verstehen* denotes understanding from within by means of intuition and empathy, as opposed to knowledge from without by means of observation and calculation. The methodological difficulty with Verstehen doctrine is the same as that with the use of introspection as a source of evidence about human behavior: how do we know that a particular use of Verstehen is reliable? If we challenge a specific act of empathy, how will the empathizer validate his method? If the validity of the emphatic method can be independently established, it will usually turn out to be redundant." Prof. Blaug also refers to Peter Winch's *Idea of a Social Science,* inspired by some of Max Weber's work particularly the notions of ideal types that incorporate the meanings that human agents attach to their actions, to object the use of strict methodological standards in social sciencies: "The central strand in this brand of thinking is that meaning is not a category open to causal analysis and that, so long as rule-guided human actions form the subject matter of social inquiry, explanation in social science must not run in terms of physical cause and effect but in terms of the motives and intentions of individuals. In other words, the kind of knowledge appropriate to social enquiry can only be gained by coming to "learn the rules," and coming to learn the rules in turn entails knowing the phenomena from the inside, that is, having the experience of behaving in conformity with those rules. Thus the new objection to methodological monism ultimately blends into the old objection of Verstehen doctrine...we are offered no interpersonally testable method of validating assertions about rule-governed behavior." Blaug (1997) Pp. 43-44. Another variation of the same theme can be found in B. Gerrard analyses of Keynes where he uses hermeneutics as a tool of "understanding" in his analysis of Keyne's "General Theory" (1991) he writes about the hermeneutic circle: "To know the whole, one must

logical *description* of an elevated level of abstraction of the particular reality we are trying to *explain*. The more developed a science is, the more complete and systematic this description is. Relatively under developed disciplines have equally under developed theoretical systems or no systems at all, that is to say: they are characterized by a profusion of logically independent, that is not interconnected, 'theories,' 'laws,' 'hypotheses' and 'empirical propositions.' Conversely, well developed disciplines have equally well developed theoretical systems, characterized by fewer, more general and interconnected theories. The more developed a theoretical system is, the more testable hypotheses can logically be derived from it.

A rational reconstruction as defined, is an exercise in theoretical minimalism. It seeks to capture as precisely as possible a particular domain of the "real world," establishing the most important causal relationships among its constituent parts, and then logically deducing implications about the real world, that are, at least in principle, falsifiable. It is, to use the current buzzwords, an exercise in description, explanation and prediction. However, description is deductive not inductive, hence it is a theoretical description: all facts described are theoretical, and all theories are factual. Explanation takes place within the previously defined description. Description and explanation together, at the highest possible level of abstraction, and logically articulated in a deductive

need to know the parts. But the parts can only be known in the context of their interdependence within the whole. Thus to know the whole requires that the whole be preknown. In the narrow sense the text itself is treated as a whole, while in the wider sense the text is treated as part of the historical context." P. 283. For Gerrard economics is about interpretation understood as the process of dynamic interaction between understanding and explanation. In his "Human Logic in Keynes' Thought" (1992) Gerrard advances the "pluralist" idea that there are different types of logic, and that Keynes used in the General Theory an alternative logic, ordinary or human logic, instead of the classical logic, used by the classicals! Human logic generates knowledge that is imperfect, partial or vague, which is OK because that is the way the real world is! Well, everybody would agree that perfect knowledge is impossible, but to argue that science should be just as imperfect, partial,vague and fuzzy as the real world, is to abanndon the struggle before starting it. Another example of the strict application of the above mentioned principles of vagueness and fuzzyness as a virtue is "Formalism, Logic and Reality: A Keynesian Analysis" By Sheila C. Dow and Victoria Chick. Association Charles Gide Conference on Formal Models and Economic Theory: History, Analysis, Methodology. Paris, September 1999. (John M. must be turning in his grave.) Disassociating myself from these views, nevertheless I rescue the concept of *Verstehen, understanding,* as long as its product can be expressed in a logical structure at various levels of articulation, only then the fundamental valid objection to

structure constitute the theoretical system at the heart of a particular discipline. That is, the analytical or the "authentic" "hard core" from which we can derive, logically, implications about the domain of the real world that concerns us. Predictions that can be tested using any of the multiple research techniques available to the scientist. It should be apparent that not every discipline that aspires to be scientific has a theoretical system at its core. Only well developed sciences have such a pulsing heart, where the deductive machinery, by uncovering and eliminating inconsistencies, pushes knowledge ahead, sometimes... In not so well developed or relatively developed scientific disciplines, we can expect to find a coexistence of overlapping[33] theoretical systems, with alternative, but overlapping, descriptions of its domain and with competing explanations. Proto-sciences are characterized by the absence of theoretical system(s), and by the profusion of falsifiable hypotheses that are more or less supported by proto-theories—non-systematic general deductive propositions—and by the profusion of empirical propositions[34], that is propositions of the if/then type, without any theory whatsoever. Seudo-sciences are non-falsifiable forms of a proto-science.

I will argue that classical political economy constitutes a relatively well developed science with a common domain: the generation and the distribution of wealth, in the short and in the long-run; a relatively complete common theoretical system; characterized by two alternative explanations regarding the system's dynamic mechanism, that revolve around two different perspectives on profits and capital. These, I identify as: the Smithian and the Ricardian perspectives. It is my contention that contemporary economics is still fractured around this divide. The task of the next sections is to reconstruct the theoretical system of classical political economy.

Verstehen—we are offered no interpersonally testable method of validating assertions—can be overcome. The rest is still lots of hot air, as Feyereband expressed it.

[33] If there is no overlap, they are different disciplines.

[34] Empirical propositions are always important, they can generate proto-theories, new information conducive to *understanding*, etc., etc., but let us beware of the "myth of induction."

2. The Domain of Classical Political Economy: The Smithian and the Ricardian Perspectives.

The analysis of the conditions for the long term sustainability of alternative social modes of organization for the creation and the distribution of wealth, can be considered, from a contemporary perspective, the central theme of classical political economy as an emerging scientific discipline. So was proposed by the great classics[35] as an ensemble: Adam Smith's *Wealth of Nations* concentrated in the generation of goods and services as a measure of wealth and social wellbeing, positing a free market—that is individual producers and consumers interacting directly in the exchange of commodities, based on private property and competition—as the most conducive form of social organization to increase production. From an ethico-philosophical perspective, Smith saw in "the obvious and simple system of natural liberty" the solution to the moral problem of the compatibility between the selfish search for private gains and the common good, assuring the sustainability of the social order. If each man freely maximizes his own wealth, all men freely will maximize the nation's wealth. Smith argued against the 'mean rapacity, the monopolizing spirit of merchants and manufacturers' who were the architects and beneficiaries of the antithesis of the free market: the Mercantile System[36] where markets were controlled by a few in connivance with the state, in detriment of the social whole. Of course, as Smith himself insisted over and over in his writings there is nothing "natural" in free markets, to function effectively harnessing and chanelling selfish pecuniary motives, free markets required a very specific and strong framework of social institutions. David Ricardo defended free markets on the grounds that they would generate more and cheaper products for everybody, resulting in reduced production costs, positive profits for entrepreneurs that would sustain capital accumulation—the key to prosperity—and ultimately fend off stagnation. In the

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[35] The most representative in my view: Adam Smith "Wealth of Nations." David Ricardo "Principles of Political Economy and Taxation" Karl Marx "Capital."

Principles Ricardo focused in the problem of distribution of wealth among the labouring classes, the proprietors of land and the emerging capitalistic entrepreneurs. Ricardo taught, against Smith's belief, that the crucial problem of political economy was the understanding of the 'laws' that determined the distribution of wealth, for him there was not much interest in the problem of the creation of wealth. In the long run, as long as markets where free, output would expand to its maximum possible as determined by the fecundity of earth, the costs and productivity of labor, under these circumstances the complete product would be distributed to landowners in the form of rents and to labourers as wages. Here Ricardo is in line with Smith's ideas. However, in the short run Ricardo saw the essential problem in the determination of the rate of profits, a distributional question, which would determine the level of capital accumulation, hence employment, hence output and wealth. Karl Marx considered that Smith's "obvious and simple system of natural liberty" was a myth, an ideological construct. He saw in the reality of the XIX Century world a social mode of organization of production and distribution based on the existence of antagonistic social classes, capitalists that concentrated wealth and political power and labourers forced to sell their work to survive with a minimum say regarding their living conditions, what he termed the capitalist mode of production[37]. A reality that was completely at odds with Smith's desired system. The capitalist mode of production was for Marx, one in a series of several modes of production, through which human societies had evolved over time, a mode of production with an historical beginning and eventually with an historical end, just as every other previous mode of production. Marx postulated that the capitalist mode of production was not sustainable in the long-run and carried within the seeds of its own demise. Marx's purpose was to discover the historical laws of motion of the capitalist mode of production, which in his materialistic view resided in the "sphere" of the production and the distribution of wealth. To achieve this goal, Marx used the analytical framework of Political Economy, developed by the other

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[36] For the historian Fernand Braudel what Smith defines as the Mercantile System is the capitalism of the time. Braudel, Fernand. "Civilization & Capitalism 15th-18th Century. Vol. 3. The Perspective of the World. Harper and Row. 1979.

great classics particularly by Ricardo, but enmeshed in a Hegelian dialectic philosophy. This, he termed as, the Critique of Political Economy.

The original focus of classical political economy on the wealth of nations, that is the capacity to generate more and better goods and services for the population, required an analysis of the long-term dynamics of economic development. The volume of output, was considered to be an adequate measure of wealth, that is of economic development. The more production of commodities the better. The distribution of output was considered to be mostly affected by forces outside of the economic system. The economic problem, how is wealth created and distributed, was seen as a contrast between given natural resources, land, and augmentable labor and capital, within a certain institutional framework. Capital was conceived in physical terms as a stock of intermediate goods, often just subsumed to labour, and/or as a set of physical means of production, distinct of, but with an always problematic logical connection with money. Technology was expressed as a relationship between labor and physical capital, so in the long term, the volume of production or output, given the quality and quantity of natural resources, was dependent on the volume of accumulated physical capital. Capital accumulation was a function of profits and/or the rate of profits. The problem of distribution was dealt with through special theories of population, wages, rent, surplus value, interest, etc., mainly from outside the system of production and considering as given the institutional parameters of the time. In short, the core of classical analysis concerned itself with the production and distribution of wealth and focused on the relationships between profits, capital accumulation, production and population growth, to explain the dynamics of the system. All of the above in an institutional setting characteristic of a competitive private enterprise economy. This is the domain of classical political economy.

The growth of wealth over time, was a major concern for the classics. The rate of growth of output was considered a function of the rate of profit on capital,

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[37] Marx never used the term capitalism.

so the distribution of the surplus or net product over time, as well as the determination of the rate of profits and wages played a key role in the secular process. For the classics, the determination of the distributive variables, rents, wages and profits, went hand in hand with the determination of the rates of exchange between different goods and services, that is with the relative prices or the value, of commodities.[38] Thus a theory of value and a theory of distribution were essential for the understanding of the long-term development of a modern economy. In this respect the classical political economists incorporated population theories to analyze the effects of changes in the quantity and quality of the labor force and of wages, on the distribution and on the rate of growth of aggregate output. Nevertheless, the different particular theories of value and of population, were auxiliary tools for the study of the generation and distribution of wealth. They were not the main analytical object. Competition was studied like a process where profit-maximizing and/or cost-minimizing independent entrepreneurs seeking to maximize the value of their capital, would end up increasing output and establishing relative prices that in the long run would correspond to 'natural prices' or to prices of production. In general, competition was desirable because it enlarged the market by improving the division of labor and by reducing prices to costs, not to mention the libertarian aspects that it entailed regarding personal freedoms, partcularly for Smith and Ricardo. From the Marxian perspective competition was an expression of the essentially conflictive nature of the capitalist mode of production. Individual capitalists were forced to wage commercial and industrial wars against each other in order to survive as capitalists. This was reflected in the processes of concentration and centralization of capital, that would cause continuous upheavals in production, but also would push the development of "productive forces" and the expansion of markets to levels never seen before in the history of mankind. Marx praised the progressive effects of competition on long term development, for him this was the setting for the future revolutions in the most advanced capitalist nations. For the

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[38] Not everybody will agree strictly with this assertion, but it can be argued that they did with different degrees of emphasis as far as the interdependence of the theories of value and distribution. Modern Neo-

clasics, under competitive conditions entrepreneurs could not establish prices, they would be established by the market—that is by a mechanism free of any individual control—and in the long term, in equilibrium, prices would gravitate to their 'natural' levels as determined by minimum costs of production, usually conceived as the technically possible minimum physical resources used in production, inclusive of the costs of physical capital and/or the general rate of profits on capital. As we will see, it is in the conceptualization of profits where the main divide of classical economics is to be found.

If the analysis of the long-term development of modern economies was the central preocupation of classical economics, then the consideration of the secular trends of capital accumulation was an obvious implication. Smith and Ricardo, shared an interest in discovering and explaining the secular growth trends of competitive private enterprise economies. They also shared a pessimistic view about their possibilities of permanent growth and expansion, they saw an eventual future of stagnation. For these classics the long-term sustainability of modern economies was inextricably linked to the evolution of profits on capital. For Adam Smith, growth would eventually die down because of an excess of capital relative to profitable opportunities which would drive down profits and hence stop capital accumulation, unless new markets were opened and new products were continuously developed, a possibility that Smith did not consider as very likely. For David Ricardo, the scarcity of natural resources would in time push up rents to a point where actual profits would not justify additional investments. A process that could be slowed down by technical progress and foreign trade but that, in his view, will ultimately take over. In summary, Smith and Ricardo saw in the long-term a stationary situation, a no growth economy where only the existing (physical) capital was maintained and no more capital was accumulated, profits would dry out. As *the* critic of Classical Political Economy, Marx did not considered himself an economist. His goal was to uncover the laws of movement of the capitalist mode of production to understand

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Ricardians in the Sraffian vein, argue that Value and distribution can be dealt with, in a completely

the mechanisms of its eventual demise. A demise that was for him inevitable, due to his particular Hegelian view of history: that is history with an end, a pre-ordained end. In Marx, not only capital accumulation would eventually stagnate, but the capitalist mode of production would collapse opening the doors of history for a new society: the socialist mode of production. In his conception as capital accumulates labor is incorporated to production, causing unemployment to fall and wages to rise until profits would fall and cause investment to falter, bringing down employment and wages with it. The expansion of the so-called "industrial reserve army" would push wages down until profits would grow enough to restart capital accumulation again. This short term mechanism of the "class struggle" economic cycle, would be compounded by a secular trend of the rate of profits on capital to fall with the increased mechanization of industry, the so called "Law of the Falling Rate of Profit." Together the class struggle coupled with the inevitable fall of profits, due to mechanization or as Marx expressed it, due to the increase in the organic composition of capital, would stop growth. The accumulation of capital would collapse and the resulting crisis plus the revolt of the politically organized labouring masses would bring capitalism down. So the Marxist story goes.

In general for the classics, if profits were central to the long term dynamics of modern economies, then the distribution of the net product between rents, profits and wages, was a crucial element to be explained. To explain distribution the classics needed to explain the relative prices, the value, of the remunerations of land, labor and capital. Wages were determined in the long run by the costs of production of the means of subsistence interacting with changes in population, within given historical conditions. Land rentals were determined by the different qualities and quantities of available land or natural resources. Rentals would emerge as differential surplus over marginal costs of cultivation, given natural fertility and technology. There are no essential differences in the different theories of wages and rents present in the works of the major founders of the

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independent manner, considering this approach as the truly classic way. See section ___ of this chapter.

discipline. However, with respect to the theory of profits and hence with the theory of capital and the rate of profit, there are two essentially different approaches with direct logical consequences for the whole theoretical and practical body of the discipline until the present time.

The classical theoretical system in dealing with the production and distribution of wealth confronted the problems of value, distribution and the long-term dynamics of modern capitalist economies. These problems required the elucidation of the nature of profits, capital, the rate of profit and the determination of its long-run trends. To do so the classics implicitly used the model of a pure free market, perfect competition in modern parlance.[39] In the free market logical world individuals owners of commodities would trade commodities for commodities, obtaining the same value in exchange as the value they brought to the market. The theoretical problem confronted by the classics was: How to explain the emergence of profits if trade was conducted strictly in terms of equivalent values? If prices were natural prices, that is equilibrium long term prices, resulting from the workings of a free market economy where by definition trade is conducted at fair, that is equal, values. If all commodities were traded according to their equilibrium values, how was it possible that a surplus value could appear? It should be apparent that this logical problem needed to be solved without leaving the assumptions of equal exchange, that is pure competition. For Marx the dividing line between classical economics and vulgar economics, was right here: The classical economists would solve the problem of the emergence of profits under conditions of exchange at market values, that is in conditions of long term competitive equilibrium, vulgar economists[40] would not. Of course, as Walras would realize in time, this condition: all commodities are

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[39] Marx also worked implicitly within a perfect competition and general equilibrium approach, clearly shown in his models of the 'simple exchange of commodities,' in the reproduction schemata and in the transformation problem. He would say without the assumption that the sum of prices equals the sum of values and that the sum of profits equals total surplus value, political economy is without a rational foundation.

[40] For Marx, Malthus was the paradigm of this species. Ricardo was no so symphatetic either. In a letter from Ricardo to James Mill 1st of January 1821, referring to Malthus, he writes: "Political Economy he [Malthus] says it is not a strict science like mathemathics, and therefore he thinks he may use words in a

traded strictly on an equal value basis, implied the acceptance of Say's[41] law of markets, that is supply creates its own demand, it entailed as well a general equilibrium approach. It also implied, as we will see, the consideration of money as a medium of exchange only and hence the validity of the classic quantitative theory of money. The classical economists by establishing as the central principle of their theories of value, the condition that exchanges take place strictly in terms of equal values, implicitly but necessarily adopted a pure competition and general equilibrium approach, where Say's law emerges as irrevocably valid. And so it is, within this framework, the quantitative theory of money in its simplest form: money as a unit of account only. It is within this theoretical system that answers to the classical problem of the emergence of profits can be grouped around either one of the two perspectives on the issue: Profits as a real cost, the *price* of capital, in the Smithian tradition. Or profits as a residual after costs, in the Ricardian tradition. These two perspectives share a common analytical framework, however the different concepts of profits and capital that distinguish them, imply radically different conclusions in terms of the short and long term dynamics and sustainability of modern economies.

In the case of Smith the rate of profit is seen as a price, the price or the cost of capital, dependent on the supply and demand conditions for it, just as any other commodity. Capital in Smith is conceived ambiguously as an original factor of production in physical terms, a wage fund or as a stock of loan-able funds in value terms. The rate of profit is also ambiguously assimilated to the "interest rate" on "liquid" capital. In the case of Ricardo and Marx, the profits accrued to capital were considered as a surplus or as a residual left over from the total net output after paying rents and wages, that was appropriated by the entrepreneur or the capitalist that had control over the production process. Capital in Ricardo and Marx is considered as a stock of commodities used for production, means of

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vague way, sometimes attaching one meaning to them, sometimes another and quite different. No proposition can be surely more absurd." Kurz and Salvadori, 2002, Footnote 2.
[41] After Jean Baptiste Say.

production consistent of fixed and circulating capital including wage goods.[42] That is a stock of physical goods. Marx also stressed the question of capital as a 'social production relationship,' that is, a property right socially and historically determined that gave the owners of 'means of production' the control of production and distribution. Marx distinguished between money as money—just a medium of exchange—and money as capital, introducing but never developing in a satisfactory way the question of capital as something different from a thing, a set of produced means of production, and also different from money.

Marx, "solved" the problem of the emergence of profits in an equilibrium where every commodity is traded strictly according to its labor value, by introducing a special commodity: the labor force. The labor force is traded in strict accordance with its value in exchange: that is the socially determined wage in terms of the labor value of wage goods. But the labor force is a commodity that has a unique value in use, it creates value. For Marx, it was the only source of value. Given that in capitalism laborers did not own means of production, they were forced to sell their labor force to the owners of means of production which where in a position to force the working class to work for more time, than the time necessary to pay for wage goods. This surplus labor time was the source of the surplus value appropriated by the capitalist: the owner of the means of production and the exploiter of the working class. The ratio between the surplus value and the value of the wage goods, was defined by Marx as the rate of exploitation which depended mainly on the relative political power of the workers vis a vis the capitalists. Marx determined the rate of profit in physical terms as a ratio of the surplus value over the value of fixed (constant) capital plus, the value of the wage fund (variable capital), all measured in terms of 'abstract' labor hours. Over time the value of fixed capital will grow faster than the surplus value and the profit rate will tend to fall. By the introduction of such an ad hoc

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[42] As is well known Marx's distinguishes between 'constant' and 'variable' capital, where variable capital includes only wage goods, and is the 'only" portion of capital thah creates new value because it is used to buy the only source of value, the labour force. However, this distinction, fundamental for the Marxist theory of surplus value is irrelevant for our purposes.

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hypothesis, the special commodity, Marx sided with his theoretical adversaries, the so-called vulgar economists.

The Ricardian analysis of profits presents two different scenarios, first the long term equilibrium where output reaches its maximum as determined by the amount of accumulated capital, considered equal to the wage fund so employment is determined by prevailing technological conditions, where profits as a residual dissapear and the complete product is distributed between rents and wages. This scenario implies full employment of capital only, but can include a Malthusian population mechanism that results in the full employment of labor as well. This scenario is equivalent to the long term Smithian equilibrium, however in the Ricardian conception of profits as a residual, the level of profits is zero, while in the Smithian version would be equal to the long term or "natural" price of capital. The second Ricardian scenario, which I have termed short-term, consists in considering the level and the composition of output, that is of aggregate demand, as given, then we can have positive profits as a residual.

To consider profits as a residual, in a short term Ricardian fashion, implies that the total product is determined by technological conditions only, given the level and the structure of demand. It also means that the rate of profit is a technical result obtained by simply dividing the residual or surplus over total costs, in a single good world, the case of the economy as a giant farm. In multiple good economy, the determination of the rate of profits can be achieved by using the appropriate measuring units and dimensions, that is with a consistent theory of value, something that Ricardo never developed but Sraffa eventually did. In Ricardo profits are a residual part of a physical surplus generated in production. Prices within the Ricardian short term perspective should reflect costs, labor and natural resources, plus a uniform general rate of profit. If profits are not a residual but a cost, á la Smith, a cost that corresponds to the natural reward for a factor of production; then, the normal prices of final products are simply the addition of the quantities of labor, land, and capital used

in production, valued at their normal rates. The total product then is equal to the sum of all individual prices and is equal to the sum of the total wages, rents and profits. The latter is the Smithian result that most puzzled David Ricardo. If the total output of an economy was a function of accumulated physical capital and the level of employment, given natural resources and technology, then the total product should be determined independently of the prices of its components. In Smith, if wages, rents and/or profits change, prices will change and total output will vary. In Ricardo's conception of total output and of capital as a set of physical commodities, prices are a measuring device and should not affect the magnitude of what is being measured. Hence the need for a theory of value that is independent of distribution and Ricardo's search for an invariable measure of value. Initially Ricardo avoided the relative prices problem by assuming an economy with a single good, i.e. corn, as the only input and output of the system. To address the reality of an economy with multiple goods, he developed a labour value theory: the relative prices of commodities are determined by the amount of labour employed in their production, including the labour embodied in the means of production. His goal was to develop a theory of value where changes in the distribution of output did not affect the relative prices of commodities and hence the value of total output. He was never able to solve this problem himself.[43] Marx offered a solution in the so-called transformation of values to prices, where production prices, equilibrium prices, differ from labour values and consist of the costs of constant and variable capital plus a general, equal, rate of profit determined by competition among capitalists. However, in this formulation cost of

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[43] Ricardo's identification of the 'invariable measure of value' with the commodity produced with average composition of capital made Sraffa conclude that: "This preoccupation with the effect of a change in wages arose from his [Ricardo's] approach to the problem of value which, as we have seen, was dominated by his theory of profits. The 'principal problem in Political economy' was in his view the division of the national product between classes and in the course of that investigation he was troubled by the fact that the size of this product appears to change when the division changes. Even though nothing has occurred to change the magnitude of the aggregate, there may be apparent changes due solely to changes in measurement, owing to the fact that measurement is in terms of value and relative values have been altered as a result of a change in the division between wages and profits." Thus the problem of value which interested Ricardo was how to find a measure of value which would be invariant to changes in the division of the product; for, if a rise or fall of wages by itself brought about a change in the magnitude of the social product, it would be hard to determine accurately the effect on profits." (Sraffa 1951, p. xlviii-xlix). Sraffa, Piero. (1951), "Introduction", The Works and Correspondence of David Ricardo. Vol.I, ed. P. Sraffa. Cambridge: The University Press.The first logically consistent solution to this theoretical problem at the expense of the labour theory of

production prices should also include a general rate of profits not pure labour values, so prices depend on the general rate of profits, ergo on distribution and on the prices of accumulated means of production. As Ricardo's, Marx's formulation was also logically inconsistent.[44] These shortcomings, among others led to the abandonment by everybody, well maybe some lost fundamentalists still argue about it, of the labor value theory of Ricardo and subsequent reformulations by Marx. Nevertheless, the fundamental question from the Ricardian perspective, the consideration of the nature of profits as a residual not as a cost, is independent from the labour value theory in its different versions. For Smith the determination of all prices, including the rate of profit as the price of capital, falls within the realm of value theory and is independent, caeteris paribus, from the distribution of output. The participation of profits in total output, depends on the price of capital and on the amount of capital employed in production. Or to express it more precisely, within the Smithian tradition, distribution theory is a special case of price theory, given the technical conditions of production.

With respect to capital, the classical economists' theoretical system shares at the most essential level the conceptualization of capital as a set of physical heterogeneous objects, the means of production, the commodities employed in the production of other commodities, paraphrasing Sraffa. Commodities that come from the past and that can be accumulated to produce more commodities. Commodities with a value that, so they tought, could be obtained by simple aggregation of the prices of production of the means of production, which proved to be a quite difficult thing to do and one of the central theoretical and practical problems of the discipline until present times. Of course, in the writings of Smith,

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value was offered by Piero Sraffa in his book "Production of Commodities by Mean of Commodities: Prelude to a Critique of Economic Theory" 1960. Cambridge: The University Press.

[44] The Sraffian and Post-Sraffian critique of the neoclassical theory of capital, demonstrated that there was not a simple direct relationship between the quantity of capital employed in production and the return on capital—rate of profits or "marginal product of capital"—changes of techniques from low to high and viceversa, intensity of capital, could result in movements in the rate of profit contrary to those predicted by the neoclassical theory of capital as an homogeneous aggregate. This is the phenomenom of re-switching and proved the inconsistency of the marginal productivity theory of distribution. The re-switching phenomenon applies, except in very restrictive conditions, also to labour as an homogeneous aggregate.

Ricardo and Marx we find different approaches and contradictions in the understanding of capital. For example, as we have mentioned: Smith's central idea of capital as a stock of intermediate goods that permits the producer to sustain production until final goods are sold in the market, conflicts with the idea of capital as a fund of purchasing power that perpetually returns more purchasing power to its owners, which comes nearer to a conception of capital as money yielding interest. Of course, if capital is a set of commodities how can we solve the problem of the determination of the 'natural price' of capital as something distinct from the prices of the commodities that constitute capital? Ricardo tried to clarify this problem with his analysis of the single good economy—an analytical construct that with hindsight we might say has contributed more to confuse than to clarify the study of modern economies. In the world of the economy as a giant farm where corn is the only input and output, capital is a physical magnitude of 'corn' measurable in physical units, say tons, and arbitrarily valued with whatever unit we wish to use, say 1 ton = 1 dollar or x pesos or y euros, etc. With this approach we "solve" the problem of the heterogeneity of capital and of the determination of its value by assuming it away. As is known, the logical puzzle of the determination of the rate of profit and hence of the value of capital as a set of heterogeneous commodities, á la Ricardo, has a solution and it is the Sraffian solution, which dispenses with the labour value theory(ies),[45] but it is forced to assume as given the level of aggregate output and demand, otherwise in the Ricardian logic profits are zero. However, the problem to start with, is if the Ricardian puzzle is the correct one, when we are interested in the dilucidation of the real world dynamics of modern capitalist economies. Which I think it is not.

Marx also starts and mainly stays within the tradition of capital as a set of heterogenous means of production with a value determined by aggregation based on the labour employed in their production. Marx, just as Ricardo, when he

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[45] The Sraffian solution determines the prices of all individual commodities and, either wages or the profit rate, one of these variables needs to be determined outside the production system. Sraffa opts for the determination of the rate of profit, through the interest rate as determined within the financial system, a process that is not analyzed. By doing this Sraffa eliminates capital from production, with the implication that

was confronted with the fact that in a competitive private enterprise economy capital is remunerated proportionally to its value[46], or in other terms, that capitalists obtain in equilibrium the same return over the value of their capital across the economy, was not able to develop a consistent theory pertaining the value of capital as something distinct of the aggregated value of the things that are used as means of production and that has a unique price, equal to the economy's rate of profit. Nevertheless, Marx did touch upon some of the central unresolved problems of capital theory, for example: capital as abstract purchasing power, when he writes about 'money as capital'; capital as an entitlement, when he stresses that capital is not a 'thing' but a 'social relationship of production'; and about what some contemporaries term as capital effects, when he discusses the role of the processes of 'the valorization of capital,' "super-accumulation of capital' and the 'destruction of capital', in the dynamics of capitalistic crises[47]. Nevertheless, these relatively isolated references, unfortunately often obscured by ideological rantings are far from a consistent theory of capital and do not constitute a break with the essential caracterization of capital in physical terms characteristic of the classical theoretical framework. The Marxian rupture with the classics, takes place outside the theoretical system of classical political economy, and belongs to the realm of politics, ideology and history.

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the Sraffian system does not have room for any theory of capital at all! Classic Walrasian and contemporary general equilibrium analysis, share this fundamental problem.
[46] In Smithian terms that the natural price of capital measured as the rate of profits, is one and the same for all economic activities due to competition in the market for capital.
[47] See K. Marx. "Kapital" Vol. III. Pp. 253-54. (Ed. FCE, Spanish Version)

3. The Theoretical System of Classical Political Economy.

In the methodological section of this essay I defined the concept of theoretical system as the "authentic hard core," to use a Lakatosian expression, of a scientific research programme. In a relatively well developed scientific discipline this "authentic hard core" is the simplest but at the same time complete[48] analytical description of the domain of a discipline. It is a deductive structure of a high level of abstraction, provisionally it is postulated that it cannot be deducted from another structure. A theoretical system is a logical system of scientific hypotheses with a form that is sufficiently defined and definitive that it is impossible to introduce a new assumption without modifiyng or revising the system. In other words the theoretical system has to be formulated in a clear and well defined way, so that every new assumption can be easily identified as a modification and hence a revision of the system. It is a rigourous logical system formed by axioms or primitive propositions, from which every other element of the system can be derived through purely logical operations. Of course, the use of some or other primitive propositions, does not imply a statement about their truth, or of their immediate empirical validity. In a theoretical system there is interdependence among its parts, and revisions of the system must allow us to observe how changes in the basic assumptions and propositions change the derived implications of the original system.

In the previous section the domain of classical political economy was presented. A simple formalization will help to clarify the previous arguments through the rational reconstruction of the common deductive structure that captures the most essential aspects of the classical theoretical system. The goal is to identify clearly the different analytical perspectives that are derived from it concerning profits, capital, the determination of the profit rate and its trends; as

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[48] One more time, completeness is a methodological decision with a clear unavoidable element of conventionalism. Every system is by definition incomplete, the decision to close it at some point or another, has logical and theoretical implications. What is important, is that these decisions or assumptions are transparent and their modification is recognized as a revision of the system.

well as its relationship with the production and distribution of wealth. This will allow us to deal from the classical perspective with some of the core theoretical problems of selected contemporary research programmes.

Consider an economy with given labor, land and physical means of production, capital, resources that are used for production with a given technology. The wealth of the economy is represented by the total output of commodities, all tradeable goods and services. In the spirit of the classics we assume an economy with private property where exchange takes place in equal value conditions and individuals seek to maximize their wealth. In other words, we assume free market conditions or pure competition in modern terms.

Y = Wealth (Total output of commodities)[49]

T = Land (All non-Reproducible Natural Resources)

L = Labor (Homogeneous or Reducible to same type)

K = Capital (Conceived physically as produced means of production)

Total wealth would equal the aggregate income of the owners of the resources employed in production or of the classes involved in the productive process, where:

R : total rents received by the owners of land;

W : total wages received by labor, including managerial wages;

P : total profits accrued to the entrepreneurs or capitalists in control of the
    production process.

The associated distributional variables are:

r = Rent (Rate per unit of Land)

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[49] At this point of the analysis we can abstract national accounting considerations.

w = Wage (Rate per unit of Labor)

π = Rate of Profits

And,

$Y = rT + wL + \pi K$

where:

rT = R ; total rents

wL = W ; total wages

πK = P ; total profits

So

$Y = R + W + P$

That is, total wealth or production is equal to the sum of all forms of income, demand equals supply.

The Smithian perspective approaches the determination of total output Y, through a supply and demand analysis of independent markets for every individual commodity and for land (T), labor (L), and capital (K), which respond to the demands of self interested individuals acting as consumers and producers, who want to obtain the most out of their resources. Of course the demand for land, labor and capital, is derived from the demand for commodities in general, however every demand for a particular commodity is a demand for the resources needed to produce it, and commodity prices ultimately reflect the prices of the resources involved in its production. When the price of a commodity is either above or below its natural price it means that the land, labour or capital employed in its production is being remunerated above or below its natural level. If, for

example, capital is obtaining more profits in a particular activity than in the economy as a whole, the most profitable activity will attract more capital until profits will descend to its normal levels again, and the price of the particular commodity will go down as well. The exact same argument applies, of course, to labor and wages. As profits and wages vary, so will rents until, every type of land, that is, of natural resources, yields for her owner its natural level.

In Smith the price of an individual commodity, Y_i , is equal to the necessary resources employed in its production, that is T_i ; L_i ; and K_i , determined by technological conditions, times their market prices:

$$Y_i = rT_i + wL_i + \pi K_i$$

Obviously,

$$Y = SUM\ i = 1\ n\ Y_i$$

And

$$Y = R + W + P$$

In each individual market for a commodity the quantities and prices demanded and supplied, will vary affecting the demand for the resources required to produce it, these changes will affect the markets for labor, land and capital. If the price of a commodity is above its cost of production, producers will tend to increase its production and hence augment the demand for the original factors of production and, to express it in textbook terms, will push their prices up. If the price of a commodity is below its production cost, the use of productive resources in that activity will be reduced and their prices will tend to fall. Ultimately commodity prices will be fixed at the level where costs of production in terms of land, labor and capital are exactly covered. Clearly the prices for land,

labor and capital, determined in independent markets by independent forces should also vary until a natural or, in contemporary terms, equilibrium price for land in the form of rents, for labor as natural wages, and of capital as the natural rate of profit or interest, ($\underline{r}$, $\underline{w}$, and π) is established.

The forces governing the dynamics of each one of the original markets are explained by special theories as we saw, but in general, the level of rents, wages, interest or profits, is seen as reflecting the usefulness, demand, and the scarcity or supply, of the particular 'factor'. At a certain moment in time, the supply of the original factors is considered as given, land by the generosity of god, labor by the laws of population and accumulated capital by the thrift of its owners, the supply of capital is the result of the saving decisions of individuals that abstain from consumption, the natural price of capital is their remuneration. The natural or equilibrium prices of particular commodities will reflect exactly the amount of resources (T_i, L_i, and K_i), technically determined, employed in its production times its natural prices ($\underline{r}$, $\underline{w}$, and π). That is, for commodity, i, its natural or equilibrium price is:

$$\underline{Y}_i = \underline{r}T_i + \underline{w}L_i + \pi K_i$$

For all individual commodities, the natural equilibrium price would correspond to the cost of production, so it will be a minimum price, and given that when the natural prices of 'original factors' are achieved its supply is the maximum attainable, total output is a maximum too. These are the positive social welfare effects of the Smithian 'Invisible hand theorem'. Of course, Adam Smith did not state it this way, but the only logical level of output equilibrium is determined at "full employment" and it is a result that implies a 'general equilibrium,' that is the price of a commodity corresponds to its natural level, if an only if, when all the commodities and the necessary resources to produce them, have reached their natural price level. And if profits are to be positive at this point, logic forces us to consider them as a cost, the cost of capital, otherwise we

are at the Ricardian long term equilibrium where profits as a residual are zero. However, neither Smith or his followers have provided us with a satisfactory theory of, π , that is, of the determination of the natural level of profits as the cost of capital. Of course, within this view a central problem remains unsolved, if capital is a set of commodities, the means of production, the prices of individual commodities should be determined the same way as every other commodity, that is by their cost of production. So we have two inconsistent capital pricing mechanisms: one for capital in general, the price of capital or the rate of profit or rate of interest; and another, that determines the price of every commodity, including the means of production that constitute capital, based on the cost of producing them or it. The logic of the classical theoretical system cannot accept both. Here is where we can find the roots of the many versions of the debates about the market interest (or profit) rate and the natural interest (or profit) rate, usually considered a Wicksellian theme but, that as we can see is already implicit in the Smithian perspective. The facile argument that capital is money and that the natural price of capital is the interest rate, cannot be logically integrated to this perspective. For the obvious reasons that capital is defined as the set of physical means of production; and because money is considered only as a unit of account, and as such, it is intrinsically valueless.[50] The economy in the classical system is essentially a non-monetary economy. The reference to the financial markets as the place where the interest rate, and hence the profit rate is determined, without a logical integration of money and capital markets to the workings of commodity markets is simply not enough.

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[50] Well, maybe it is clear, if not obvious, once you look at this problem from the perspective of the classical theoretical system as defined. However, it was until Frank Hahn in a seminal article "discovered" that the equilibrium value of money was zero, that this theoretical fact began to be widely recognized. See Hanh, F. H. "On some problems of proving the existence of an equilibrium in a monetary economy" In *The Theory of Interest Rates* F. Hahn and F. Brechling, eds. 1966, Macmillan, London and Basingstoke. Prof. F. H. Hahn of Cambridge UK, put forth the novel at the time suggestion that money may be worthless: Money is characterized by the quality that is desired for what it will buy. If, for some reason, it were worthless, it could not be valuable in this way. Hence there would be no excess demand for it. But this means that the nil value in exchange is an equilibrium "price" of money. There is an equilibrium where the economy is effectively demonetized; it no longer appears to be a monetary economy. See also, "General Equilibrium Models of Monetary Economies" Studies in the Static Foundations of Monetary Theory" Ed by Ross M. Starr. Academic Press, Inc. Harcourt Brace Jovanovich, Publishers. 1989.

David Ricardo's analysis presents a definitive ambiguity regarding the determination of wealth, or total output, as it is well known his main interest was the determination of the distribution of wealth, and in various instances he remarked that the determination of total wealth was not really possible. For example, in a letter from Ricardo to Malthus, Kurz and Salvadori find the following statement: "Political Economy you think is an enquiry into the nature and causes of wealth—I think it should rather be called an enquiry into the laws which determine the division of the produce of industry amongst the classes who concur in its formation. *No law can be laid down respecting quantity, but a tolerably one can be established respecting proportions.* Every day I am more satisfied that the former enquiry is vain and delusive, and the latter only the true objects of the science."[51] In this quote from Ricardo we find a quite disturbing idea of rigor and analytical precision: How can you established the proportions into which something that is 'vain and delusive' can be divided? Only by assuming you know the whole to be distributed. Which is exactly what Ricardo did in order to be able to consistently determine a positive rate of profits.

As we said the Ricardian analysis of profits presents two different scenarios, the long term equilibrium where profits as a residual dissapear and the complete product is distributed between rents and wages. In this scenario total wealth is determined by the Smithian competitive mechanism, but implies full employment of capital only. The second Ricardian scenario, which I have termed short-term[52], consists in considering the level and the composition of output, that is the level and the composition of aggregate demand, as given, then we can have positive profits as a residual.

In the Ricardian short-term perspective, total output and demand, fertility of land and technology are considered given, then the level of labor employed is

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[51] David Ricardo in a letter to Thomas Malthus October 9th 1820. Quoted by Kurz, Heinz D. and Neri, Salvadori. "Blaug on the Sraffian Interpretation" 2002. HOPE 34:1 (2002) pp. 226.
[52] Neo-Sraffians like Kurz and Salvadori, refer to this scenario: total output is assumed as given, as a long term position, they do not explain how the economy got there, in their view the analythical method of

directly dependent on the volume and the composition of demand, given the level of accumulated capital and technology. For a given level of employment, L, the wage bill is determined, $W = wL$, because the wage rate, w, is also considered known determined by social and historical conditions. Ricardo assumes diminishing returns in agriculture given the different productivity of available lands, so rents they are determined by the differential fertility of the land at the level where marginal land yields no rent, as a result of competition among entrepreneurs. The amount and the qualities of land are known hence total rents, R, are also determined.

In summary,

$Y = $ Given ;

$Y = f (L)$; given demand conditions and technology, the level of
employment is determined;

$W = wL$; where the wage rate is a socio historical given i.e. a subsistence
minimum.

$R = rT$; with, r, reflecting the structure of rents adjusted by differential
productivities at the level where marginal land pays no rent.

Total profits are determined as a residual:

$$P = Y - W - R$$

In the Ricardian short term perspective, capital is circulating capital only and it is equal to the wage fund, or total of wages advanced in the production process, hence:

$$K = W$$

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classical economics consists of comparing such long-term positions. In my view this is only the Ricardian

and the profit rate

$$\pi = P / W \; ; \; \text{or} \; \pi = P / K$$

The model is determined and as is well known this simple Ricardian model is valid only if and only if there is one single homogeneous good in the economy, or if wages represent the only input in a multi-good economy. In Ricardo's initial approach corn is the only input and output of the economy and obviously profits are an amount of surplus corn and capital is also a stock of corn. The economy as an hypersimplified giant farm producing and consuming corn with all the relevant magnitudes determined in physical terms. In this world the surplus of the economy, profits, as well as capital, are ultimately physical magnitudes. The different, more or less contemporaneous, attempts to generalize the Ricardian approach to a world with a multitude of inputs and outputs, with or without money, share this essential feature: capital and profits, or the surplus, are physical magnitudes.

As capital accumulates the economy is forced to use less and less productive lands, profits will decrease and rents will increase, at any given point in time we can assume that the total level of output or total demand is known, given the technology, the level of employment is determined and so are positive profits. However, in a Ricardian long term equilibrium profits will dissapear, the rate of profits will descend to zero and capital accumulation will stop, we have the Smithian competitive mechanism at work. The complete output will be distributed among wages, including managerial wages, and rents. This result forces the assumption of a given level and structure of demand and output, so that a certain level of employment can legitimately be considered with positive profits, and the distribution problem can be addressed. Ricardo himself did not worry very much about the problem of the determination of the total level of employment and

short term perspective.

hence output, so for him total output was a given, an independent variable. The logical structure of Ricardo's model requires the assumption of a given level of employment and output, or of aggregate demand, because without it, the only equilibrium level of output that the model admits implies zero profits and full employment of the physically determined capital stock, and if we incorporate a Malthusian wages/population mechanism we can have full employment of labour as well. Clearly this is a very uncomfortable position to be in for a theorist of the distribution between profits, wages and rents. From a contemporaneous perspective, it is interesting to note that what is missing is a theory of the determination of total output, that is of aggregate demand and hence of the level of employment. If we are to consider the possibility of employment levels distinct from the Ricardian equilibrium that corresponds to the full employment of productive capacity—that is of total accumulated physical capital, not necessarily of the labour force—and of the existence of positive residual profits. Keynes' theory of effective demand clearly rings a bell here: The level of employment depends on investment, investment on the profitability of capital, etc., etc. The curios thing is that Keynes considered Ricardo's domination of economics a disgrace for the discipline. He was of course referring to the generalization of the marginal rent theory to every factor of production and to the acceptance of Say's Law as an article of faith by the profession of his times. The point I want to stress here is that within the Ricardian perspective of profits as a residual, the total level of employment is either considered as a given or there is the logical need to introduce an alternative theory of income and employment. Alternative, that is, to the Smithian invisible hand theorem which constitutes a theory of the determination of the volume and the composition of real output and of relative prices, that is still alive and well today. But a theory that lacks a satisfactory explanation of the cost or price of capital as something different from the physical means of production.

In summary, within the Smithian perspective

$Y = \underline{Y} = SUM\ i = 1\ n\ \underline{Y}_i$

Where $\underline{Y}_i = \underline{r}T_i + \underline{w}L_i + \pi K_i$

And

$\underline{Y} = \underline{R} + \underline{W} + \underline{P}$ where $\underline{P} > 0$ because there is a $\underline{\pi} > 0$

That is the invisible hand system in a free market will take real output to its maximum level and profits will be positive, if and only if, we consider them as a real cost, as a price different from the price of the commodities that constitute capital, which is an inconsistency. You cannot conceive capital as a set of commodities which are priced as every other commodity and also say that capital in general has a unique price, $\underline{\pi}$, that depends ultimately on its scarcity. Strictly in terms of the classical theoretical system if we assume as valid the Smithian theory of the determination of the volume of output and relative prices and we conceive capital in physical terms, the only logical conclusion in free market conditions is that,

$\pi = 0$, and capital as something different from things will have zero value. Unless, of course, we revise the system and introduce new assumptions and theories.

Within the Ricardian perspective

$Y < \underline{Y}$ by assumption so $P > 0$

An assumption that requires a theory of the determination of Y that admits different equilibrium levels of total output and hence positive profits, a theory that is not present in the Ricardian perspective, then and now. Without such a theory the only logical solution is the long term Ricardian equilibrium where

$$\underline{Y} = \underline{R} + \underline{W} \qquad \text{because} \qquad \underline{P} = 0$$

It is easy to see here that the classical theoretical system could admit a Smithian-Ricardian interpretation of output determined by the Smithian competitive mechanism, and of profits as a residual as long as we introduce a temporal distinction between the short term where we can observe residual profits due to the differences between market and natural prices and the long term where residual profits will dissapear and prices will include only wages, including managerial wages, and rents. That is a long term equilibrium where prices are equal to production costs and include of course the cost of production of the means of production, but no such thing as the cost of capital in general. This is an ancient idea: costs are ultimately reduced to all kinds of human efforts and to the natural resources employed in production. Within the classical theoretical system as defined this solution represents the only consistent perspective to avoid the need of an alternative theory of aggregate income or of a special theory of the price of capital. All it needs is the introduction of time, that is, a dynamic approach that recognizes that the free market adjustment processes take time, so profits as a residual are the product of a temporary equilibrium where Say's law holds all the time. However, the temporal dimension was barely touched upon by the classics and it is still one of the least developed fields in the discipline. We will come back to this crucial issue.

Marx assumes a fixed relationship between wages and profits, the so-called surplus value rate or the 'rate of explotaition', an equivalent way to express this is that Marx assumes a fixed constant labour/output ratio (the Ricardian model assumes decreasing returns, that is a decreasing labour/ouput ratio). For Marx, labour is the only source of value so every hour of "socially necessary labour" is equal to one hour of value, the means of production, capital, only transfer their value to the commodities that are produced. Capital the means of production do not create value. At the most basic level Marx's labour value

theory is Ricardo's without decreasing returns to labour and capital, plus an ad hoc theory of surplus value, as we will see.

In summary,

L = Given ;

Y = f (L) ; given technology, natural resources, demand conditions and given the surplus value rate, p'. And Y/L a given too.

P/W = p' ; A constant because Y/Y is a constant too. It implies the assumption of constant returns of labour and hence of capital.

W = wL ; where the wage rate is a socio historical given i.e. a subsistence

minimum.

R = rT ; with, r, reflecting the structure of rents adjusted by differential productivities at the level where marginal land pays no rent. (Marx develops most of his analysis without land, however his theory of differential rent is not essentially different from Ricardo's)

In Marx profits depend on the 'rate of explotation' of the labour force, given the level of employment and the wage rate:

P = p' (wL) ; which is a redundant and circular expression because p' = P/W

and wL = W, so P = P

However, given that labour/output ratio is by definition given, total profits are also determined as a residual, just as in Ricardo, given the level of employment, the wage rate and total rents:

P = Y − W − R

In Marx, capital is comprised by the wage fund, variable capital in his terminology, plus fixed capital including physical inputs, constant capital in Marxian, hence:

$$K = W + C \quad \text{where C stands for 'constant capital'}$$

and the profit rate

$$\pi = P / (W + C) \; ; \quad \text{or} \quad \pi = (P / W) / (1 + C / W) \quad \text{where}$$

$P / W = p'$; the rate of exploitation and $C / W = c'$; the 'organic composition of capital', a measure of technical progress which Marx assumes will increase continuously as a result of capital accumulation. Then, the profit rate is:

$$\pi = p' / (c' + 1)$$

There is a direct relationship between the profit rate and the rate of surplus value, and an inverse relationship with the organic composition of capital. In the short term, with a given labour/output ratio and a given organic composition of capital, Marx restates Ricardo's theorem of the inverse relationship between profits and wages. What is different stems from the assumption of constant returns, that is a constant labour/output, which forces the introduction of an alternative mechanism—alternative to the Ricardian diminishing returns—by which profits can vary in the short term. The Marxian alternative is the class struggle through the industrial army of reserve mechanism: as employment expands workers demand and obtain higher wages causing profits to fall, which will reduce capital accumulation, output, and employment and wages will fall, etc., etc. The so-called General Law of Capitalist accumulation that is also a theory of the short term variations of the volume of output. Given the absence of Ricardian diminishing returns and to argue for a secular trend of the profit rate to

fall, Marx uses the argument of the secular increase of the organic composition of capital, c'. The latter plus a political power based explanation of the Ricardian profits/wages theorem constitute the main revisions of the classical theoretical system by Marx. Enough has been written about the inconsistencies of the Marxian Law of the falling rate of profit, so I will not dwell on that. So after all, we are left with the same choice of the Sraffians, either the profit rate or the wage rate has to be determined outside the system: the Sraffians opt for the profit rate as determined by the interest rate in financial markets; Marxists opt for the wage rate as determined by the class struggle. This of course, if we do not accept the Smithian competitive markets mechanism. But how can we establish that all commodities are traded strictly in terms of their values, without competitive free markets that push market or actual prices towards their equilibrium natural levels?

In the classical theoretical system the total product is exhausted by the remunerations of the resources used up in production, or by the receipts of workers, capitalists and landowners, that is the value of the total supply equals the value of the total demand. This well known classical postulate: Say's Law of Markets, supply generates its own demand, is the global or general equilibrium condition *par excellence* in classical economics, and it is the link to classical monetary theory as expressed in the quantity theory of money. Say's Law is already suggested in Smith's writings[53], even though it is clear that he was not aware of its implications as far as global adjustments of employment and prices. The important point to stress here is that the classical economists approach in terms of a theory of value that demanded that all commodities where traded in equilibrium in strict terms of equivalent values, implied the acceptance of Say's Law as *the* general equilibrium condition, not the only one, but an equilibrium condition valid in the short and the long term. Say's Law would admit any level of

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[53] 'what is anually saved is as regularly consumed as what is anually spent, and nearly in the same time too; but it is consumed by a different set of people' As Prof. Mark Blaug aptly expresses it: The operative proposition hidden away in Smith's phraseology is that saving is tantamount to investment because 'hoarding', the building up of monetary holdings, is regarded as an exceptional ocurrence. This is tied up

profits including zero profits, as in the Ricardian long term equilibrium where prices reflect only costs. Which brings us to a second long term general equilibrium condition characteristic of the classical theoretical system, that is: prices are equal to costs of production. This second equilibrium condition poses the problem of what exactly we mean by costs of production. In particular, what about profits? Considering that we have three alternative definitions of the 'prices equal to costs of production' condition. Which are: profits equal to zero in the Ricardian long term version, prices are equal to rents plus wages; positive profits at the level of the natural price of capital in the Smithian version, so prices include the 'normal' price of capital; and prices/costs of production that include an equal average or general rate of residual profits in Marx's short and long-term and in the Ricardian short term or temporary equilibrium. Nevertheless, this second long term equilibrium condition is fundamental for the theoretical system of the classics, Say's Law or the "market clearing" condition is definitely not enough. For Walras this was clear, however, many modern general equilibrium formulations, simply eliminate it, assuming away the problem of profits, capital, etc., etc.

Ricardo and Marx understood Say's Law clearly and that is why they criticized Malthus underconsumption and/or overproduction views.[54] Demand provided no limits to investment, there could be no systematic overproduction of commodities. In Ricardian terms 'Gluts' or 'secular stagnation' could not be explained by limits in demand, for Ricardo demand was insatiable and the only limit for capital accumulation was to be found in the fall of the rate of profit, which had nothing to do with the vagaries of aggregate demand, or with the interplay of the funds or money market. Ricardo's fundamental theorem was that 'profits

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with the view...that the medium-of-exchange function of money is the monetary function par excellence." Mark Blaug, "Economic Theory in Retrospect" pp. 57.

[54] There are opposite interpretations in this respect: the underconsumption hypothesis first advanced by Rose Luxembourg, Nicolai Bujarin and other heterodox Marxists, then followed by M. Kalecki, Baran and Sweeezy, among others that tried to interpret Marx's work with a Keynesian effective demand lense. On the Neo-Ricardian side there have been repeated attempts at trying to marry a micro-Ricardian/Sraffian profit determination approach with a Keynesian macro-effective demand analysis. That is, a Ricardian inspired theory of profits that implies and requires Say's Law, with a Keynesian macro view that rejects it. Several

depend on high or low wages' and in the long-term wages would increase because of the 'increased difficulty of obtaining food'. Marx arrived at the same conclusion: there is an inverse relationship between profits and wages, but using a completely different logic. The culprit was not to be found in the misery of mother earth, but in the contradictions of capitalism. Competition imposed the need for mechanization and mechanization implied lower profits relative to the increased value of fixed capital, while at the same time as capitalism developed the labouring masses would become stronger politically, fighting and obtaining higher wages, that would reduce profits. In the most advanced capitalist countries, these trends would cause more frequent and stronger crises until the proletariat increasingly aware of its historical destiny, would be able to take over by 'expropiating the expropiators.' So neither in Ricardo or in Marx, we find a rejection or an alternative to Say's Law.

In the classical theoretical system the value of commodities, that is relative prices, would be determined strictly at the production level, or to use modern terminology, in real terms not by monetary factors, and so would be the rate of profit as distinct from the interest rate. Ricardo rejected Smith's ambiguous and contradictory view that the ruling rate of profit could be estimated or determined by the market rate of interest which would depend on the demand and supply of capital conceived as investable monetary funds. On the contrary, for Ricardo the market rate of interest in equilibrium would be determined by the real rate of profit, that is without the influence of monetary forces which would have only temporary effects on the interest rate. Marx had a different view, the interest rate did not affect the rate of explotation and the economy's general rate of profit, the interest rate would only affect the distribution of profits, of the surplus value, among the capitalist class and this was a power based issue. What the classics shared was the view that monetary forces as expressed by the Lockean classic quantity theory of money would determine absolute prices only, that is prices in terms of a monetary unit, with no effect whatsoever in relative prices. For now it

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decades of attempts at providing Keynes with microfoundations based in Sraffa's work by the NeoRicardians

suffices to say that the classic quantity theory of money, of which the Fisherian equation $M = PT/V$ [55] is the best well known restatement, in its pure version implies Says' Law as an identity and vice versa. The value of money, as something different from a commodity with a value of its own, that is the real product that can be exchanged by a unit of money, would be determined by the quantity of money in circulation only. This means that V velocity of circulation of money and T, output in real terms, have to be considered as given, which turns the former equality into an identity: $MV \equiv PT$, allowing for the dichotomization of the pricing process, that is relative prices or values are determined independently of monetary forces and absolute prices depend on money only, a formulation that has the merit of showing clearly that money can not be assimilated to a commodity in particular, to wealth or to capital.[56] It is only a unit of account.

In the Fisherian equation, T, real output or total transactions in constant money prices, corresponds to, Y, as we have been using it, then:

$$MV = PY = y$$ where y represents nominal income, then

$$Y = y/P$$ that is real output deflated by the price level or the 'value of money' which depends on M

The consideration of the quantitative theory of money as a common element of the classical theoretical system does not constitute an essential addition to its logical deductive structure. As stated is just a way to measure

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and PostKeynesians, have shown that this is, indeed, a very difficult task.

[55] M total money supply, V, velocity of circulation, T total transactions in real terms or output in constant money prices, P price level. MV, total aggregate demand.

[56] Of course classical economists did not simply subscribe to a rigid version of Say's Law as an identity, many writers analyzed the effects of monetary forces on real variables and related adjustment processes, in particular the effects of periods of falling or rising prices, crises and depressions. For example, Ricardo's classical analysis of the relationship between the market rate of interest and its natural rate, which he saw as the profit rate on capital. Ricardo tought that an increase in the quantity of money could temporarily depress interest rates but as soon as the level of prices adjusted the interest rate would rise back to its natural level. In this analysis the basic idea of Wicksell's theory of the divergences between the natural and the market rate of interest, is already present. It is a distinct charachteristic of classical political economy that the rate of profit on capital and ergo the interest rate is determined by real forces. Monetary forces can affect the interest rate only when the money market is not in equilibrium. When it is, the interest rate is determined by the rate of profit on capital.

relatives prices in an arbitrary unit. Except for temporary disturbances money does not play any other role in the system different than a unit of exchange, and this was the generally accepted view of the classics.

To finalize this discussion of the classical theoretical system. I will review a series of articles[57] debating the interpretation of classical economics in terms of the generation and distribution of a social surplus to be distributed amongst the propertied classes for the purpose of consumption and accumulation. The so called Surplus Interpretation of classical economics. The debate has centered on a particular interpretation of classical economics as a distinct and essentially different approach from the dominant neoclassical thinking regarding basically the theories of value and distribution but with implications in every other field of the discipline: growth and capital accumulation, cycles, etc., etc. This particular interpretation can be traced back to Piero Sraffa's 1960 classic "Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory"[58] and is present in post-Sraffian or Neo-Sraffian literature thas has followed his approach. An recent article by Heinz D. Kurz was severely criticized by Mark Blaug, however, Kurz and Salvadori have maintained their terrain arguing that the correct way to interpret classical economics is centered around the concept of the surplus, defined as the quantities of the different commodities that were left over after the necessary means of production used up in production and the means of subsistence in the support of workers have been deducted from the gross outputs produced. The central theme of classical economics within the surplus interpretation is: How the surplus is distributed and which system of exchange values or relative prices of the different commodities can be expected to emerge as the result of the gravitation of 'market' or 'actual' prices to their 'natural', 'ordinary' levels or 'prices of production'. In a free market, that is in

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[57] See Kurz, Heinz D. "The Surplus Interpretation of Classical Economists" http://www.kfunigraz.ac.at/vwlwww/kurz/kurz.html Kurz, Heinz D. and Neri, Salvadori. "Understanding Classical Economics: Studies in Long Period Theory" 1998b. London: Routledge. Mark Blaug "Misunderstanding classical economics: The Sraffian interpretation of the Surplus Approach" 1999. History of Political Economy, HOPE 31.2:213-36. Kurz, Heinz D. and Neri, Salvadori. "Understanding Classical Economics: A Reply to Mark Blaug" 2000. http://www.kfunigraz.ac.at/vwlwww/kurz/kurz.html. Kurz, Heinz D. and Neri, Salvadori. "Blaug on the Sraffian Interpretation" 2002. HOPE 34:1 (2002).

free competition conditions, prices would oscilate around levels characterized by a uniform rate of profits on the value of the advanced capital. The centre piece of classical political economy in this interpretation would be the determination of the general rate of profits, the rents of land and the corresponding system of relative prices. From this foundation all other aspects of economic analysis: capital accumulation, technical progress, growth and development, etc., etc., will follow.

Kurz focuses on Ricardo and defines what he calls the logical structure of classical economists arguing that it is this particular structure what distinguishes "classical" from other economists, "neoclassical" for example. In his view Ricardo, and by a not very clear extension the rest of the classical economists, isolated the factors that determine distribution in a given place and time, and then analyzed the factors that can change them over time. Kurz and Salvadori argue that classical economics is essentially an approach that considers the following variables as independent variables or constants:

a)   The set of technical alternatives from which cost-minimizing producers can chose;

b)   The size and composition of the social product, reflecting the needs and wants of the different members of society and the requirements of reproduction and capital accumulation;

c)   The ruling real wage rate(s).

d)   The quantities of the different qualities of land available and the known stocks of depletable resources, such as mineral deposits.

These factors are sufficient to determine the rate of profits, rents and relative prices in a given place and time. According to Kurz and Salvadori this is the classical approach par excellence: "The classical approach to the theory of value and distribution in terms of the set of independent variables a-d exemplifies this. Clearly, none of the classical authors denied that outputs, techniques, the

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[58] Sraffa, P. 1960. Cambridge: Cambridge University Press.

distribution of the product, and relative prices were interdependent and that each of these magnitudes was bound to change over time. However, in determining the rate of profits, the rents of land, and relative prices *in a given economy at a given time,* Ricardo and the other classical economists started from data a-d, reflecting the achieved state of capital accumulation and technical knowledge, the scarcity of natural resources, and the relative strength of the parties, 'whose interests are by no means the same,' in the 'dispute' over the distribution of income."[59]

Kurz and Salvadori conclude: "Finally, we should like to stress that if data a-d specify the *logical structure* of the classical approach to the theory of value and distribution with its *assymetrical* determination of the distributive variables, an author or parts of his analysis, may be called "classical" if we encounter this logical structure in the theory of value and distribution put forward by him or her. The approach could survive because it does not depend on particular historical conceptualizations of some of its elements. More specifically: it does not stand or fall with the validity of the labor theory of value or of the Malthusian theory of population. This is the reason why the classical approach to the theory of value and distribution is not only of interest to the historian of economic thought, but also to the modern economic theorist."[60]

Mark Blaug criticizes Kurz and Salvadori on two main fronts:

First he distinguishes between rational and historical reconstructions of the history of economic thought.[61] One thing is to narrate as precisely as possible what a certain author or groups of authors wrote or said about something, the social and historical conditions and circumnstances that affected their life and works, etc. And another is to reconstruct their scientific contributions in a logical way in order to either evaluate alternative theories or explanations or to identify

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[59] Kurz and Salvadori, 2002, Pp. 229-230. The last quotes within the quote are from Adam Smith.
[60] Kurz and Salvadori, 2002, Pp. 234-235.
[61] See first section of this essay.

unresolved problems and to propose alternative solutions. Blaug argues against the Sraffian interpretation of classical economics as a rational reconstruction of the classical theory from the point of view of Sraffa's Production of Commodities by Means of Commodities. Clearly, in this particular conext, Blaug is not using the term 'rational reconstruction' in the sense of Imre Lakatos[62], as an internalist account of the evolution of science, or as we have developed it in this essay. Instead Blaug is suggesting that the Sraffians are: "Whig historians" who "view history as a relentless march of progress from past errors to present truths" a view where Sraffa's PCMC is considered the embodiment of truth and read retrospectively into classical economics, particularly into Ricardo and Marx. Kurz and Salvadori consider their work a rational reconstruction of classical economics in the Lakatosian sense, without developing their argument. I would say that their exercise is quite limited because as we saw in the first section a Lakatosian rational reconstruction involves the re-creation of the deductive structure of a particular scientific domain, not only the identification of the logical structure of a given perspective on a particular problem. Blaug argues that the classics can be betrayed by modern formulations because of their excessive concern with analytical rigor and mathematical formalization which implies "read(ing) Smith and Ricardo and Marx through Walrasian-tinted glasses."[63] Kurz and Salvadori read Blaug's criticism as an argument against rigor and formalization. However, considering that Prof. Blaug is one of the few contemporary economists that has taken very seriously the methodological issues of scientific research raised first by Karl Popper and followed and expanded by Lakatos applying them to the understanding and the practice of economics, I disagree with this reading. Blaug is clearly arguing for a complete and true representation of what the classics did say and against formalism:[64] that is the substitution of theoretical substance and empirical relevance for mathematical form. Of course, not against the rational

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[62] Lakatos, Imre. "History of Science and its Rational Reconstructions" in "The Methodology of Scientific Research Programmes – Philosophical Papers Volume I. 1978. Cambridge University Press.
[63] Mark Blaug "Misunderstanding classical economics: The Sraffian interpretation of the Surplus Approach" 1999. History of Political Economy, HOPE 31.2:229.
[64] See Blaug, Mark. "Disturbing Currents in Modern Economics" Challenge May-June 1998. For Blaug formalism is the problem. Nevertheless, this is a subject for another occasion, suffice for now to say that the

reconstruction of the history of science with analytical rigor and (possibly) with mathematical form, here I find agreement on both sides. The important point then would be if the Sraffian's 'rational reconstruction' reflects correctly the fundamental aspects of classical economics, which I think it does not.

In a letter from Ricardo to Malthus, Kurz and Salvadori find the following statement:

> "Political Economy you think is an enquiry into the nature and causes of wealth—I think it should rather be called an enquiry into the laws which determine the division of the produce of industry amongst the classes who concur in its formation. *No law can be laid down respecting quantity, but a tolerably one can be established respecting proportions.* Every day I am more satisfied that the former enquiry is vain and delusive, and the latter only the true objects of the science."[65]

Which brings us to my main objection to the surplus interpretation of classical economics. In short: the assumption of total output and its composition as a given is not a core element of classical economics, it is of course the central assumption of the Ricardian perspective, which requires such assumption in order to be able to determine positive profits as a residual in a competitive equilibrium. The determination of output for Ricardo appears 'vain and delusive' because the classical theory of output determination: the Smithian invisible hand theorem coupled with Say's law implied zero profits in the long-term equilibrium, or the consideration of profits as a cost as in the Smithian perspective rejected by Ricardo and Marx. The enquiry into the nature and causes of wealth in the spirit of Adam Smith is the original goal of the discipline. The fact that Ricardo considered output as given and refused to address seriously its determination,

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rational reconstruction of the development of science can be extremely useful and in this regard I find the contributions of Kurz and Salvadori very valuable and the extensive works of Prof. Blaug indispensable.
[65] David Ricardo in a letter to Thomas Malthus October 9th 1820. Quoted by Kurz, Heinz D. and Neri, Salvadori. "Blaug on the Sraffian Interpretation" 2002. HOPE 34:1 (2002) pp. 226.

does not permit us to generalize this assumption to the whole of classical economics. In particular when, as we have seen, Smith has a theory of (long term) output determination and in Marx we find the elements of one as well (output is determined at the level where existing capital can be profitably employed).

The classical theoretical system has at its core the Smithian theory of output determination, which is, as we saw, also a theory of price determination. In the concluding section of his paper, Blaug writes:

"So, is there a 'core' of classical economics? Obviously, yes if by 'core' we mean a central strand by which we recognize a work as belonging to 'classical economics', the strand that unites Adam Smith in 1776, John Stuart Mill in 1848 and Karl Marx in 1867. It is made up, all commentators agree, of a particular theory of value and distribution.

Firstly, classical value theory focusses on long period equilibrium prices characterised by a uniform rate of profit on capital, uniform rates of pay for every different type of labour, and uniform rents per acre for every qualitatively different type of land, in short, what Smith called 'natural prices' in contrast to 'market prices', subject to the vagaries of demand and supply." [66]

In fact, all comentators agree, and as we saw the main cleavage was in the conceptualization of profits, the determination of 'a uniform rate of profit on capital'. Most would also agree that the classical system was essentially concerned with the long term dynamics of the generation and distribution of wealth. To finalize lets consider the Neo-Sraffian view on this issue. Kurz and Salvadori state: "The classical authors studied the growth and development of an

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[66] Blaug, M. Pp. 23-24. Most of Blaug's critique is devoted to showing that a large part of classical economics is concerned with changes in the technology of production, the volume and composition of output, and the real wage rate, the main givens in the Ricardian/Sraffian approach. Blaug also notes that the Sraffians neglect the classical conception of competition: 'there is no competition of any kind in Sraffa, not even of the perfect competition variety.'

economic system essentially in terms of a sequence of long-period positions reflecting changes in output levels, technical knowledge, the scarcity of renewable and depletable resources, and the balance of power between the different classes of society. The long-period method was *the* analytical tool elaborated by them in order to study the complex dynamic processes under consideration."[67] Well, this is what Ricardo did and what the Sraffians do, and more than a dynamic approach—which cannot be seriously adopted whithout a theory of output determination and competition—is a method closer to what in neoclassical economics is referred to as comparative statics.[68] The problem with the surplus interpretation of classical economics is that it reduces the whole of the classical theoretical system to the short term Ricardian perspective, that demands, in the absence of an alternative to the Smithian theory of output determination, the simple assumption of considering the volume and composition of output as a given, in order to determine, correctly, profits as a residual. What is absent in this approach is the 'study [of] the complex dynamic processes under consideration'.

In summary, the theoretical system of classical political economy dealt with the generation, the distribution and the growth of wealth. Ultimately, wealth was conceived as dependent on the accumulation of physical capital, hence the conceptualization of profits played a key role in the system. As analytical principles the classics postulated that the exchange of commodities should be carried on in terms of strict values, every commodity should be traded for other commodities of equal value, relative prices should be determined strictly in accordance to this rule. The previous postulate implied of course the existence of

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[67] Kurz and Salvadori, 2002, Pp. 227.

[68] Of course, this is in itself an important problem to deal with: what Sraffa referred to as the general confusion between two distinct problems of explaining differences in values of two commodities at a point in time and changes in value of the same commodity over time. What Blaug calls: "The peculiar feature of Ricardo's approach, which sets it apart from the common run of value theories, is its concern with intertemporal rather than intratemporal comparisons of value." (p. 16). But this is not the central defining problem of the classical theoretical system, it is just a very particular variant and in my view not a particularly interesting one. In other words the Neo-Sraffian perspective compares long-period positions A and B with different given output levels; technical knowledge; scarcity of renewable and depletable resources; and, balance of power between the different classes of society. Without telling us nothing about how the system

free market conditions, pure competition in modern terms, and the acceptance of Say's Law of markets, as an economy wide equilibrium condition. To analyze the exchange of commodities under free market conditions the classics developed various labour theories of value, which all proved to be inconsistent.[69] Of course, a theory of value is required, however, the classical theoretical system as defined is not characterized by and it is not logically dependent on any particular theory of value whatsoever. In general, the classics adopted a view of prices where "market" or observable prices would move around or gravitate towards "natural" or equilibrium prices, that would reflect the "natural", "general" or "average," remunerations of land, labour and capital. With this the classics established what we can term as a second distinct global equilibrium condition, prices equal costs, the long run equilibrium condition par excellence. These views implied an

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got from A to B, and about the dynamic characteristics of this process, which was one of the central problems for Smith, Marx, Malthus among other classics or semi-classic economists.

[69] Nai-Pew Ong (1983) argues that Ricardo was interested in establishing the labor theory of value in a dynamic context. That is, he wanted to establish a one to one relationship between a change in the 'difficulty of production' of a commodity and its prices of production. Since an increase in the difficulty of production in the agricultural sector leads to changes in the distribution of income, which has an independent impact on the prices of production, Ricardo's intended 'invariable measure of value', or what Ong calls the divining rod, was somehow supposed to separate out all the complications caused by the latter factor. Ong's conclusion is that a solution to Ricardo's problem: that is establishing the labor theory of value in a dynamic context, is a theoretical impossibility. This is because in an interlocking input-output system an increase in the direct labor-time element in the production of a commodity may lead to either a rise or a fall in its price of production, depending on how the consequent fall in the rate of profits affects the cost of indirect, or dated, labor elements, the argument is similar to Sraffa's reswitching argument. In a WEB posting Ajit Sinha, commented: "Though Ong's argument is correct for Sraffa's analysis in the PCMC (PRODUCTION OF COMMODITIES BY MEANS OF COMMODITIES), he is simply wrong in the case of Ricardo. Ricardo never assumed that 'corn' or agricultural goods in general entered the manufacturing sector as raw materials or inputs, nor did he assume that the manufacturing sector provided inputs to the agricultural sector. In other words, he did not have a Sraffa-type interlocking input-output system. The two sectors were interconnected only because the wage basket contained both agricultural and manufacturing goods. In this case a rise in the difficulty of production in the agricultural sector would not affect the dated labor content of the manufacturing sector. Had Ricardo been working with an interlocking input-output system, then his assumption 'that in production of our money' the same quantity of labour should at all times be required would become meaningless. This is because a rise in the difficulty of production in the agricultural sector would affect the indirect labor content of the measuring rod as well. Thus maintaining the 'same quantity of labour at all times' would amount to constant and artificial adjustments in the production technology of the money commodity to keep its total labor content constant. Clearly Ricardo was bright enough to see this much, and there is no evidence in his writings to show that he meant anything other than constant technology by the condition of 'same quantity of labour at all times." (No date available). Of course, Ricardo's assumption is very restrictive and artificial, in the more realistic PCMC Sraffian world Ong's theoretical impossibility conclusion holds, ergo the labour value theory is subject to re-switching and does not hold, except as a special case with very restrictive conditions! See, Ong, Nai-Pew. (1983), "Ricardo's invariable measure of value and Sraffa's 'standard commodity'", History of Political Economy 15(2): 207-227. See also, Sinha, Ajit. (1999), "Surplus Approach to Political Economy", Encyclopedia of Political Economy vol.2, ed. P.A. O'Hara. London: Routledge. Sraffa, Piero. (1960), "Production of Commodities by Means of Commodities. Prelude to a Critique of Economic Theory." Cambridge: The University Press.

approach that considered the economic system as a whole, in contemporary terms: a general equilibrium approach. For the classics, real world economies were always in the short term, that is prices were always different than costs, market prices differed from natural prices, and the long term equilibrium adjustment process, was characterized either by a trend towards stagnation, as in Smith and Ricardo, or by continuous fluctuations and instabilities, as in Marx. The key for the understanding of the dynamics of real world economies was in the generation of profits, the profitability of capital and in its long term trend. The analysis of monetary phenomena by the classics can be summed up by the classical quantity theory of money, which relegated the influence of monetary factors to the realm of short term temporary effects at most, without providing any essential link between the forces at the production level, real determinants, and monetary forces like the interest rate, the money supply, capital markets, etc., etc. The world of finance does not occupy an analytical space with the classics, there are, nevertheless, innumerable historical, anecdotical, practical and policy references. All the classics shared a conception of capital in physical terms, however, it is in the conceptualization of profits where the main cleavage of classical economics is to be found, profits are either a cost, as in the Smithian perspective, or profits are a residual, as in the Ricardian perspective. Given the privileged position of profits at the core of the theories of capital accumulation, value and distribution, as well as in modern financial economics, the analytical and practical consequences of the aforementioned divide reach to the whole of economics.

Paraphrasing Prof. Blaug's question: Is there a 'core' of the classical theoretical system as defined? A core, in the sense of a set of problems that can be considered fundamental or essential within the classical theoretical system and that are relevant for contemporary economics, so that theoretical research in this respect can be considered 'classical'. My answer would be yes, and it is the study of the complex dynamic processes whereby, real world economies that are always in the short term, that is in a situation where market prices are different

from natural prices and profits are different from zero, converge or not, either in a stable or in an unstable manner, towards a long term equilibrium where prices equal costs. A 'classical' study of these processes would concentrate the analysis in the generation of profits, the profitability of capital and in its long term trend.

4. Neoclassical developments on Profits and Capital.

The adoption of a Smithian perspective on political economy is the trademark of neoclassical economics: the focus on the determination of total wealth and the role of competitive markets. The continuity of the classical system in this respect is remarkable: at the hard core we have one main, relatively consistent, approach that results from the Smithian competitive pricing mechanism, the so-called "invisible hand," coupled with Say's Law of markets. The workings of such a mechanism, through prices and quantities adjustments, in individual markets of commodities first, and then as a derivation in the markets for labour, land and capital, will result in the maximum output possible, at the minumum cost, given that wages, rents and profits, as the cost of capital, will be remunerated in the end at their natural rates. For Smith this was a long run hypothetical result from his "system of natural liberty": it would be necessary to get rid of every form of mecantilism and to establish the appropriate social and political institutions, before truly free markets could be expected to produce such results. Nevertheless as it is known now, in the meantime we have no way of knowing if we are close or far from this ideal result.[70] In the short term market prices differ from natural prices; land, labor and capital are remunerated at rates different from their natural rates, Say's Law, of course, holds at every point in time. But only when prices reach their natural level, that is when they are equal to the amounts of land, labour and capital, required for their production as technically determined, times the natural rates of wages, rents and profits, the economy reaches its full long term equilibrium. Other than at this ideal point the actual or market level of wealth is not determined. Needless to say, the classical Smithian proto-theory of wealth determination required a consistent theory of value to support the workings of the free market mechanism as postulated. The different versions of labour value theories were inconsistent and the problem of profits remained: if they are considered as a residual, á la Ricardo, then, in the

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[70] In modern terms this is the Lipsey-Lancaster Theorem: When an economy is not in a first-best optimum there is no way of telling wether a given change takes us nearer or further away from the first-best optimum.

long run equilibrium profits are zero, all prices of all commodities are reduced by competition to the costs of labour, including managerial wages, and to rents for the natural resources involved in production; if profits are considered as the cost of capital, á la Smith, then the theoretical problem is to elucidate this particular cost as something distinct from the commodities that are used in production.

Within the theoretical system of classical economics, the central problem to be solved was the question of value, that is of the relative prices of commodities, including those used for production. Walras understood this clearly and made this problem the starting point of his work. As Walras expressed it: "*Pure Economics,* is in essence, the theory of the determination of prices under a hypothetical régime of perfect competition." For Walras a consistent solution to the question of value was the necessary initial step in order to develop a *Theory of Social Wealth,* as the second part of the title of the *Elements* states.[71] To determine relative prices, Walras, as well as Jevons and Menger concentrated in the static analyses of resources' allocation. They posited given resources, the quantities and the quality of which were determined outside the economic system. The problem of economics then, was to establish the conditions under which given resources, land, labor, capital, raw materials, or in general, productive services, were allocated among competing uses, generating maximum consumers' satisfaction, the vector of prices that produced this result was the equilibrium solution. If the goal was to maximize consumer's satisfaction, or "...the utility of the produce...", it is easy to grasp the reasons why marginal analysis became the central tool of neoclassical economics. Hence, the name of marginalism given to it by its critics or the marginal revolution as it is known by its admirers. The central element of the neoclassical theory of value, as it came to be known, was the principle that economic behavior is maximizing behavior under constrained conditions. The extensive use of the concept of substitution at the margin explains the introduction of explicit mathemathical reasoning and in

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[71] Walras, Leon. *Elements of Pure Economics or the Theory of Social Wealth.* First published in installments between 1874 and 1877. All the references are from the English translation by W. Jaffé, London: George Allen & Unwin. 1954.

particular of calculus, to analyze the processes of equalization of marginal values. In dividing a fixed quantity of anything among different competing uses: efficient allocation means that the number of units assigned to a particular use, is such that the transfer of one unit from one use to another, equalizes the gain in the new use with the loss in the old. The principle holds for the allocation of any type of resources we are talking about, income among consumer's goods, time of leisure and work, productive services as labor, capital, and land within a firm, etc., etc. Nevertheless, the allocation problem has a maximum solution, if and only if, the transferring process is subject to diminishing returns: the more a consumer enjoys a particular good the less utility it derives from it; the more labor we apply to a certain given task the less productive it becomes. Again, this is valid for households allocating income to different uses, thanks to the law of diminishing marginal utility that ensures that an optimum exists. And for firms searching for optimal factor purchases, the allocation problem has a solution thanks to the law of diminishing marginal productivity. This was an extension of the Ricardian[72] theory of rents, to capital and labour. In modern terms, these two 'laws' are particular cases of the equimarginal principle that applies only to definite quantities of money, time or any other resources to be allocated or distributed among competing uses, by a maximizing agent.

Neoclassical economists treated distribution theory and factor pricing as part of a general value theory. Considering the existing land, capital and labor as given, also as known the initial distribution of factors, endowments, among households with given preferences which try to maximize the satisfaction from their expenses, and profit maximizing producers, which with given technologies acquire factors from firms to produce the goods and services demanded by households. They showed how the prices and quantities supplied of final goods and factors are determined in competive markets. So the distribution of income between labor, capital and rents became a theory of factor pricing, the market

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[72] According to Luigi Pasinetti the synthesis of the theory of differential rents, first developed in 1777 by James Anderson and the principle of diminishing returns, into what we know as the Ricardian theory of rents, is due to Malthus.

determined interest/profit rate, wage rate and rents, times the volumes of the factors employed will exhaust the total income or net product. If markets are perfectly competitive, plus other ifs, total product and consumer's satisfaction will be maximized and will be equal to the sum of functional incomes, which are in turn determined by the contribution of each factor to the production process, and are, ergo, efficient and fair. The neoclassical theory of value aimed to provide the Smithian classical theory of wealth determination with the logical foundation it did not have and presented a theoretical alternative to the Ricardian theory of distribution from within the system[73]. Nevertheless, the theory of profits it offered, within the Smithian perspective of profits as a cost, relied on a notion of capital as a physical entity with a productivity of its own and depended on the assumption of the strict applicability of the equimarginal principle to the substitution of capital for labour in production, at least in the early phases of general equilibrium analysis and until these days within the neoclassical production function[74] tradition.

These last two neoclassical developments:[75] the original Walrasian general equilibrium approach, and later the production function approach initiated by Knut Wicksell with the refinement of Böhm-Bawerk's capital theory[76] and

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[73] Even though the neoclassical theory of value was an independent theoretical development that took place before the radical socialist critiques that emerged at the end of the 19th century, it definitively provided, and still does, significant rethorical ammunition against them.

[74] The theory of the firm states that it is always possible to specify a function which expresses the maximum volume of physical output obtainable from all technicallly feasible combinations of physical inputs, given the knowledge about input-output relationships and considering that technical knowledge is freely available. Inputs are usually classified into more or less homogenous classes and both outputs and inputs are measured in flows. It is assumed for convenience that the production function so defined is smoothly differentiable. In this view is is strictly necessary to assume that firms are profit maximizing. The input demand functions or the factors demand, are derived as an inverse form of the marginal product equations. In perfectly competitive factor and product markets firms will hire workers, machines, and space until wage rates, machine rentals, and land rentals are equal to their respective marginal value or marginal revenue products.

[75] For a recent survey and critique of these approaches from a NeoRicardian perspective see: Pasinetti, Luigi. "Critique of the neoclassical theory of growth and distribution" Entry prepared for the Storia del XX secolo, planned and so far unpublished, by the Instituto della Enciclopedia Italiana. Available for PDF download at Prof. Pasinetti's website.

[76] In Bohm-Bawerk capital is associated with roundabout methods of production: In order to reap a harvest, you could send workers into the fields to pluck the ears of corn. A more efficient method is to spend capital on making scythes and then use this to cut the corn. An even more efficient method is to spend even more capital manufacturing reaping machinery and use this to harvest your corn. Progress is achieved through the use of labour in more roundabout methods of production; a widening of the gap between inputs and outputs. Capital supplies the necessary subsistence to labour during the 'waiting time' before new consumer goods

followed by many others are closely related, but they cannot be assimilated to each other, it might be argued that in their modern versions they are essentially different. I will discuss first the production function approach that relies directly on the equimarginal principle. The equimarginal principle in production means that the agent in control of the production process, will employ additional units of a productive factor, land, labour or capital, until the value of the additional output, obtained by the use of such factor, is equal to the cost of the factor, which equals the remuneration of the factor's owner. For example, more hours of labour will be employed if the hourly wage is less than the value of the additional output that is produced with that labour. In a pure competition equilibrium, the wage, rent or profit rate will be equal to the marginal product of labour, land, and capital, respectively. Using calculus, the marginal product of productive factors is expressed as the partial derivative of output with respect to the factor. With the same notation as before, we have output as a function of the total available resources, land, labour and capital:

$Y = f(T, L, K)$; production function

$Y = R + W + P$; Say's law

r = Rent (Rate per unit of Land)

w = Wage (Rate per unit of Labor)

π = Rate of Profits

And,

$Y = rT + wL + \pi K$

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are produced. This waiting time is extended to yield increased productivity until, in equilibrium, productivity is equated with the rate of interest. The nature of the rate of interest could be found in: a) people expect to be better off in the future; b) people put a lower valuation on future goods than on present goods; a) and b) result in a time preference, people are willing to borrow now against future income, to increase consumption today; c) a technical proposition is added, existing goods are technically superior to future goods, because in the interval existing goods are capable of producing more goods. "Capital and Interest" (1884) and "Positive Theory of Capital" (1889). Once you dissect Bohm-Bawerk's theory of interest is a restatement of the ancient capital as the wage fund theory, only with a variable period of production.

Where in equilibrium:

$r = dY/dT$

$w = dY/dL$

$\pi = dY/dK$

So, $Y = (dY/dT)T + (dY/dL)L + (dY/dK) K$

It is argued that in perfect competiton given the initial endowments, that is the distribution of resources among households, the economic system as represented will generate inverse monotonic relationships between the physical quantities of the diverse factors and the corresponding rates of remuneration, and hence the system will converge to the full employment of all factors resulting in an efficient and stable equilibrium, the value of total output will be exactly the same as the aggregate value of all remunerations. Nevertheless this result is obtained, if and only if, the production function is of a particular form that satisfies Euler's Theorem, only then the equation:

$Y = (dY/dT)T + (dY/dL)L + (dY/dK)K$;

will hold together with Say's law:

$Y = R + W + P$;

Only in this particular case, that corresponds to a very particular conception of the cost of capital as the marginal productivity of capital, the two classical equilibrium conditions: Say's Law, valid in the short and in the long term; and prices equal costs, valid in the long term only, come together. With the implication that Smith's and Ricardo's long term, becomes a short term result only: prices are always equal to costs, total wealth is always maximized, the economy is always employing fully all available resources. No wonder the

classic's and also Walras' long term condition that prices equal costs has been practically abandonned in the modern literature as such, it has become an implicit assumption. It seems now that only the market clearing condition is enough.

So that the typical well behaved neoclassical results entail, the production function has to be a linear, homogeneous of the first degree, continuous, smoothly differentiable function, and there is nothing in the real world that permits us to conclude that such is the general case[77]. It can only be assumed that production functions at the firm level and at the aggregate have this particular characteristics. If we assume that the production function is convex, then it implies constant returns to scale and diminishing returns to scale to the variations of proportions between the factors of production. As labour is substituted for capital the marginal product or the return of capital will decrease. There is a monotonic, well behaved, inverse relation between capital intensity and the return on capital. Of course, all these results depend on the assumption that the production function is of a certain form. Most recent formulations have left land out of the equation and concentrated on aggregate production functions with labour and capital only, maybe the best known of these functions is the two factor Cobb-Douglas, production function:

$$Y = AL^{\alpha} K^{\beta}$$

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[77] In short linearly homogeneous production functions imply that: (1) the marginal product of a factor varies only with changes in the relative amounts of the factor employed; (2) the participating factors are complementary, an increase in a variable factor depresses its own marginal productivity but increases the marginal productivity of the fixed factor; and (3) the total product is exactly exhausted by payments to the participating factors in accordance with their marginal productivity. If the production functions are not of the first degree, the total product will either exceed or fall short of the sum of the distributive shares. In the case of diminishing returns to scale, the sum of market-imputed factors payments will fall short of the value of output, leaving a residual to be earned by the 'fixed' factor. In the case of increasing returns, the total product is insufficient to reward all the contributing factors according to their marginal productivity, and some factors are not getting what they are supposed to according to the theory; increasing returns to scale destroys competition and hence the basis of marginal productivity factor payments. The basic point is that only in a very particular case Say's Law in the classical sense $Y = R + W + P$; and the neoclassical postulate $Y = (dY/dT)T + (dY/dL)L + (dY/dK)K$; coincide and there is no evidence that supports that this is the general case.

Where A, β, α, are parameters to be estimated, and $\alpha + \beta$ is expected to be 1; so, $\beta = 1- \alpha$; to satisfy Euler's theorem. Under circumstances were factor prices are determined by pure competition conditions wages and profits would be equal to the marginal products of labour and capital, full employment and all the good things would entail. Additionaly, α, would represent the share of wages in national income, and, β, the share of profits. These parameters would be considered as technical constants and as such, it is implied that policy attempts to change them would affect the efficiency and stability of the system. Cobb-Douglas functions have been thouroughly subjected to empirical testing since the 1930s, despite early "succeses" over time the results have been frankly dissapointing[78] from the perspective of the Smithian perspective of profits as a cost. Without delving into details, my interpretation of Sylos-Labini survey (1995) results, is that in those cases where the results are NOT assumed to conform with the underlying marginal productivity theory, that is when the parameters α, and β, are not assumed to sum 1, they support the Ricardian perspective of profits as a residual[79]. It is well known that among the implications of the production function type of analyses are the notions that the economic system as represented is efficient from the technical point of view, and fair from the distributive perspective. It is not clear, however, how these conclusions derived from a simple equation with dubious empirical results can be translated to the real world we live in. As was J. B. Clark's contention of the late 1800s[80], that

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[78] "In a recent article, Sylos Labini (1995) has presented a survey of the empirical applications that have been carried out with use of the Cobb-Douglas production function since the 1930s up to the present day. He has been compelled to draw decidedly negative conclusions. Suffice it to mention that, in the overwhelming majority of cases, the sum of the two parameters (α and ß), which should represent the distributive shares, come out to be decidedly far from unity; in some cases the parameters even turn out to be negative! An obvious contradiction. And yet, to rid themselves of this contradiction, what the researchers have done has simply been to introduce a further assumption which would eliminate the contradiction. They simply introduced the constraint that the sum (α + ß) be equal to unity; and then proceeded to empirical estimates after having imposed such a constraint, thereby entirely foregoing any "explanation" of the distributive shares." Pasinetti, Luigi. "Critique of the Neoclassical..." p. 27. It is clear that this is the only way to make the short term and the long term conditions coincide, you assume they do.

[79] The founder of modern growth theory, Solow, used to say that the ever present residual was the measure of our ignorance, or maybe it is just the measure of residual profits.

[80] The American J. B. Clark founder of the marginal productivity theory of distribution, argued that market forces awarded productive factors a set of rewards that were not only efficient but also fair. He considered that his theory provided a normative principle for distributive justice. His theory contends that in equilibrium each factor of production, or productive agent, will be rewarded in accordance with its marginal productivity, as measured by the effect of adding or withdrawing a unit of that agent on the total product, while maintaining the other factor's quantities fixed. Bohm-Bawerk made the following criticism: if the product of

there was something like the "social marginal product of capital" reflected in the observable distribution of income. Samuelson extended the simple two sector model to a multisector economy contending that the basic idea of the simple labour and capital model was representative of modern complex economies[81].

Joan Robinson in her famous essay "The Production Function and the Theory of Capital" (1953-1954) re-opened the attack on the neoclassical conceptualization[82], attack that started the famous "capital theory controversies."[83] She concentrated the critique on the neoclassical concept of

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the marginal unit of labor governs the wage rate and labor works subject to diminishing returns, the intramarginal worker will receive less than the amount he contributes to the total product. That is, according to marginal productivity theory, workers are subject to exploitation because they do not receive this intramarginal surplus. Clark replied to this objection by saying that the theory assumes that each factor is perfectly homogeneous and all units of the factor equally efficient; marginal productivity of labor falls as more labor is added to a given amount of capital because capital per unit of labor is falling. Obviously if the same workers work with more capital their marginal productivity will increase. Clark was not aware of the devastating consequences of his answer to Bohm-Bawerk for his theory. So the marginal productivity of each factor depends on the productivity of the other! As Mark Blaug pointed out: "There is no such thing as a specific marginal product of a factor considered in isolation: the factors of production are basically complements and the marginal product of one factor is a consequence of the marginal product of the other factors." Blaug, Mark. "Economic Theory in Retrospect" Third Ed. 1978 P. 451

[81] It is important to note that the idea that the functional distribution of income for the economy as a whole could be explained simply by invoking the principles of marginal productivity consecrated in an aggregate production function, was developed for the first time until 1932, in Hick's Theory of Wages. Great neoclassical writers like Wicksteed, Wicksell, Walras and Marshall analyzed the problem of factor pricing without appealing to the concept of an aggregate production function, making homogeneous output a function of homogeneous capital and homogeneous labor, much less an aggregate production function of the Cobb-Douglas variety with its unitary elasticity of substitution. It can be said that until Hicks there was no theory of the shares of wages and profits in total income that was more or less acepted within the field of neoclassical economics. The hold of J. B. Clark through the writings of Hicks and the subsequent generalization of the use of aggregate production functions, in the classroom and empirical work, to disgress lightly on income distribution might only be explained in ideological terms, or most likely because of the inexistence of alternative explanations. Citing Mark Blaug: "...it comes as something of a shock to realize that only J. B. Clark and possible Bohm-Bawerk among the great 19th-century neoclassical economists ever operated with a simplistic marginal productivity theory of distribution applied to the economy as a whole, conceived as it were, one giant firm. Thus, the view that the rate of wages and the rate of interest in neoclassical theory are determined by the marginal productivities of labor and capital is a vulgar simplification of the ideas of most 19th-century economists in the neoclassical tradition." Blaug, Mark. 1978. P. 487.

[82] She posed the central questions that dominated the debate: What do we mean by capital in neoclassical economics? How do we measure it in technical units (or in a way that it is independent of distribution and prices, so it can be used coherently in a production function and legitimately regarded as one of the determinants of distribution? What sense can be made of the notion of an economy getting into equilibrium? Either it is in equilibrium (plans and expectations are fulfilled) and always have been there or not. There is no guarantee or sense in the notion of convergence on, or fluctuations around an equilibrium position. What sort of society is being analyzed? What is the meaning of capital?

[83] The literature on this theme is voluminous and has been amply surveyed and reported, just to mention a recent recapitulation by one of the great survivors on the Cambridge, UK, side, see: Harcourt, G. C. (1994) "The Capital Theory Controversies" in "Capitalism, Socialism and Post-Keynesianism" Selected Essays of G. C. Harcourt. 1995. Aldershot, Edward Elgar. Harcourt concludes with a very sad note: "...the current position is an uneasy state of rest, under which a time bomb is ticking away, planted by a small, powerless group of economists who are either ageing or dead." P. 45.

capital. In short she argued that capital as employed in production functions could not be used to determine the interest rate or the profit rate and hence the distribution of output, because the aggregate value of capital depended on prices and hence on the distribution of income. Capital was a set of heterogeneous capital goods and could not be reduced to a single homogeneous entity with a dimension independent of prices. The publication of Piero Sraffa "Production of Commodities by Means of Commodities" in 1960, constitutes another landmark in the capital theories' debate, thanks to the discovery of the phenomenon of "re-switching of techniques"[84] or "reverse capital deepening." Sraffa argued that as variations take place in income distribution between profits and wages, the production techniques that are chosen as the most profitable ones, do not follow each other in an unambiguous and unchanging order. The production techniques that require a high proportion of capital to labour at a low rate of profits may well be discarded by other (more profitable) techniques when the rate of profits is higher. The former production techniques may become the most profitable techniques once again at even higher rates of profit. These results are valid, whatever convention may be adopted to "measure" capital. The famous Samuelson (1962) article about the surrogate production function, attempted to show that the one commodity model which exhibited all the agreeable propositions concerning the workings of competitive capitalism and which reflected the central insight that price is an index of scarcity, carried over to the rigourous general equilibrium heterogeneous goods models. Nevertheless, Sraffa's central critiques were not superated.

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[84] The phenomenon of "re-switching of techniques", went virtually unnoticed when Sraffa's book (1960) was published, until the mid 1960s through a series of essays forming a "Symposium" edited by Samuelson in 1966. The opening article of such Symposium, was written by Pasinetti (1966) as a criticism of a previous article by Levhari (1965). The Symposium was followed by a copious literature (For surveys see Harcourt, 1969, 1972). As Luigi Pasinetti recently wrote: "The main theoretical finding of these contributions is that in general there is no inverse monotonic relation between quantity of capital (whatever the method chosen for its measurement, whether in physical or in value terms) and rate of profits, a phenomenon also known as reverse capital-deepening." In "Critique of the neoclassical theory of growth and distribution" Unpublished. Pp. 33-34.

From the capital controversies the following two generally accepted[85] central propositions emerged: The conditions to be satisfied in order to aggregate heterogeneous capital goods are so extraordinarily restrictive as to rule out any reasonable possibility of constructing an aggregate physical measure of capital goods. And, there is no inverse monotonic relation between quantity of capital and rate of profits. This is applicable both to the economic system as a whole and to the individual productive processes, and it is a proposition independent of the method chosen for measurement of capital, whether in physical or in value terms.

Ergo, in any aggregate of capital in terms of value the prices of capital goods, incorporate profits and /or the interest rate, so it cannot be used to determine them. But notwithstanding the problems of aggregation, that in my view can be equally challenging in the case of labor and natural resources, the main definitive result is that the equimarginal principle applicable to production in the form of the substitution of labour for capital could not be sustained as a generally valid proposition. The attempt of the neoclassical economists to provide the classical theoretical framework with a consistent theory of value, that incorporated the Smithian notion of profits as the natural cost of capital determined in real terms, that is within the 'sphere of production' to use an

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[85] As the editor of the 1966 Symposium Paul Samuelson concluded:"[...] the phenomenon of switching [...] of techniques [...] shows that the simple tale told by Jevons, Böhm-Bawerk, Wicksell and other neoclassical writers alleging that as the rate of interest falls in consequence of abstention from present consumption, in favor of future, technology must become in some sense more roundabout, more 'mechanized', and 'more productive' cannot be universally valid [...]. There often turns out to be no unambiguous way of characterizing different processes as more 'capital intensive' [...].[...] If all this causes headaches for those nostalgic for the old time parables of neoclassical writing, we must remind ourselves that scholars are not born to live an easy existence. We must respect, and appraise, the fact of life." (Samuelson, 1966b, pp. 568, 582-3). Charles Ferguson (1969), in a book dealing specifically with the neoclassical theory of production and income distribution, reiterated Samuelson's propositions: "... the Cambridge Criticism definitely shows that there may be structures of production in which the Clark parable may not hold [...]. The crux of the matter is that economists may be unable to make any statements concerning the relation of production to competitive input and output markets. I believe they can; but that is a statement of faith, [...]". (Ferguson, 1969, p. 269). See Pasinetti, Unpub. P. 34-35. Prof. Blaug in his Economic Theory in Retrospect (1978) wrote: "The fact remains, however, that the Switching Theorem suffices to show that the Austrian theory of capital—meaning the theory which reduces the differences between capital goods to 'time' and which then measures 'capital' as an 'average period of production', the rate of interest being determined by the interaction of the average period and the three reasons for positive time-preference on the part of individuals—is untenable." P. 557.

ancient expression, failed in its production function version[86]. The equally ancient theory of capital as a wage fund survived, but only in its monetary version, the cost of money, 'funds', is the interest rate. But if money is only a unit of exchange that cannot be assimilated to wealth and definitively not to capital, as it is clear within the classical theoretical system and in the classic formulation of the quantitative theory of money, then the Ricardian strictures against this facile, also Smithian, attempt out, apply. In the Ricardian short term, profits as a residual would be determined in real terms and the interest rate would gravitate towards the profit rate not the other way around. The long term implication of Ricardo's position would be a zero interest rate and zero profits. Which coincides with Frank Hahn's discovery that the nill value of money is an equilibrium solution.[87] If we are not able to consistently demonstrate that there is something like a cost of capital, measured as the profit or interest rate, that is different and independent from the prices of the physical commodities used as capital, then the Smithian and the Ricardian long term equilibria are one and the same. The neoclassical aggregate function approach treats the economy as if it was always in and around this point, departures from this point can only be explained by exogeneous forces or random shocks.

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[86] The general equilibrium approach in its modern Arrow-Debreu, A&D, derived formulations, that do not rely on the traditional production function approach using activity analysis instead, are inmune to the re-switching critique and have succeded in providing a consistent theory of value for all commodities. They are capable of determining relative prices for all present and future commodities. However, their treatment of capital and of the profitability of capital is still very far from satisfactory. The revolutionary character of activity analysis lies, from the instrumental perspective in the set-theoretic approach which is more fundamental and powerful than the smooth differentiable production function traditional approach. From the more ample theoretical perspective it provides the foundations to analyze production in a strictly technical resource allocating way. Without making confusing and arbitrary distinction between the commodities used in productions and without endowing arbitrarily defined aggregates like land, labor or capital, with physical productivities of its own that are independent of its use. Some early versions of activity analysis often made a distinction among primary, intermediate, and desired commodities. Primary commodities defined as the ones which flow into production from outside the production system; intermediate commodities which are the ones produced only for use as inputs for further production; and desired goods as those produced for consumption or other uses outside the production system. These are clearly arbitrary definitions that cannot illuminate the fundamental issues pertaining capital and distributional theories.

[87] In 1965, in a pioneering essay Prof. F. H. Hahn of Cambridge UK, put forth the suggestion that money may be worthless: Money is characterized by the quality that is desired for what it will buy. If, for some reason, it were worthless, it could not be valuable in this way. Hence there would be no excess demand for it. But this means that the nil value in exchange is an equilibrium "price" of money. There is an equilibrium where the economy is effectively demonetized; it no longer appears to be a monetary economy. Hanh, F. H. "On some problems of proving the existence of an equilibrium in a monetary economy" In *The Theory of Interest Rates* F. Hahn and F. Brechling, eds. 1966, Macmillan, London and Basingstoke. In my view the classical long term is such an equilibrium where the economy is demonetized: the excess demand for money is nill.

The general equilibrium approach initially developed by Walras is a generalization of the Smithian idea that prices of commodities and production factors, are determined by the particular demand and supply conditions prevailing in each market. The Walrasian system is very well known a brief summary will suffice. What Walras demonstrates is that under certain conditions general equilibrium is possible, that is equilibrium prices for factors and products, defined as prices that satisfy two conditions, markets clear and unit costs and prices are equal, can be determined simultaneously. Walras considers as given the technological conditions of production; the 'scarcity' or marginal utility functions for productive services and productive goods; the initial quantities of productive services in possesion of individuals; among other relevant data as we saw. He derives individual budget equations, demand and supply equations for every productive factor and commodity, and by adding the individual supply and demand functions of firms and households obtains the market supply equations for productive services, the market demand equations for finished goods. Walras establishes his classic equilibrium conditions that the quantity of factor services must equal the quantity offered and the prices of finished goods must equal their average costs of production. All in all, Walras defines $2m + 2n$ equations, one of which is not an independent equation because it is satisfied given that the budgent equation of every individual holds, that is Walras' Law, or Say's law holds. So the Walrasian system has $2m + 2n - 1$ independent equations that correspond exactly with the same number of variables or unknowns that need to be determined: n quantities of productive services to be supplied; m quantities of finished goods demanded; n prices of productive services; and $m - 1$ prices of finished goods since one of this prices is by definition 1, the *numéraire*. In Walras initial formulation the level of absolute prices, that is money prices, is undetermined. All prices are relative prices measured in terms of an arbitrary physical unit, the finished good selected as the *numéraire,* so the price level is not determined. The Walrasian 'solution' to this problem was to introduce the

demand for money as circulating money in all utility functions, as it is known in modern general equilibrium analysis this is not a satisfactory solution. Walras originally assumed fixed technical coefficients of production but in later versions he adopted the general marginal productivity theory of distribution, postulating the proportionality of the marginal productivity of different factor services to their prices, this step was carried on in way that added the same number of equations and unknowns to the system so general equilibrium was maintained. Nevertheless, by adopting the marginal productivity theory of factor pricing, Walras implicitly rejected his long term condition that prices equal costs of production, because according to the marginal productivity theory postulates, factors are always remunerated at their cost, so prices always equal costs. So in strict terms, either the original Walrasian prices equal costs condition, or the marginal productivity theory, is redundant. Modern general equilibrium analysis does not rely on marginal productivity analysis, but on activity analysis, so both Walrasian classical equilibrium conditions markets clear and prices equal costs reinstated. In short, what Walras does in a consistent way is to determine the relative prices of commodities, of goods and services, that can either be used to produce other commodities or be directly consummed, under conditions of general equilibrium in a pure free market economy. The Walrasian long term equilibrium where markets clear and prices equal costs, corresponds to the Smithian/Ricardian long term. Monetary phenomena is irrelevant in this world and the Walrasian treatment of the demand for money is arbitrary. Nevertheless, in addition to his theory of prices, Walras introduced a theory of capital that is essentially different from the classical perspective on the valuation of capital.

Walras made the value of capital a function of the profits on capital, an analytical step of tremendous theoretical consequences for the classical political economy approach that conceived the value of capital on a cost or price basis and the profit rate as a simple result of dividing two independent magnitudes: profits and capital. Of course, this was not a new idea in general, merchants and financiers had been discounting commercial and financial paper for centuries,

governments had been selling annuities and perpetuities for centuries as well, and markets to trade bonds and equities had been operating long before Walras made his point[88]. What is of interest is that Walras tried to analyze together for the first time, the simultaneous determination of the prices of commodities and of the prices of capital, depending on profits and as something different from a commodity. Walras introduced a distinction between the prices of final consumption commodities, constitutive of what Walras called 'circulating capital or income', and of all capital goods, what he termed as 'fixed capital or capital in general' defined as 'all forms of social wealth which are not used up at all or are used up only after a period of time.' By so doing, Walras was the first economists to advance the critical distinction between stocks of resources and the flows of services or income generated by them.[89] Walras posited that the prices of capital goods are rigidly proportional to their net yield at given interest rates, that is, the price of a capital good is equal to the net present value of its future returns discounted at a given rate. Walras' theoretical problem was the determination of the prices of capital goods considering as given the future profits derived from its

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[88] Taxation, that is the existence of future more or less predictable revenue streams, provided the basis for the earliest systems of public debt. The Venetian public debt was secured on the state tax monopoly. In Genoa the future salt tax revenues, were sold at auction, and in the 15th Century this process was put under the control of a quasi-public bank: the Casa di San Giorgio. In Florence a similar system evolved where the Monte Commune administered the debt of the state. The claims on the Monte could be transferred, sold, to other citizens freely or with authorization to outsiders. North European city states sold perpetual, redeemable or life annuities. Over time all over Europe, investors lent money, capital, to the state in return for a future stream of income. This posed several crucial problems: the valuation of these claims, that is, the present value of future returns; and the creation of the institutions to manage the system which resulted in the 17th Century in the appearance of the public bank to manage the state's debt and of forms of money different than coinage. The appearance of public debt was inextricably linked to forms of tradeable private equity on monopoly mercantilist, or early capitalist, companies like the New East India Company (1698), the United East India Company (1708) and the South Sea Company (1710). "...the collapse of the Bubble [South Sea Company shares] revealed to investors the sad fact that share prices can go down as far as they can go up...To bail out the many investors who had exchanged annuities for South Sea shares, the government converted most of their holdings into new perpetual annuities paying 3 per cent. The South Sea annuity was followed by the first Three Per Cent Bank Annuity in 1726...After the Consolidating Act of 1751 the Government itself could issue what became known as the 'consol," the forerunner of the modern "gilt."[...] "...the annuities of the pre-1720 period had been illiquid, irredeemable and with a ninety-nine-year term, consols were liquid, redeemable at par but otherwise perpetual...an investor...could be confident of receiving the specified percentage of his nominal capital, paid twice yearly, for ever, or until he wished to sell. The risk that the selling price would be far below what he had initially invested certainly existed, but it soon became apparent that it was a significantly smaller risk than for any similar asset. Consols became a byword for financial security, the benchmark against which all other investments' riskiness came to be measured." Ferguson, Niall. "The Cash Nexus" Money and Power in the Modern World, 1700-2000. Basic Books, 2001. Pp. 111-12.
[89] The assertion that Walras was the first economist to clearly draw this distinction is from Blaug (1978) p. 612. Kalecki would jokingly define economics as the science where stocks and flows would be continually confused.

use, which would be equal to the known net annual rentals and/or equal to their perpetual net yields, the question then was reduced to the determination of the appropriate discount rate. On this Walras commented that he had looked in vain for the market where such rate was established. He settled for the interest rate. In the Walrasian long term equilibrium, residual profits would be zero, and prices will be equal to costs, á la Smith, and they would include the cost of the capital funds employed in production, that is the rate of interest. Of course, Walras was not aware of Hahn's argument that the classical long term equilibrium the economy was demonetized.

To solve the problem of the indeterminacy of the interest rate Walras invented a homogeneous good E, standing for a 'slab of perpetual income' per unit of time. Each household would have a demand function for this 'good' that represents in efect demand for new capital goods, the price being the reciprocal of E, $1/E$, or the interest rate, the higher the yield of capital goods, the lower the price of E and the higher the demand for rights to perpetual income. In pure competition and thanks to the equimarginal rule that makes the net yield of capital goods proportional to their price, the unknown prices of capital goods become a single price, the price of E. Walras treated all capital goods as if they were **'consols,'** that is fixed rate perpetuities, reducing the problem of the determination of the value of capital, to that of the valuation of a perpetual known given yield, that is in modern terms, of a future equal perpetual cash flow. Of course, the most interesting question would be if we can determine under general equilibrium conditions the future cash flows of different firms, but Walras did not ask this question. By considering the yields as given and with the price of capital as the unknown, the only variable left to determine in general equilibrium was the economy's profit rate, which in Walras' solution corresponds to the interest rate. In equilibrium, the interest rate would be determined in the money market by the interaction of the demand of liquid real monetary balances that society wishes to hold and the existing stock of money. Hahn's point applies.

Walras did not provide a theory to explain the demand of new capital goods, that is a theory of investment or capital accumulation. The Walrasian treatment of the demand for capital goods as if they were 'consols' implied a vision of homogeneous capital goods, reduced to a single entity, measured in money and with a single price. By doing this Walras assimilated capital to money, and profits to interest payments, generating an evident circularity in his analysis, E, a 'slab of perpetual income', and its reciprocal $1/E$, the interest rate, are not separate independent variables. Walras initiated the custom of treating the demand for securities, for example his E, a unit of a 'consol,' as the demand of any other consumption good, and he did the same thing with the demand for money to hold. Walras' theory is a theory of the relative prices of commodities, and unless we think that capital and money are essentially the same as any other commodity, that is simple goods: 'cash goods', 'equity goods', 'debt goods', etc. Money and capital have no place in the Walrasian proposal. Needless to say, this is an argument for the proper analytical integration of money, capital and of financial markets to a general equilibrium framework recognizing their essential differences from commodities markets. Not an argument against it. The fundamental contribution of Walras in this respect is that he recognized, in contrast with the classical approach, that the value of capital was a function of future profits discounted at the proper rate, and that for the first time in economics he tried to determine the value of capital as defined, the interest and/or profit rate simultaneously within a general equilibrium approach. Even though Walras did not break completely with the classical vision of capital in strictly physical terms, the fact that he dealt with capital as if it was a security, a property right to future income that could be bought and sold, was a step towards a strict financial conception of capital. Nevertheless, it should be clear that in the absence of a theory that demonstrates how in a long term equilibrium, where Walras' market clearing and zero-profit conditions hold, a positive value of money and hence of the interest rate, and hence of capital, can be sustained, we are back in the Ricardian long term equilibrium. In the Walrasian world, if the economy is not in such an ideal end point, profits appear as a residual, and we

can determine the prices of capital goods given the interest rate, only because we assume we know their future returns. An assumption that is quite close to the Ricardian short term, where profits are determined as a residual because we consider total output and the level of wages as given. An extreme simplification of Walras' world, from the perspective of our reconstruction of the classical theoretical system, would say that Walras determines total output by considering profits on capital as given, and the remunerations of land and all types of labour, as rents, determined á la Ricardo.

Walras did not achieve an integrated analysis of the commodities and the financial markets, he simply treated financial assets, including money, in the same way as any other goods. Nevertheless, there is a fundamental expansion of the domain of the classical theoretical system by Walras. This is the introduction of the problem of the determination of the value of capital from outside the system, based on its future returns and dependent on a discount rate. The moment we admit that the valuation of property rights on capital as a security, can be different from the cost or the price of the commodities used in production, a completely new set of economic problems emerges. From a Lakatosian perspective this classifies as a substantial increase in the empirical content of economics compared to classical political economy. There is an instance of rupture, yes, barely developed, with the traditional view of capital as a thing.

Building on some of Walras' contributions, Irving Fisher[90] in his classic "The Theory of Interest" developed the idea of capital as a fund of purchasing

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[90] Irving Fisher "Theory of Interest" (1930), "The rate of Interest" (1907 and 1930). He can be considered the grand father of modern financial economics thanks to his work on investment appraisal. For Fisher the interest rate is governed by the interaction of two forces: a) the willingness of individuals to give up income now in exchange for income tomorrow, that is "time preference" a term invented by him; and b) the "investment opportunity principle," the technological possibility to convert income now into income in the future. What he called the "rate of return over cost" which for Keynes corresponded to his "marginal efficiency of capital" and in modern financial economics has been developed into the concept of the "internal rate of return." Fisher defined his "rate of return over cost" as that discount rate which equalized the present value of the possible alternative investment choices open, showing that the ranking of alternatives depended on the interest rate. Changes in the interest rate may result in changes in the ranking of alternative

power whose value is determined by the present value of its discounted future returns. In Fisher, contrary to the ideas of the Austrian Theory of capital, the value of capital has not a direct relationship with either the volume of the stock of physical capital or, with the structure of physical capital goods. Á la Walras the value of capital depends only on its future returns, not considered as a given, but determined by the physical marginal productivity of each capital good in particular. Fisher defined as capital, any stock that could yield a flow of income over time and income as the surplus of these services above those necessary to maintain and to replace the stock of wealth. Fisher postulated that in general, there are as many own-rates of interest in an economy as there are products produced with the aid of capital goods, and only in a stationary equilibrium a single interest rate would coincide with the many different own-rates of return. Fisher also postulated that only through a general equilibrium approach this theoretical problem could be solved. Following on Ricardo's steps, Fisher only developed his theory in a one commodity world, which nevertheless, was for him only the starting point of a complete general equilibrium analysis that was not developed.

To avoid an index number or aggregation problem, Fisher considers a one sector economy where physical capital is perfectly homogeneous and a unit of it earns a rental of n dollars per period. There is only one physical good selling at a price of p dollars per unit and it is either consumed or used as capital in the production of more of itself. If the production function is $X = f(K,N)$ the stock of capital under perfect competition, will be used as an input until its marginal value product equals its money rental flow per period.

$p(dX/dK) = n$

The expected annual return minus the annual running costs and depreciation charges, is the net current product of the capital good, and this is

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investments. The modern concept of the internal rate of return is that discount rate that equalizes the net

equal to its money rental per year. Dividing by the price of a unit of final output, we obtain:

$$dX/dK = n/p$$

The present value of this real rental in real purchasing power, considering the case of a perpetuity, that is as a consol, for simplification, would be $(n/p)(1/r)$. Of course capital can be bought and rented so competition would ensure that the price of capital will be equal to the present value of the expected stream of rental payments. Thus in general $(n/p)(1/r) = pk$, and in this particular case $pk = p$ because output and input are the same commodity. Therefore, $n/pk = r$: the real capital rental per period n, or the money rental of a dollar's worth of capital, equals the marginal productivity of capital in physical terms. The rate of interest enables us to determine the price of a capital good from given annual rentals and viceversa. If the annual rental of a capital good is $1,000 and the interest rate is 10%, the capital good would sell for $10,000. In competitive equilibrium the marginal physical product of capital will be equal to the annual money rental of a representative capital good divided by its price, the so-called 'real own-rate of interest' of the product in our one sector economy. Under conditions of perfect arbitrage and with a constant price level, this own rate, determined in real terms, will equal the money rate of interest. Á la Ricardo monetary forces will affect the rate of profits, only temporarily at most, and in equilibrium the real rate of return will determine the money rate of interest. Without fully developing a general equilibrium multi-good model, Fisher postulated that only in a stationary equilibrium a single interest rate would coincide with the many different own-rates of return.

A key element that is missing from the previous argument is that capital goods are produced, and machines are reproducible commodities just as any other. So what about the supply of capital goods? The above argument says

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present value of a series of future cash flows to zero.

nothing about the supply of capital goods. It should be clear that as long as capital goods can be produced at a cost that is lower than the present value of its future returns it will be profitable to increase its production, and if the cost of production of the capital good is higher than the present value of its future returns, nobody will acquire it. So in essence Fisher is not talking about a capital good that can be produced, he is talking about capital as if it was land, an irreproducible asset. If not, in equilibrium the cost of production of the capital good must be equal to its price as determined based on its expected returns. That is, the machine that sells for $10,000 as determined by the present value of its future returns, if the theory can be consistent, must have an equilibrium price that equals its cost of production which of course must include as the capital cost the 10% interest rate that we are trying to determine in the first place. If we consider that capital goods are produced and introduce the Smithian/Walrasian condition that prices equal costs, we have to determine the interest rate somewhere else and then the rental of the capital good will be determined by the interest rate not the other way around. Which is the Smithian way: In equilibrium the price of the capital good should reflect only the production costs including the 'normal profits' in this case, the interest rate. Regardless of its "physical marginal productivity", whatever this is, and if it can be something determined on its own.

The returns of a capital good, a machine, a building, a stock of raw materials or intermediate goods, are not independent of its use. The same physical capital good, can have totally different returns in different activities producing different things, in different geographical locations, even in different factories with different operators, among other possibilities. A machine, and the same is applicable to a person or to any productive service, will be more or less productive in different settings, with different combinations of factors and in different market conditions. What really counts and what enters into the calculations of entrepreneurs when evaluating an investment opportunity is the total expected return of the investment project, which seldom very seldom, consists of acquiring a particular capital good in isolation. In the real world, and I

do not see any good reason to do it differently in the theoretical world, entrepreneurs evaluate their investment opportunities based on the returns of an investment project as a whole. They confront market prices and chose among productive packages, vectors of technically feasible combinations of productive services: labour, managerial talent, machines, etc., etc. The demand for productive services is derived from this selection. With respect to the prices of the commodities that enter in these technically determined vectors, they are determined by general equilibrium conditions just as any other market price, be it for final consumption or as an intermediate good or service, or as a capital good. Investment projects usually span a long time horizon, firms have to discount the future flow of productive services to arrive at their present value for deciding wether it would be worthwhile to buy or hire such commodities. Given the prices of these commodities, firms will know the costs of the planned operation; after estimating the projected future returns from the use of these productive services, they can calculate the project's 'rate of return over cost' á la Fisher, or estimate its internal rate of return, or calculate the net present value of their project using the 'appropriate' discount rate. Facing a going rate of interest in the financial market, they can decide wether or not to undertake the investment, and wether to finance it by borrowing, or by drawing on internal funds, depending on the internal rate of return or on the net present value of the project. This is maybe the most important contribution of Fisher, the rigourous definitions of the instruments to evaluate and to appraise investment opportunities and future cash flows, or in other terms, to determine the value of capital.

Modern general equilibrium analysis is an extension of Walras' and Fisher's contributions. The contemporary analysis of the existence, optimality and stability of general equilibrium in a free market competitive economy, were already considered by Walras. General equilibrium theory is concerned with the interactions of many individual agents in an economy. A competitive equilibrium in modern analysis is defined usually as the state of affairs in which: each consumer maximizes her satisfaction given her budget set defined by the

prevailing price[91] vector; each producer maximizes her profit given the same price vector; and, the total supply of commodities is equal to the total demand for commodities, or Say's Law. This last equilibrium condition is known in the modern literature as Walras' Law:[92] "supplies equal demands: markets clear." The second classical and Walrasian long term equilibrium condition that prices equal costs is often subsumed acritically to the first. As we know the market clearing is not the only equilibrium condition considered by Walras, but the one used by most modern analysts, except those that use models where due to price rigidities markets do not clear, but that is another story. The existence of 'equilibrium' depends on whether or not there is a price vector that can sustain the above described state of affairs. In other words, the consistency of the concept and the model of a competitive economy is concerned with the question: are the actions of numerous competitive producers and consumers consistent with each other? If they are, then an equilibrium can be achieved in the form of a system of prices that sustains it. In a situation of equilibrium consumers and producers will not face an incentive to do something different from what they are doing and given the circumstances they are doing the best they can.

The classical questions of general equilibrium analysis, or welfare economics, are whether every competitive equilibrium realizes a Pareto optimum, that is a situation where no agent can increase her satisfaction without decreasing someone else's, and whether a Pareto optimal state can be achieved and supported by a competitive equilibrium. Of course, if both questions can be answered positively as it is the case in the literature, then the definition of the precise conditions which support each proposition becomes crucial. These questions are at the center of the emergence of economics as a scientific discipline since the times of Adam Smith. Smith had a brilliant economic intuition about the relationship between free competition and the optimization of social

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[91] As we know, prices are relative prices, that is rates of exchange between commodities, expressed in the appropriate unit of account, or numeraire.
[92] The term was introduced by Oscar Lange, several commentators have questioned the validity of this name considering that it is formally equivalent to the ancient Say's Law of markets, however the term has taken hold in the literature and I'll use both indistinctly.

welfare, but without any conceptual precision. It was until Pareto that the concept of *Pareto Optimum* was introduced. After initial reformulations and contributions by Lerner, Lange, Hicks, and Samuelson, the first rigorous formulations and proof of these propositions was completed by Arrow and Debreu,[93] A&D. After A&D seminal contributions, other modern authors have simplified and perfected these expositions. We refer the interested reader to the sources for the detailed mathematical proofs that under certain conditions a competitive equilibrium will realize a Pareto optimum and that a Pareto optimum can be achieved and is supported by a competitive equilibrium. One could never use general equilibrium models", GEMs, confidently, as a fundamental tool of theory building, if it was not clear that they have a solution.[94] General equilibrium analysis has shown that pure free markets can be an extremely efficient way of allocating resources and organizing economic activity, within a set of perfectly defined conditions and within a given institutional framework. Of course, the issue about the correspondence of real life economies to these models is another quite different question. As Jaffé[95] correctly pointed out, the economies portrayed in general equilibrium analysis are not modern capitalist economies. General equilibrium models do not show *how* a capitalist system works, but how an imaginary free market system *might* work in conformity with certain principles.

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[93] The first successful formulation and proof of this problem is due to Arrow and Debreu. (Arrow K. J. And Debreu, G. "Existence of an equilibrium for a Competitive economy." Econometric, 34, January 1966.) "The essential idea is to consider the model of competitive markets as the model of an n-person non-cooperative game and to utilize a theory developed in game theory." This is the essence of the modern formulation of the existence question. In Koopmans words: "The problem is no longer conceived as that of proving that a certain set of equations has a solution. It has been reformulated as one of proving that a number of maximization of individual goals under independent restraints can be simultaneously carried out." The usual procedure is summarized as: "...we first specify the consumption set for each consumer, the production set for each producer, the behavioral rule for each economic agent, and a competitive equilibrium. Then, using the assumptions on the consumption set and the production set, and so forth, we want to prove the existence of an equilibrium. The problem is no longer one of finding a solution for the simultaneous equations or inequalities. The stress now lies in the compatibility of each economic agent's behavior." Takayama, Akira. Mathematical Economics. 2d. De. (P. 261).

[94] It is known that the Walrasian system possesses a economically meaningful, unique solution, provided that: a.- returns to scale are constant or diminishing; b.- there are no externalities in production or consumption; and, c.- all goods are 'gross substitutes' for each other, that is the rise in the price of one good will produce positive excess demand for the other.

[95] Cited by Currie and Steedman in "Wrestling with time" Problems in Economic Theory. P. 67. See also W. Jaffé, "Walras' Economics as Others see It" 1980. Journal of Economic Literature 18. pp. 528-58.

The economy portrayed in these models has two types of economic agents "producers" and "consumers," a particular individual can be a producer and a consumer simultaneously. Markets are competitive and free in the sense that each economic agent is small relative to the size of the economy, there are no barriers to entry and the impact of the individual agent's actions, as a producer or consumer, on market prices are negligible. There is a large number of individual agents, every tradeable good or service, is a "commodity" defined by its physical characteristics, its availability location and its availability date. The behavioral rule for consumers is that each consumer maximizes her satisfaction over the set of commodity bundles that she can afford to buy with her income. Each producer maximizes her profit using the process or processes available in her production set. The approach followed is that of activity analysis.[96] As we said before, modern general equilibrium, GE, analysis of consumption and production does not use, require or invoke, vulgar marginal value or distribution, theories and/or micro or macro production functions.

General equilibrium models, A&D type, are characterized by the existence of a full set of futures markets that perform the role of intertemporal allocation. Every commodity is dated, that is, defined by its description and by its delivery date. The typical household endowment consists of commodities—including heterogeneous labor or human capital services—dated for availability in the present (spot) and in the future, it consists of both current and future goods. Following the Walrasian tradition: there is a single date of active trade, trade takes place in dated commodities: current goods spot and futures contracts (goods contracted for delivery in the future). This is the way the intertemporal allocation process works. Each household would receive abstract purchasing power to be credited toward its purchases on the market, in exchange for sales of its endowment. It would then purchase spot goods for current consumption and contracts for delivery of future consumption. As Starr expressed it: *"The*

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[96] The production set of a competitive producer is a convex polyhedral cone: every *efficient point* under a fixed price vector is a *profit maximization point* and vice versa. The maximization point of all maximization points is the origin.

household goes to the market with a portfolio of securities representing its endowment and when all trades have been completed it leaves the market with a portfolio of securities representing its lifetime consumption plan.[97] Hence, the household budget constraint, is a lifetime budget constraint expressed in terms of present discounted values of sales and purchases, where the value of all its purchases must equal the value of its sales. A crucial point in this model is that *current prices are present discounted values of dated goods.* In the spirit of the Fisherian analysis, each dated good's future price is discounted by its own-rate of interest, which in the model is directly derived from the prices of the same commodity between two dates, own-rates of return or interest for different commodities are not equal. Given that current and future prices are determined by spot and future markets, these last identical in A&D, the so-called own-rates of interest, which are nothing more than the per-cent relationship between these two prices of the same dated good, are of very little or nil theoretical interest,[98] i.e. agents do not react to them. Of course, when someone says lightly that *the* profit rate or *the* interest rate problem, is solved in general equilibrium through the use of dated commodities, it is evident that has problems understanding both.

The logic of this pure free market economy does not require debt instruments or capital markets characteristic of a modern capitalist economy. This is because futures markets allow the timing of household consumption to be allocated independently of the timing of sales by the household endowment. In this economy futures markets perform two quite distinct functions: Price determination, all agents know the trade-off between present and future consumption and between goods at a variety of dates. And, a 'capital market' function, allowing every household to arrange its desired consumption plan from the present to the future, subject to its lifetime budget constraint. The result is Pareto efficient in terms of household lifetime utility functions, and as firms

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[97] See "General Equilibrium Models of Monetary Economies" Studies in the static Foundations of Monetary Theory" Ed by Ross M. Starr. Academic Press, Inc. Harcourt Brace Jovanovich, Publishers. 1989. P. 5.
[98] Of course, own rates of return can be positive, negative or zero. The price of a personal computer, lets say 1, or 5 years from now most likely is going to be less than today, so the corresponding own-rate will be negative.

maximize their profits they minimize costs so it is an efficient allocation too. Once all trade is realized at the initial date, economic activity is simply the fulfillment of the contracted plans. Under these theoretical conditions markets do not need to open at subsequent dates, there are no desired net trades. The trading mechanism in an A&D type GEM is simplified in a way that implies that there is no role for a medium of exchange, money, in the trading process.[99] Money is only accounting money, a simple *numéraire,* the interest rate as we usually know it, what the classics dealt with and what Greenspan moves, has no role or place in these models. Profits are either assumed and considered as given payments to specific firms for the use of non-specified resources only available for a firm in particular, or if not, equal to zero. The profit rate as an equal yield on capital, whose existence was an obvious fact for the classics and whose theoretical elucidation was crucial, is absent. Nevertheless, the existence of multiple own-rates-of-return is hailed as an achievement in terms of generality. A strange assertion, of course, general equilibrium models are essentially a particular case, they are the modern version of the Smithian/Ricardian long term equilibrium, where markets clear and prices are equal to costs, either with zero profits or frozen profits different for each firm, at an assumed arbitrary level. One important point I want to stress here, without developing it further, is that the idea of profits as frozen payments to firm specific resources that are not defined, often used to determine in general equilibrium setting prices and positive profits, is logically equivalent to the short term Ricardian scenario but considering as given these residual profits instead of total output. In my view such a general equilibrium with positive frozen profits, should be considered as a temporary general equilibrium. The main thing general equilibrium models do, is to determine the relative prices of commodities in a logically consistent way, under determinate given

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[99] All trade takes place between the individual and an abstract market. There is an abstract price formation mechanism, sometimes personified as the Walrasian auctioneer. Once general equilibrium prices have been announced, agents deliver their excess supplies to the market and withdraw their excess demands, consistent with budget constraint. Inasmuch as prices are market clearing, there is no unsatisfied excess demand. The agent's trade is a single transaction, the delivery of goods and withdrawal of demands. (Record keeping is required, so budget constraints are fulfilled, but there is no explicit account in the model of it). Since each agent and firm's transaction takes place in a single exchange, there is no role for a token or carrier of value to be held between transactions, hence no role for a medium of exchange. In Starr's

circumnstances. Which is a lot. They solve, in my opinion correctly, the problem of the relative prices of commodities, and provide the theoretical system of classical political economy with the consistent theory of value it lacked. No more but no less. In my view the repeated attempts at dealing with all the problems of the domain of political economy as defined, only from the perspective of the theory of value are misguided[100].

Summarizing, the classical theoretical system, among other problems, lacked a consistent theory of value, the general equilibrium approach initiated by Walras and eventually perfected by the contributions of Arrow, Debreu and Hahn, among other modern theorists, filled this gap. Now the theoretical problem of the determination of the relative prices of commodities irrespective of their use, under conditions of a pure free market equilibrium, can be considered as solved at least for the long term scenario. The modern general equilibrium approach to value theory does not require a marginal productivity theory and does not depend on the use of micro or aggregated production functions. A theory and an approach inextricably linked, whose validity was terminally questioned during the capital controversies. If we take seriously the generally accepted conclusions of this debate, where the best and brightest economists from the main currents of contemporary economic thought participated, profits cannot be considered as a cost or as a payment for the marginal productivity of a physical entity called

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words:"The perfection and simplicity of trade in the model preclude a role for money as a facilitator of transactions. You can't improve on perfection." (Starr,1989. p. 5)

[100] For example: Until now, more than 130 years after the first edition of the *Elements of Pure Economics or the Theory of Social Wealth* published in installments between 1874 and 1877. Around 70 years or so after the time when Prof. Hicks was urging the profession to "look at the frictions in the face" in order to integrate value and monetary theory, and deal with the "inherently formidable difficulties" of the dynamics of a modern monetary economy. The substantive advances in this route are the introduction of transaction costs that provide a role for money as a medium of exchange, and the maintenance of a positive price of money in equilibrium through **exogenous structures**: expectations of future positivity, and the demand created by taxes payable in money. "In a fiat money economy this is a question that needs to be addressed. Inasmuch as the money is not desired in itself, there is always a possibility that its price will fall to zero, effectively demonetizing the model. Note that the usefulness of money and positivity of its price are not logically equivalent. When the price is zero it is surely useless because it has ceased to be money; when the price is positive, positivity is maintained not by its usefulness but rather by exogenous structures. Sufficient conditions for positivity are expectations of future positivity or the demand created by taxes payable in money." [...] "A full analytic rationale is presented for the use of a medium of exchange, for the use of a store of value, and for the holding of idle balances in equilibrium...by explicit modelling of the structure and difficulties of trade, a powerful class of models that had denied a role to money and finance has been shown to provide their foundation." (Starr, 1989. p. 344)

capital, the rate of profits cannot be simply assimilated to the interest rate or viceversa. The frequent practice in general equilibrium analysis to consider profits as 'frozen' payments to firm 'specific' resources that are not traded as every other commodity is, constitutes an arbitrary assumption. Such a general equilibrium solution, that determines all prices of commodities, plus positive profits as 'frozen' payments to firm 'specific' resources, can be accepted as most as a temporary equilibrium where markets clear but prices differ from costs, so in strictly classical terms profits appear as a short term residual.

With respect to capital, its value cannot be determined simply by the aggregation of the prices of its constitutive parts; not as a production cost inclusive of interest á la Smith; it cannot be determined by its given yields discounted by the interest rate, á la Walras; it is not determined by the physical marginal productivity of capital goods. The value of capital is determined by the future residual profits or returns, that a particular firm or activity can yield. Capital is the tradeable property right on these profits, it is not a thing, it is an entitlement. The value of capital is distinct from the value of the commodities that are used to generate profits, and the mechanisms to determine the prices of commodities, general equilibrium conditions, and the prices of capital, present value of future discounted profits, are essentially different as well. Of course, from a scientific perspective they need to be integrated in the same theoretical system, and determined simultaneously. If capital depends on profits and profits are not a cost, then profits as a residual can only emerge in conditions different from the Smithian, Ricardian and Walrasian long term full equilibrium. So we need a theory to explain how can levels of wealth or output, that are different from full equilibrium can be achieved. If we can determine present and future residual profits, then to determine the present value of capital we need an appropriate discount rate, here we either assume a zero present value and determine an internal rate of return, or use the interest rate as determined in financial markets as the appropriate discount rate. Given that capital is essentially a fiduciary phenomenon we need an integrated theory of commodities

and financial markets. The problems of money, the interest rate, capital and financial markets in general, cannot be dealt with solely from inside value theory[101], the consideration of exogeneous structures is required. This conclusion is shared by general equilibrium theorists like Starr, among others, and by Sraffa and followers, and it is a conclusion that should not surprise anybody: every logical system is incomplete, to consider otherwise is to pursue Hilbert's programme in economics. John Maynard Keynes was the first economist to visualize the need of a general theory to deal with some of these problems.[102] Problems that can derived directly from the deductive structure of the classical theoretical system we have reconstructed.

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[101] Monetarists like to think that price theory is the crucial or the only paradigm that economics has to understand aggregate economics, and that this theory can be used to explain the whole range of social phenomena. The New Classical have their own particular ideas about the only paradigm in this respect as we will see. I believe that there is a confusion with the use of some the principles of price theory, for example: individual rational behavior, and price or value theory itself. Of course, the different theories that are needed to complete the theoretical system of the classics, need to be consistent with each other, and share the same basic principles. Principles that constitute the non falsifiable or non refutable hard core of the discipline, as different from the authentic hard core that can be refuted. (See Section 1.)

[102] "Thus the analysis of the Propensity to Consume, and the definition of the Marginal Efficiency of Capital and the theory of the Rate of Interest are the three main gaps in our existing knowledge which it will be necessary to fill. When this has been accomplished, we shall find that the Theory of Prices falls into its proper place as a matter which is subsidiary to our general theory." Keynes, J. M., "The General Theory" Pp. 32.

5. The Keynesian challenge and the New Classicals.

Another central problem of the classical theoretical system is: considering that the classicals' long term result is an hypothetical end state of perfectly free markets with perfect institutions. How can we determine levels of actual wealth, or output, that are different from the Smithian ideal end-point? In the short term trades will take place at market prices and wages, rents and profits will differ from their natural levels, but there is no way of telling if we are close or far from the ideal end-point characteristic of the Smithian 'system of natural liberty.' Without rejecting the Smithian long term result, but without proposing an alternative theory of the determination of total wealth, Ricardo dealt with the distribution problem by assuming a given level of total output and demand, that allowed for the existence of positive residual profits, my descriptor for this scenario has been short term. Many contemporary Ricardians like to refer to this scenario as a long term position, however in my view, the true Ricardian long term equilibrium, is the same as the Smithian, but with zero profits[103]. So the Ricardian short term is a

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[103] In the words of Prof. Pasinetti, one of the most distinguished contemporary scholars in the Ricardian tradition: "The notable analytical characteristic of this Ricardian scheme is that, as soon as some notion of capital accumulation deriving from the capitalists' savings out of profits is introduced, this generates an endogenous process of economic growth. The mechanism is really simple: increasing capital induces an increasing demand for workers, which in turn causes wages to increase above subsistence. This (according to Malthusian theses) leads population to growth, making it necessary to extend the cultivation of land. If technology remains unchanged, then extending cultivation of land to the less fertile plots of land, or intensifying the exploitation of existing farmland, leads to diminishing returns as the quantities produced are increased. This in turn generates variations in the proportions of the national income distributed as rent, wages and profits. The total amount of wages (at the "natural" level) can only grow in proportion to the number of workers. The differential productivity gains of the various types of land will also continue to increase as the marginal land keeps on being shifted further out. The total amount of rents will thus continue to increase. The hardest hit by this process will precisely be the members of that social class that Ricardo considered as the most active, namely the capitalists: the (residual) net national income remaining for profits will continue to diminish. Ultimately, there is no way out. The rate of profits will decline until it dries up all incentive to save (and to accumulate capital). There are two channels that may counteract this trend. The first is external, and consists in international trade.[...] The second channel is internal, and consists in improving the methods of cultivating land (i.e. technical progress). All the classical economists acknowledged the importance of improving technology. But, surprisingly, they underestimated its potential, convinced as they were that population growth would eventually outpace all the possibilities of boosting agricultural productivity, and that capital accumulation would ultimately come to a standstill, due to the "euthanasia" (to use a "Keynesian" term) of the capitalists, left with negligible amounts of profits, i.e., too low incomes to have any incentive to save and accumulate. The variation over time of the process of income distribution would thus lead to a "stationary" state, in which the distribution of the income would essentially be reduced to only two relevant shares: wages for the workers (having reached the maximum number compatible with the existing natural resources, but constrained to a bare subsistence wage rate) and rents for the land-owners; the only class to become, and effectively remain, the well-to-do class." Pasinetti, Luigi. "Critique..." Unpub. P. 7-8. See also Pasinetti, (1960). Pasinetti carefully avoids saying that profits are

particular case[104] where all commodities are traded based on equal values, that is Say's Law holds, and all the prices include a uniform rate of profit, and this result is dependent, among others, on the assumptions of a given demand and total output, and that wages are given. For Marx, the dynamism of the competitive markets would propel the economy forward, however, the class struggle around wages and profits in the short term, interacting with the long term trend of the falling rate of profits, would generate continuous instabilities in the economic system, that would make it impossible to achieve the long term positive results of free markets. Of course, Marx was not interested in developing a short term theory of the determination of output, his interest was in the proletarian revolution. Nevertheless, Marx advanced the notion that the actual level of employment depended on the volume of physical capital that could be profitably employed, and this is an important theoretical point.

In short, the classical theoretical system lacks a theory for the determination of wealth at levels different from a Smithian ideal long-term

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ultimately zero, but that is the obvious conclusion, needless to say in the stationary state managerial wages are positive. Also, the bare subsistence wage rate is not a necessary conclusion, it is simply an assumption.
[104] The consideration of Ricardo's theory of distribution as a particular case of classical economics might offend some scholars that assimilate classical economics to Ricardo. However, I do not see how can it be considered otherwise, by now in my view this point should be clear: how can we determine the distribution of something, wealth, with the character of a general law, if the 'vain and elusive' something cannot be determined? We cannot. We can assume that wealth, total output, is given but then the problem loses most of its interest and practical relevance. And we cannot deny that the Smithian theory, or proto-theory, of wealth determination exists and that it is at the core of the theoretical system of classical political economy. The particularity of Ricardo extends to Sraffa. The consideration of Frank Hahn (1982) that Sraffa's solution to the Ricardian puzzle, can be seen as a particular case of a general equilibrium solution to the long term problem of the determination of relative prices and the total level of wealth, has infuriated a couple of generations of scholars of the Ricardian/Sraffian lineage. But have they proposed an alternative to the Smithian free market pricing mechanism? No. And it is precisely this mechanism the underlying assumption that permits to derive logically the conclusion that under certain given particular conditions, commodities are traded at prices that reflect the exact same profit rate economy wide, which is what Ricardo tried to show. Until now Sraffa's vision is still at the 'prelude of' level and I do not think any archeological work on his notes and unpublished papers, by his own decision, is going to change that. As much as I have personally symphatized with his valiant approach, I believe it is time to assume its merits and to recognize its inherent limitations so our discipline can advance as the science it can be. In my opinion, Sraffa's fundamental theoretical contribution, is the discovery of the phenomenon of re-switching of techniques, this demonstrated the invalidity of the general application of the equimarginal principle to production, as it is the case in the now prevailing and extended acritical use of aggregate production functions to 'study' almost every conceivable problem in economics. Nevertheless, Sraffa's solution to the Ricardian problem of the determination of relative prices and of the profit rate is indeed a particular case. Marx also describes such a process clearly in his analysis of the equalization of profit rates, in the formation of the so-called prices of production, and Marx's results imply necessarily pure competition and a general equilibrium approach. As Marx expressed it, without the assumption that the sum of the profits must equal the sum of surplus-values,

equilibrium, or to use a modern expression different from 'full employment.' Walrasian general equilibrium and production function analyses share this characteristic. Here we either consider this a non-problem and assume that the economy is always more or less around this ideal level, save for random shocks, well intentioned government policies that cause more harm than good, workers that decide not to work more out of their own volition, or similar causes that can push the economy away from its natural position and path of growth. Which is the stance of the so called New Classical economists or third generation monetarists. Or, if we consider that the determination of the level of output at different levels than the Smithian ideal end-point is a real theoretical and practical problem, then an alternative theory is required. Such a theory would require, either: The rejection of Say's Law[105], and with it, implicitly or explicitly, the associated free market mechanism and to present an alternative theory of wealth determination and of competitive markets. Or as Clower expressed it would require an 'alternative theory of household behavior.' This line of thought is at the center of the Keynesian research programme: Say's Law is rejected and the principle of effective demand is the proposed alternative. The other option, which is the path I will follow in my research programme, would be to develop a theory that integrates Say's Law and the workings of competitive markets, in a wider framework that admits a continuum of general equilibrium positions, where the

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and the sum of prices of production must equal the sum of its values, 'political economy would be without a rational basis'. Capital, Vol. III, Chap. 10.

[105] "...if Keynes seriously meant to question the validity or relevance of Walras' law, he would have to reject the orthodox theory of household behavior and propose an acceptable alternative--and the alternative would have to include orthodox theory as a special case, valid under conditions of full employment. Walras' law is not, after all, an independent postulate of orthodox analysis; it is theorem which is susceptible to direct proof on the basis of premises which are typically taken as given in contemporary as well as classical price theory." [...] "...*either Walras' law is incompatible with Keynesian economics, or Keynes had nothing fundamentally new to add to orthodox theory.*" p. 41. "...suppose that Walras' law is both unreservedly valid, relevant and compatible with keynesian economics...(then) Keynes may be subsumed as a special case of the Hicks-Lange-Patinkin theory of *tatonnement* economics...We would then have to conclude that Keynes added nothing fundamentally new to orthodox economic theory."[...] "If Keynes added nothing new to orthodox doctrine, why have twenty-five years of discussion failed to produce **an integrated account of price theory and income analysis? If Keynes did add something new, the integration problem becomes explicable; but then we have to give up Walras' law as a fundamental principle of economic analysis.** It is precisely at this point, I believe, that virtually all previous writers have decided to part company with Keynes. I propose to follow a different course. I shall argue that the established theory of household behavior is, indeed, incompatible with Keynesian economics, that Keynes himself made tacit use of a more general theory, that this more general theory leads to excess-demand functions which include quantities as well as prices as independent variables, and that, except in conditions of full employment, the

Smithian ideal end point is just one of them. Such a general equilibrium approach would require the adoption of the two classical equilibrium conditions, in the short and in the long term: Say's/Walras' Law, and, in the long term only: prices equal costs. This will allow us, among other to consider profits as a residual determined in real terms, as a temporary[106] general equilibrium phenomenon. Before a brief consideration of Keynes' analytical proposal is required.

John Maynard Keynes[107] and his theoretical challenge of 'classical economics' is still today, in one way or another, at the center of the debates about modern macroeconomics, aggregate fluctuations of employment and output, stabilization and financial policies, etc., etc. Almost everybody would agree on this, needless to say for some the invocation of Keynes is a summons for eternal rest,[108] and for others for a second coming.[109] Both loose groups

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excess-demand functions so defined do not satisfy Walras' law." p. 43. Clower, Robert. "The Dual-Decision Hypothesis"

[106] The term is used by Hicks, a temporary equilibrium is a situation where markets clear, Say's Law or Walras' Law holds, but the economy is not in full employment. It is out of the full employment growth path.

[107] I will concentrate solely in John Maynard Keynes, "The General Theory of Employment, Interest, and Money" First Harvest/Harcourt Inc. 1964. All the qoutes are from this edition.

[108] In the words of the leader of the New Classical Economists Robert E. Lucas, Jr. : "The most interesting recent developments in macroeconomic theory seem to be describable as the reincorporation of aggregative problems such as inflation and the business cycle within the general framework of 'microeconomic' theory. If these developments succeed, the term 'macroeconomic' will simply disappear from use and the modifier 'micro' will become superfluous. We will simply speak, as did Smith, Ricardo, Marshall and Walras, of *economic* theory. If we are honest, we will have to face the fact that at any given time there will be phenomena that are well-understood from the point of view of the economic theory we have, and other phenomena that are not. We will be tempted, I am sure, to relieve the discomfort induced by discrepancies between theory and facts by saying that the ill-understood facts are the province of some other, different kind of economic theory. Keynesian 'macroeconomics' was, I think, a surrender (under great duress) to this temptation. It led to the abandonment, for a class of problems of great importance, of the use of the only 'engine for the discovery of truth' that we have in economics." Models of Business Cycles, Basil Blackwell Oxford and Cambridge, MA. 1987. P. 108. Edward C. Prescott, one of the founding fathers of Real Business Cycle theorizing, writes: "The Keynesians had it all wrong. In the Great Depression, employment was not low because investment was low. Employment and investment were low because labor market institutions and industrial policies changed in a way that lowered normal employment." In: "Some Observations on the Great Depression" Federal Reserve Bank of Minneapolis Quarterly Review Winter 1999, vol. 23, no. 1, pp. 25-31.

[109] For example, Paul Krugman in his 1999 book "The Return of Depression Economics" says with Keynesian inspiration: "What does it mean to say that depression economics has returned? Essentially it means that for the first time in two generations, failures on the demand side of the economy—insufficient private spending to make use of the available productive capacity—have become the clear and present limitation on prosperity..." p. 155. Another more recent example is the Nobel prize winner Joseph E. Stiglitz in his 2001 book "Globalization and its Discontents" writes: "The Great Depression enveloped the whole world and led to unprecedented increases in unemployment. At the worst point a quarter of America's workforce was unemployed. The British economist John Maynard Keynes...put forward a simple explanation, and a correspondingly simple set of prescriptions: lack of sufficient aggregate demand explained economic downturns; government policies could help stimulate aggregate demand...While the models underlying Keynes's analysis have subsequently been criticized and refined, bringing a deeper

spanning a continuum built around a centrist consensus based on the neoclassical synthesis of classical and Keynes' contributions, embodied on the IS-LM model, or to use Leijonhufvud[110] term, in the standard income-expenditure model.[111]

Keynes' work was a frontal attack on what he called "classical theory" and it was intended to be a 'struggle of escape from habitual modes of thought and expression'. For Keynes the classics included David Ricardo, James Mill, J. S. Mill, Marshall, Edgeworth and Prof. Pigou, among others.[112] Marx was the one who coined the term 'classical economists' and other than that, for Keynes, a member of the 'underworld.'[113] Keynes mentions Walras only once in the General Theory, in connection to the classical theory on interest of which he considers Walras one exponent more. It has become a commonplace idea that Keynes' aggregation of such a wide number of scholars under a single heading was, at least, an oversimplification, that classical economics was a straw man,[114] an invention to caricaturize an opponent's argument to more easily refute it. I would agree that no single pre-Keynesian writer or group of writers, personified classical theory. But it would be very difficult to deny that overall the contributions of the founders of political economy or economics as a scientific discipline, have a common domain, a deductive structure constitutive of a relatively well defined theoretical system, a set of common problems to be elucidated, among other elements, that can be termed as 'classical.' I have argued in this essay for such a

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understanding of why market forces do not work quickly to adjust the economy to full employment, the basic lessons remain valid." P. 11.

[110] See Leijonhufvud, Axel. "On Keynesian Economics and the Economics of Keynes" A Study in Monetary Theory. New York. Oxford University Press. London 1968 Toronto.

[111] Clearly this is a quite arbitrary grouping intended only to set the boundaries, so to speak, of the current debate. And, of course, there are other views on both sides of the political or philosophical spectrum of this hyper-simplified description, however they are not central for the purposes of this book

[112] See Keynes, J. M. "The General Theory of Employment, Interest, and Money" pp. 3.

[113] The underworld of those who like Malthus, believed that there could be defficiencies or excesses in aggregate demand, Say's Law did not hold, which clearly was not the case in the work of Karl Marx. See Keynes, J. M. "The General Theory..." p. 32.

[114] "It appears that the body of ideas discussed under the name of 'classical' economics represented a convenient straw man of Keynes' invention to represent the thinking of his predecessors. For Keynes, a 'classical' economist was any writer who defended Say's Law. By Say's Law, Keynes meant the proposition thay any increment in output will automatically generate an equivalent increase in spending and income such as to maintain the economy at full employment." Blaug, Mark. "Economic Theory in Retrospect" (1978) pp. 691.

type of rational reconstruction, with the ultimate purpose to help us progress in our field. In other words, the rational reconstruction of the deductive structure of a scientific discipline should ultimately serve as a tool for the growth of knowledge. The rational reconstruction of the theoretical system of classical economics we have presented allowed us to conclude directly that a theory for the short term determination of wealth or output was needed, that this theory required a consistent theory of profits and capital, and a different but consistent theory of money and the interest rate. I would say that Keynes' straw man, more than a convenient rethorical tool, is a 'rational reconstruction' of the thought of his favorite 'classical' writers.

What Keynes defines as classical economics includes: David Ricardo's idea that there is no such thing as aggregate demand defficiencies, against Malthus attempts to develop a rationale for them; classical price theory based on marginal utility and productivity analysis; and, Pigou's employment theory that advocates the ever present tendency towards full employment. According to Keynes, the great puzzle of effective demand, died with Malthus and not a single word on the issue was to be found in the works of the great representatives of classical theory: Marshall, Edgeworth and Pigou. Nevertheless, Keynes' rational reconstruction covers partially a subset of what I have defined as the domain of classical economics, Keynes' classical theory corresponds more to the neoclassical, Marshallian, tradition of the United Kingdom than to the classical theoretical system as defined in this essay.

Keynes' observation that, "It may well be that the classical theory represents the way in which we should like our Economy to behave. But to assume that it actually does so is to assume our difficulties away."[115] As well as the hyper quoted assertion that in the long term we will be dead, among other similar expressions, indicate that Keynes' was criticizing the views that believed the economy was always in or near the Smithian long term equilibrium; that

prices were always equal to costs thanks to the generalization of Ricardo's rent theory into the marginal productivity of factors theory; that the profit rate was equivalent to the interest rate;[116] that monetary and financial forces did not matter and that the aggregate impact of capital markets could be disregarded. What Keynes termed as classical theory was for him clearly inadequate to deal with the real short term problems of modern capitalist economies.

Keynes' critique of classical economics involved two main issues: First, Keynes questioned the validity of the traditional analysis of the labor market where workers would react to and negotiate their wages in real terms only. Keynes stressed that workers would negotiate money wages but that real wages and total employment would be determined by aggregate forces mainly. Second, at the systemic level Keynes proposed to demonstrate that Say's Law of Markets, was a particular not a general situation of aggregate equilibrium. Say's Law, could be integrated as a special case of the more general systemic principle of Effective Demand. Say's Law would determine total output and employment only at the full employment equilibrium point. The Effective Demand Principle would determine equilibrium in a continuum of points before equilibrium, the characteristic fluctuations of modern capitalist economies, could be traced back to fluctuations in effective demand. Monetary forces and financial markets would play a central role in the analysis. More than on an apparent "money illusion" on the part of workers, relevant for the consideration of the adjustment process of wages and prices, Keynes' analysis relied on the interaction of the interest rate and the profitability of capital, what he termed the marginal efficiency of capital, interaction that would determine the level of investment, employment and aggregate demand. And an interaction that could, in Keynes' vision, generate

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[115] John Maynard Keynes. "The General Theory of Employment, Interest and Money" pp. 34.
[116] "I was brought up to believe that the attitude of the Medieval Church to the rate of interest was inherently absurd, and that the subtle discussions aimed at distinguishing the return on money-loans from the return to active investment were merely jesuitical attempts to find a practical escape from a foolish theory. But I now read these discussions as an honest intellectual effort to keep separate what the classical theory has inextricably confused together, namely, the rate of interest and the marginal efficiency of capital. For it now seems clear that the disquisitions of the schoolmen were directed towards the elucidation of a formula which should allow the schedule of the marginal efficiency of capital to be high, whilst using rule and custom and the moral law to keep down the rate of interest." Keynes, J. M. "The General Theory..." p. 351-52.

significant positive wealth or windfall effects, which may impact the macro dynamics of the economy.

The theoretical debate before Keynes, according to Wicksell, had three main issues pending: capital and interest, monetary dynamics and population.[117] The issues regarding the determination of relative prices of commodities in an exchange economy, that is value theory, were more or less resolved, thanks to the contributions of Walras, Jevons, Marshall, etc., the great neo-classical system builders. However, the issues of capital and interest, or better said of profits and capital, central for the understanding of the systemic dynamics of modern capitalist economies, where far from settled theoretical issues. Keynes did not try to solve these issues for their own sake, we cannot speak of Keynes' theory of capital and the profitability of capital, either as interest or as the marginal efficiency of capital. Nevertheless, in his short term aggregate analysis of the fluctuations of output and employment in a modern capitalist economy, the fundamental variables are the relative prices of labor/wages, capital assets/profits, and money/interest.

Let us briefly go over Keynes view of the problems at issue. Regarding the classical postulates of labor market theory, Keynes expressed: *"The postulate that there is a tendency for the real wage to come to equality with the marginal disutility of labour clearly presumes that labour itself is in a position to decide the real wage for which it works, though not the quantity of employment forthcoming*

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[117] See Leijonhufvud, Axel. "On Keynesian Economics and the Economics of Keynes" A Study in Monetart Theory. New York, OXFORD UNIVERSITY PRESS, London 1968. P. 212. "The issues were not resolved. Keynes' General theory had the effect of cutting the debate short. The capital-theoretic controversies were buried under the avalanche pro-anti, and (soon enough) post-Keynesian writings, and the issues were to remain in abeyance for some thirty years…(Keynes) His main point was that "Classical" interest theory generally dealt with a barter system and ignored the store of value role of money. This point was generally accepted. At the same time, however, Keynes did not achieve a satisfactory statement of his own theory of interest that could be substituted for the doctrines he had sought to demolish. (Critics made it clear that)…Keynes overstated the role of liquidity preference in interest determination. But this criticism did not put new life into the earlier debate on capital and interest. It failed to do so because the reformulation of the "Keynesian system" provided by Hansen and others was widely accepted as a successful "integration" of Keynesian and classical interest theory." In footnote 9 Axel writes: "The "IS-LM formulation" of the matter replaced the Classical economists' "Thrift" and "Productivity"-the exogenous data of the problem—with the endogenous flow rates of saving and investment, and made no reference to the stock concepts of "wealth" and "capital."

at this wage...The traditional theory maintains, in short, that the wage bargains between the entrepreneurs and the workers determine the real wage;"[118] Keynes view was that nominal wages tended to stick and that workers did not react immediately, at least, to changes in real wages, because there was not a mechanism[119] that would allow labor to negotiate in real terms. The fact that changes in the prices of consumption goods affected continuously the level of the real wage and that nominal wages tended to vary less was a sufficient reason for Keynes to question the classical assumptions.[120]

Keynes view constituted an indictment on the explanation of unemployment and its fluctuations by the classics: *"Moreover, the contention that the unemployment which characterizes a depression is due to a refusal by labour to accept a reduction of money wages is not clearly supported by the facts. It is not very plausible to assert that unemployment in the United States in 1932 was due either to labour obstinately refusing to accept a reduction of money-wages or to its obstinately demanding a real wage beyond what the productivity of the economic machine was capable of furnishing. Wide variations are experienced in the volume of employment without any apparent change either in the minimum real demands of labour or in its productivity. Labour is not more truculent in the*

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[118] Op. cit. pp. 11.

[119] "In assuming that the wage bargain determines the real wage the classical school have split in an illicit assumption. For there may be *no* method available to labor as a whole whereby it can bring the wage-goods equivalent of the general level of money-wages into conformity with the marginal disutility of the current volume of employment. There may exist no expedient by which labour as a whole can reduce its *real* wage to a given figure by making revised *money* bargains with the entrepreneurs. This will be our contention. We shall endeavor to show that primarily it is certain other forces which determine the general level of real wages." Op. cit. pp.13

[120] "Let us assume, for the moment, that labour is prepared to work for a lower money-wage and that a reduction in the existing level of money-wages would lead, through strikes and otherwise, to a withdrawal from the labour market of labour which is now employed. Does it follow from this that the existing level of real wages accurately measures the marginal disutility of labour? Not necessarily. For, although a reduction in the existing money-wage in terms of wage-goods would lead to a withdrawal of labour, it does not follow that a fall in the value of the existing money-wage in terms of wage-goods would do so, if it were due to a rise in the price of the latter. In other words, it may be the case that within a certain range the demand of labour is for a minimum money-wage and not for a minimum real wage. The classical school have tacitly assumed that this would involve no significant change in their theory. But this is not so. For if the supply of labour is not a function of real wages as its sole variable, their argument breaks down entirely and leaves the question of what the actual employment will be quite indeterminate. They do not seem to have realized that, unless the supply of labour is a function of real wages alone, their supply curve for labour will shift bodily with every movement of prices...Now ordinary experience tells us, beyond doubt, that a situation where labour stipulates (within limits) for a money-wage rather than a real wage, so far from being a mere

depression than in the boom-far from it. Nor is its physical productivity less. These facts from experience are a prima facie ground for questioning the adequacy of the classical analysis."[121]

In addition to the previous microeconomic argument regarding the rigidity of nominal wages, which, let us note, implies that in the short term, prices differ from costs as determined by marginal productivity theory. Keynes questioned the validity of Say's Law, the systemic classical postulate. For Keynes, Say's Law coupled with the notion that prices would adjust immediately to costs as determined by classical price theory, meant that the existence of involuntary unemployment was impossible and therefore a strict adherence to this principle made it also impossible to understand the causes and possible remedies to depressions and widespread unemployment: *"Thus Say's law, that the aggregate demand price of output as a whole is equal to its aggregate supply price for all volumes of output, is equivalent to the proposition that there is no obstacle to full employment. If, however, this is not the true law relating the aggregate demand and supply functions, there is a vitally important chapter of economic theory which remains to be written and without which all discussions concerning the volume of aggregate employment are futile."*[122] The world described by the classics constituted a special case of general equilibrium: full employment equilibrium. A situation seldom present in the real world. In Keynes' words, *"...the characteristics of the special case assumed by the classical theory happen not to be those of the economic society in which we actually live, with the result that its teachings is misleading and disastrous if we attempt to apply it to the facts of experience.*"[123]

The Keynesian alternative systemic principle to Say's Law of markets, was the principle of effective demand, quoting from the General Theory: *"When*

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possibility, is the normal case. Whilst workers will usually resist a reduction of money-wages, it is not their practice to withdraw their labour whenever there is a rise in the price of wage-goods." Op. cit. pp. 8.

[121] Op. cit. Pp. 9.
[122] Op. cit. Pp. 26.
[123] Ibid.

employment increases, aggregate real income is increased. The psychology of the community is such that when aggregate real income is increased aggregate consumption is increased, but not by so much as income. Hence employers would make a loss if the whole of the increased employment were to be devoted to satisfying the increase demand for immediate consumption. Thus, to justify any given amount of employment there must be an amount of current investment sufficient to absorb the excess of total output over what the community chooses to consume when employment is at the given level. For unless there is this amount of investment, the receipts of the entrepreneurs will be less than is required to induce them to offer the given amount of employment. It follows, therefore, that, given what we shall call the community's propensity to consume, the equilibrium level of employment, i.e. the level at which there is no inducement to employers as a whole either to expand or to contract employment, will depend on the amount of current investment. The amount of current investment will depend, in turn, on what we shall call the inducement to invest; and the inducement to invest will be found to depend on the relation between the schedule of the marginal efficiency of capital and the complex of rates of interest on loans of various maturities and risks.

Thus, given the propensity to consume and the rate of new investment, there will be only one level of employment consistent with equilibrium; since any other level will lead to inequality between the aggregate supply price of output as a whole and its aggregate demand price. This level cannot be greater than full employment, i.e. the real wage cannot be less than the marginal disutility of labor. But there is no reason in general for expecting it to be equal to full employment. The effective demand associated with full employment is a special case, only realized when the propensity to consume and the inducement to invest stand in a particular relationship to one another. This particular relationship, which corresponds to the assumptions of the classical theory, is in a sense an optimum relationship. But it can only exist when, by accident or design, current investment provides an amount of demand just equal to the excess of the

aggregate supply price of the output resulting from full employment over what the community will choose to spend on consumption when it is fully employed."[124]

From the theoretical perspective Keynes concluded: *"Thus the analysis of the Propensity to Consume, and the definition of the Marginal Efficiency of Capital and the theory of the Rate of Interest are the three main gaps in our existing knowledge which it will be necessary to fill. When this has been accomplished, we shall find that the Theory of Prices falls into its proper place as a matter which is subsidiary to our general theory."* [125]

Hence, the explanation of the behavior of modern capitalist economies required to supplement the classic theory of value, for Keynes the Smithian inspired Marshallian version, with the study of the dynamics of consumption, the profitability of capital, and of the determination of the interest rate in financial markets, as determinants of the level of aggregate effective demand. The latter as different markets whose analysis could not be simply carried on in terms of classical price theory, in other words capital and money could not be treated as commodities. Keynes did not make such a statement clearly and unambiguously. However, his scientific economics intuition was on the right tract. A truly general theory of modern capitalist economies requires a different but integrated treatment of the markets for produced commodities and for financial assets. The pricing mechanisms in each case are essentially different but both markets are interrelated. Unfortunately, the fact that Keynes did not deal with the pending theoretical questions of profits, capital and interest in a systematic way, and tended to use the above mentioned variables with different definitions depending the problem he was dealing with, sometimes explicitly assuming some version of the orthodox value theory as valid, sometimes advancing different 'theories,' or even expressing his preferences for pre-classical labor theory! Is, to an important extent, the origin of so much confusion[126] about Keynes' contributions to the

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[124] Pp. 27-28.
[125] Op. cit. Pp. 32.
[126] The works of Dow, Chick, Gerrard, etc., already quoted in the first section are a good example.

theory and practice of economics. Particularly confusing are Keynes' analyses of capital, he does not break completely away with the tradition of viewing capital as a thing of different types a productivity of its own and with varying yields, and he does not think of capital as a pure claim on future returns. What Axel Leijonhufvud calls, Keynes's habit of lumping together under the heading of non-money assets every possible form of value storage, is certainly one of, if not, the major weaknesses of Keynes' aggregative structure. The problem with Keynes' conceptualization of capital is clear when in different paragraphs of the general theory he speaks about different pricing mechanisms or criteria for the valuation of capital, sometimes it is the supply price, others the market price, then the replacement cost of the thing, or its capitalized value. A few references will suffice: *"If there is an increased investment in any given type of capital during any period of time, the marginal efficiency of that type of capital will diminish as the investment in it is increased, partly because the prospective yield will fall as the supply of that type of capital is increased, and partly because, as a rule, pressure on the facilities for producing that type of capital will cause its supply price to increase; the second of these factors being usually the more important in producing equilibrium in the short run, but the longer the period in view the more does the first factor take its place."*[127] In another place he talks about physical capital and an investment, a security, as synonyms: *"When a man buys an investment or capital-asset, he purchases the rights to the series of prospective returns, which he expects to obtain from selling its output..."*[128] We can also see that Keynes, loyal to the Marshalian tradition, did not break away completely from the traditional marginal productivity theory of factor pricing, even though he often considered it only as a special case but a valid one: *"The ordinary theory of distribution, where it is assumed that capital is getting **now** its marginal productivity (in some sense or other), is only valid in a stationary state."*[129] As we saw the determination of the value of capital implies certain circularity, that

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[127] Op. cit. Pp. 136
[128] Op. cit. Pp. 135
[129] Op. Cit. pp. 139.

Keynes, for example, finds in Marshall's analysis of capital and its returns.[130] This is clear in the following quote where the value of capital is determined by discounting its future returns: *"I would, however, ask the reader to note at once that neither the knowledge of an asset's prospective yield nor the knowledge of the marginal efficiency of the asset enables us to deduce either the rate of interest value or the present value of the asset. We must ascertain the rate of interest from some other source, and only then can we value the asset by "capitalizing" its prospective yield."*[131] And in a different chapter Keynes uses another criteria to determine the value of capital, now it is scarcity: *"It is much preferable to speak of capital as having a yield over the course of its life in excess of its original cost, than as being productive. For the only reason why an asset offers a prospect of yielding during its life services having an aggregate value greater than its initial supply price is because it is* **scarce***; and it is kept scarce because of the competition of the rate of interest on money. If capital becomes less scarce, the excess yield will diminish, without its having become less productive-at least in the physical sense."*[132] It should be crystal clear by now, that we can say that capital is scarce, if only if, we are talking about capital as a physical thing, as a set of commodities, and then only in the short term because capital goods can be produced. If we are talking about capital as a claim, a property right over the future returns of a particular firm, embodied in a piece of paper, a 'share,' a security. How can we speak about scarcity? And well, when and how, do we apply replacement costs, marginal productivity theory, scarcity or any of the possible capitalized value methods and rates to price capital assets? Whatever these assets are. Of course Keynes is not alone in this respect, up to this date capital theory is plagued by confusion. Quoting Keynes again: *"There is, as I have said above, a remarkable lack of any clear account of the matter."* [133]

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[130] See Op. Cit. pp. 140.
[131] Op. Cit. pp. 137.
[132] Op. Cit. pp. 213
[133] Op. Cit. pp. 139.

A crucial but unresolved issue present in Keynes is the existence, or not, of significant 'wealth' or 'capital' effects derived from the variations in the value of securities, capital as an entitlement, that can have real effects by their impact in aggregate demand. According to Leijonhufvud, in Keynes' vision, the social function of production is eternal and the individual households are ephemeral. Ownership is divorced from the function of management of productive resources. Households in the early part of their life cycles consume less than the value of the services which they contribute. Their resulting claims on the system's resources they accumulate in the form of 'shares' in society's ongoing productive concern. In later stages of the life cycle families consume more than the value of their concurrent productive contribution. They finance their consumption through the sale of income sources, 'shares,' they are dissaving. The welfare of the owners of 'shares' depends upon the consumption value at which these assets can be resold. The higher the "real value" of these long-term assets the better off is the owner. If we consider the returns on these shares as given, a fall in the rate of interest, means that their value increases and therefore has a positive wealth effect.[134]

For Keynes, in general, wealth effects are positive and significant.[135] In standard neoclassical theorizing, wealth or capital effects, are non existing. For Hicks they are most likely neutral and of little significance, for F.H. Knight they are: "…largely a fiction and a delusion." Within the production function one-commodity models, the value of the capital stock relative to the consumption good does not vary with changes in the interest rate or the marginal efficiency of capital. Under the conditions of a given technology and given resource endowments, in standard general equilibrium, wealth effects are assumed to be

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[134] "Keynes postulated that his "windfall effect" would apply to the system as a whole. This second Pyschological Law states an assumed property of the *aggregate* consumption function. This means that individuals who experience a positive wealth effect from a fall in the rate of interest outweigh in the aggregate those who are made worse off by such an event. Is it possible to make a logically consistent case for the possibility of positive aggregative wealth effects? If such a case cannot be made, the attempt to find a rationalization of Keynes' windfall effect by the present route of inquire must be abandoned." Leijonhufvud, A. Pp. 249.

zero in the aggregate. It is usually accepted the existence of the possibility of net distribution effects, but it is considered that the impact of such net distribution effects on excess demand conditions in any particular market would be unpredictable. Hence, wealth or capital effects should be disregarded. In modern monetary theory, the usual assumption is that the redistribution of "wealth" between creditors and debtors due to movements in prices will have no predictable effects on aggregate demand, we can safely ignore the financial structure of the economy. An exception in Neoclassical monetary theory, is the real balance effect, nevertheless, the wealth effect interpretation of the real balance effect has been challenged as well. It is argued, that this interpretation rests on an arbitrarily assymetrical treatment of what is properly a distribution effect.[136] In general, it is considered that the appearance of wealth effects, implies "irrational behavior," or "asymmetric distribution effects," an "illusion" or the use of some other arbitrary assumption. Nevertheless, if we consider Keynes long term assets' as capital,[137] as defined in this study, that is as a property right on future residual profits, then we may be able determine consistently, the existence of significant wealth or capital effects at the macrolevel due to changes in the interest rate and/or the general profitability of investment, and in the financial structure of the economy. That is, we may be able determine the existence of fluctuations in the value of capital, that can generate divergences between aggregate demand and supply, that is, effects that may cause the breakdown of Says' Law. Something that Keynes indicated as a possibility but did not develop.

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[135] Keynes had a contradictory view in this matter he wrote "A country is no richer" when the general level of securities prices goes up without any change in objective transformation possibilities, "but the citizens, beyond doubt, *feel* richer." See Leijonhufvud, A. Pp. 266.

[136] "If this modern critique of the real balance effect [by H. G. Johnson] were accepted we would thus end up with no aggregative wealth effects of any kind in short-run theory." Leijonhufvud, Axel. Pp. 260.

[137] "Once we relinquish the treatment of saving as simply the purchase of bundles of differently dated amounts of "the" consumer good and admit a demand for "wealth as such," the door is open to Keynes' "Precaution, Foresight, Calculation, Improvement, Independence, Enterprise, Pride, and Avarice" and sundry other "spirits" of a more or less animal" description...This "view of what the world is like" also implies that in the management of his portfolio, the representative transactor will be vitally concerned with the risk of capital loss and that, on balance, he will try to shed "capital uncertainty" rather than (net) "income uncertainty."" Leijonhufvud, Axel. Pp. 258-259.

All in all, Keynes and some of his followers' attack on Say's Law has proven unsuccesfull, turning the 'market clearing' postulate into the central tenet of standard economics. What Keynes failed to do, was to recognize that Say's Law, as a short and as a long term equilibrium condition, only implies full employment when coupled with the second classical and Walrasian long term condition that prices equal costs. Also what Keynes failed to fully recognize is that the classical price theory—Marshallian marginal productivity based—, that he somewhat reluctantly accepted, implied automatically both long and short term equilibrium conditions and hence full employment. What Keynes' critics from the neoclassical perspective did, was to reassert classical Marshallian price theory and deny that workers suffered from 'money illusion' when they negotiate their salaries. By doing so, the first element of the Keynesian critique was gone, except when nominal wages are rigid by assumption, an obvious special case of unemployment. Then they collapsed the interest rate and the profit rate, the marginal efficiency of capital, into the interest rate only, as the price that would guarantee the equality of savings and investment, and with it Say's Law. The rejection of any type of wealth or capital effects, not sufficiently established by Keynes, eliminated the speculative motive in the demand for money and permitted to conclude that the vagaries of the financial markets and the financial structure of the economy could be safely put aside. Only in the extreme case of the liquidity trap, another special case, the economy could be 'trapped' in unemployment. Keynes' general theory became the special case. From my perspective, the problem is not wether or not Say's Law is valid. It is valid. The problem lies in a particular conceptualization of price formation and output generation in competitive market conditions. What should be rejected is the Smithian inspired classical price theory where profits are a cost.

Unfortunately, Keynes was not ready to break with the Smithian inspired Marshallian pricing paradigm, where prices are the sum of quantities of labor, capital, and land, times their prices: wages, interest and rent, as determined by their marginal productivity. And he did not have an alternative, something that is

clear throughout his work, particularly regarding the price of capital and its nature. An area in which his dissatisfaction with orthodox price theory was evident. So evident that in the chapter *"Observations on nature of capital"* he even advocated a return to a pure labor theory: *"I sympathise, therefore, with the pre-classical doctrine that everything is produced by labour, aided by what used to be called art and is now called technique, by natural resources which are free or cost a rent according to their scarcity or abundance, and by the results of past labour, embodied in assets, which also command a price according to their scarcity or abundance. It is preferable to regard labour, including, of course, the personal services of the entrepreneur and his assistants, as the sole factor of production, operating in a given environment of technique, natural resources, capital equipment and effective demand."*[138]

Notwithstanding, the general direction of Keynes' theoretical research was, in my opinion, correct: the ideal long-term of the classics did not correspond to the realities[139] of our world; we need a theory to explain the actual short term aggregate movements of real life economies, that seldom, if ever, are in the ideal end-type situation portrayed by Smith or in the Walrasian world. Keynes derided Ricardo's domination of English economics for more than a century, nevertheless he developed solutions for some of the original problems that Ricardo assumed: the short term determination of total demand and output, the determination of real wages, and in the spirit of the classics he did so from the perspective of the profitability of capital, as different from the interest rate. Which is what that obscure member of the underworld, Marx, did as well. From the perspective of the theoretical system of classical political economy, the Keynesian proposal seems more classic than the classical theory Keynes was struggling against. However, the consideration of the role of financial markets in the short term dynamics of effective demand constitutes a rupture with the tradition of considering economic phenomena mainly in real terms.

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[138] Op. cit Pp.213-214.

5.2. The Neoclassical IS-LM synthesis and the New Classical Macroeconomics.

It is now a commonplace observation that what Keynes did, was to provide for the first time in the history of economics an integrated analysis of commodities and financial markets. This he did by developing a theory of total output determination that relied on a great extent on the interaction of the marginal efficiency of capital, as a measure of profitability determined in more or less "real" terms and by the state of expectations—the market valuation of investments and/or the so called 'animal spirits' of entrepreneurs—and the interest rate, as determined in financial markets where the so called speculation motive played a very important role in the demand for money. The rates of profit and interest together would determine the level of investment, hence the level of effective demand, which could also be affected by 'wealth effects,' and at last, given his consumption theory, the level of output, employment and real wages would be determined.

Contemporaneous teachings of macroeconomics present an integrated analysis of real and financial markets in the "Neoclassical Synthesis" or the IS-LM, framework. John Hicks, in his seminal essay: "Mr. Keynes and the Classics"[140] developed for the first time the basis of the IS-LM analysis. Alvin Hansen in the USA subsequently expanded this analysis. IS stands for the equality between savings and investment, which is considered the equilibrium condition of commodities markets, and which implies Walras' Law. LM stands for the equality of the demand and supply of money as the equilibrium condition for the financial markets. L, stands for the liquidity preference or demand for money, and M, for the money supply. There are numerous scholars that have criticized this integration and that disagree that the IS-LM framework integrates and

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[139] "The celebrated *optimism* of traditional economic theory, which has led to economists being looked upon as Candides, who, having left this world for the cultivation of their gardens, teach that all is for the best in the best of all possible worlds provided we will let well alone..." Op. cit. P.33.

correctly represents the original Keynesian thought. Among others and as an example: J. Robinson, P. Davidson, R. W. Clower and A. Leijonhufvud. Nevertheless, nowadays the Hicks-Hansen IS-LM model is still at the core of standard macroeconomics teachings, and it is considered a model of Keynesian inspiration. Monetarists[141] and the New Classical[142] economists have severely criticized the IS-LM model as a valid tool of analysis, and have rescued the views of what Keynes saw as the 'classical theory,' that is total output is determined exclusively in real terms, monetary and financial forces do not matter and the economy is more or less always in or near full employment.

Needless to say, Keynes' analysis and contemporaneous derivations, hinges around the question of the role of monetary and financial forces, vis á vis, real forces.[143] Within the classical theoretical system, the analysis was carried on strictly real terms, the quantity theory of money was introduced as a mere measuring device, nevertheless for the classicals the consideration of the profitability of capital was essential. In Walrasian general equilibrium analysis the analytical stance is the same, money is simply a numéraire, a veil over real phenomena. However, Walras introduced the problem of the valuation of capital contingent on future returns. A more contemporary 'real' view is that of Friedman's monetary analysis: "We have accepted the quantity theory presumption... that changes in the quantity of money *in the long run* have a negligible effect on real income so that non-monetary forces are 'all that matter'

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[140] Hicks L.R. "Mr. Keynes and the 'Classics': A Suggested Interpretation," Econometrica, April 1937. In his "Keynesian Economics and the Economics of Keynes" Axel Leijonhufvud recalls Hicks warning about the uncritical use of his "skeleton apparatus" : "...it remains a terribly rough and ready sort of affair..."

[141] Milton Friedman, Allan Meltzer and Karl Brunner, among others.

[142] The best known are Robert E. Lucas Jr., Thomas J. Sargent, Robert M. Towsend, Robert Barro and within the Real Business Cycle school Edward Prescott and Finn Kydland, among others.

[143] Schumpeter distinguishes between two major analytical traditions in economics: Real Analysis and Monetary Analysis. In his words: "Real Analysis proceeds from the principle that all the essential phenomena of economic life are capable of being described in terms of goods and services, of decisions about them, and of relations between them. Money enters the picture only in the modest role of a technical device that has been adopted in order to facilitate transactions...So long as it functions normally, it does not affect the economic process, which behaves in the same way as it would in a barter economy: this is essentially what the concept of Neutral Money implies." [...] "Monetary Analysis introduces the element of money on the very ground floor of our analytic structure and abandons the idea that all essential features of our economic life can be represented by a barter-economy model." (Schumpeter, J. A. 1954. History of Economic Analysis. New York: Oxford University Press. pp. 277-78).

for changes in real income over decades and *money 'does not matter'.* "[144]
Following on Friedman's steps, the New Classical Economists adopt a quite
radical money does not matter view: the neutrality of money proposition(s).[145]
They would accept, however, that money somewhat matters in the short term
and try to model particular circumstances where monetary or financial instabilities
can arise, due to imperfect information and uncertainty. What is common to
contemporary 'real analysts' is the general presumption that money does not
matter very much and the treatment of money and securities as if they were
goods, cash goods, credit goods, etc., etc., that are part of the agent's utility
functions and are "consummed" as apples or oranges.[146] Within this view the
demand for money, that is the demand for cash goods, is not explained, it is
assumed.[147] For the New Classical economists, the most important aspects of
the economic world can be analyzed without references to monetary or financial
forces, except when they are considered as exogeneous shocks.

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[144] Friedman and Schwartz: income and prices will typically be found 'dancing to the tune called by independently originating monetary changes'. Conclusion of Friedman and Schwartz:, "Monetary History of the United States" P. 686. Neo-walrasians typically argue that in a closed economy, the absolute levels of money prices and aggregate money income depend *ultimately* on the quantity of legal tender means of payment as determined by the fiscal and monetary operations of government; but that the impact effects of autonomous changes in the stock of legal-tender money cannot be disentangled from other and equally important sources of economic disturbance--technological, phsychological, etc.--not, at least, by visual inspection of historical time-series data and casual study of related events. More pointedly, legal tender money--which does not include either demand or time deposits-- is merely one of many generally acceptable means of payment. The great bulk of objects which people regard as "money" at any given point in time consists of debt instruments, the amounts of which are determined in the short run not by government authorities but by the general public....it is absurd to assign a prominent role in cyclical movements to variations in the stock of legal-tender money, and it is even more absurd to treat the total "stock of money," however one might define it as an independent variable. See Robert Clower, Pp. 69-70. As the great neo-Walrasian Frank Hahn, more or less, said: If money does not matter neither does inflation, it is a truly astonishing feat to 'embrace a theory were inflation has negligible costs, and yet be the most vociferous advocates about curing inflation at any price.'

[145] "I should think we would view any monetary model that did *not* have this neutrality property with the deepest suspicions, the way we would view a physical model that predicted different times for the earth to complete its orbit depending on wether distance is measured in miles or kilometers." Robert E. Lucas Jr. "Models of Business Cycles" p. 74.

[146] A crucial aspect of the common practice of conceiving money and securities as goods no different than 'apples an oranges' and dealing with them in terms of individual agents maximizing the utility they derive from the amounts of cash goods and credit goods they consume, is that it must be assumed that there is decreasing marginal utility of having more money, otherwise the required equimarginal conditions do not obtain in equilibrium. In a world of profit maximizing firms where money is power, this is clearly contradictory.

[147] For example: "Here, to motivate the use of money, a subset of consumption goods—'cash goods'—will be thought of as exchanged in circumstances where the buyer is unknown to the seller, so that the latter is unwilling either to accept as payment claims issued in earlier securities trading or to issue trade credit to be discharged later. Such goods, if purchased at all, *must* be paid for with currency acquired in advance..." p. 74. [...] "...it is central to monetary theory that there are intertemporal movements in purchasing power that cannot be effected with securities: otherwise, we wouldn't need the money!" p. 78. Robert E. Lucas Jr. "Models of Business Cycles"

The neo-classical synthesis in the form of the IS-LM model summarizes what is considered by some writers the first modern integrated analysis of commodities and financial markets. The IS-LM model, a skeleton according to Hicks, consists in a static simultaneous equation model that is supposed to capture the essential features of the short run behavior of a modern economy. The fact that since the forties of the XXth Century this model, obviously in successively refined versions, has been used in macroeconomics as a basic tool of macro-analysis is ample testimony of its simplicity, elegance and predictive power. This model has been taught for decades as basic macroeconomics almost in every school. Nevertheless, due to the New Classical critique of the 'Keynesians,' the moderate perspective of the IS-LM model has been substituted in many graduate schools of economics that have embraced neoclassical growth theory as the centerpiece of their macroeconomic teachings. I am mainly interested to see if and how, the classical and classic Keynesian perspectives, regarding profits, capital, the profitability of capital, etc., etc. are considered in the basic analytical tools of the most important contemporary approaches to macroeconomics. For the purposes of this essay a brief description of the most essential aspects of these currents will suffice, by necessity, it is a general and preliminary exercise.

The commodities market, IS, is assumed to be in a market clearing situation, that is aggregate supply equals aggregate demand. This equilibrium condition is expressed in the familiar: Investment-Savings equality. The interest rate will vary until these two variables equalize. The higher the interest rate the higher the level of savings. The higher the level of the interest rate the lower the level of investment. The higher the level of investment, the higher the level of aggregate demand and hence of income and production. And for every level of aggregate income/output, there is a level of the interest rate that will achieve the Investment-Savings equality. The so-called IS curve represents the graphical locus of all the possible pairings of aggregate income and the interest rate that

satisfy the IS equilibrium condition. The IS curve has a negative slope reflecting the fact that the level of production will be higher the lower the interest rate, and hence the higher the level of investment. The financial market, LM, is conceived as a market for money where the demand and the supply for money determine the interest rate for a given level of aggregate income. From an individual agent's perspective the choice is between holding money or interest bearing bonds. The supply of money is determined by the Central Bank through open market operations, that is through selling and buying bonds in the open market. When the Central Bank sells bonds, reduces money in circulation, fixed-interest bond prices will go down, and the interest rate will increase. The process is reversed when the Central Bank buys bonds. The demand for money depends directly on the level of income, in other words, the higher the level of production the higher the amount of money agents will want to hold to sustain their desired level of transactions. That is to say, people want to hold a certain level of real[148] money balances for a given level of real income or output. Clearly holding cash is not costless, so the demand for money will be affected by the interest rate, the higher the interest rate the lower the demand for idle cash balances, either for transactions or precautionary motives. Keynes' speculative motive[149] is absent in this version of the demand for money. Given the money supply an increase in the level of aggregate income will mean an increase in the rate of interest. The demand for money will increase because for a higher level of real output, the desired volume of real balances will consequently grow, if the money supply does not augment accordingly the interest rate will rise. So for every level of income there is an interest rate that will equalize the demand and supply for money, L-M. Thus the higher the level of income, the higher the interest rate that

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[148] Real means adjusted by the price level. The amount of money balances that agents will hold will be determined by the real acquisitive power of money. Variations in nominal prices will affect the real value of money balances and hence aggregate demand. This effect is known contemporarily as the Real Balance Effect, or Patinkin effect, but it was introduced originally by Pigou in relation to Keynes' unemployment equilibrium. The Real Balance effect is supposed to provide the stimulus for the return to full employment.
[149] "The three divisions of liquidity-preference which we have distinguished above may be defined as depending on (i) the transactions-motive, *i.e.* the need of cash for the current transaction of personal and business exchanges; (ii) the precautionary-motive, *i.e.* the desire for security as to the future cash equivalent of a certain proportion of total resources; and (iii) the speculative-motive, *i.e.* the object of securing profit from knowing better than the market what the future will bring forth." Keynes, J. M. "The General Theory..." P. 170.

will satisfy the equilibrium condition in the "financial" market, given the money supply. The LM curve represents the graphical locus of all the possible pairings of aggregate income and the interest rate that satisfy the equilibrium condition of the financial market, the demand for money equals the money supply. The LM curve has a positive slope.

If these two curves, IS-LM, are superimposed they will intersect at the point where there is a simultaneous equilibrium of the commodities and the financial market. There is only one possible combination of the interest rate and the level of income that will guarantee the simultaneous equilibrium in both markets. In a world where Walras' Law holds instantaneously and where labor markets are perfectly flexible and there is no money illusion, that is agents make their decisions based on real factors only, the only simultaneous equilibrium possible is full employment equilibrium. In this world Keynes' "unemployment equilibrium" is a logical impossibility, unemployment is a temporary disequilibrium phenomenom. If for example, real wages are higher than their full employment level, nominal wages will fall due to the excess labor supply. As a result monetary costs and prices will fall too, and the real value of cash balances will rise. The LM curve will shift to the right because active money balances would be released, the interest rate will fall and investment will be stimulated and the aggregate demand will expand until the output corresponding to the level of full employment is absorbed. The aggregate level of income is established at the full employment level in the labor market, variations in the interest rate will equate savings and investment at this level, and the price level will adjust to satisfy the demand for real money balances at this interest rate. For Keynes' the essential feature of a modern capitalist economy is that there is not an automatic mechanism that will propel the economy to a situation of full employment. Keynes' aggregate equilibrium condition can be stated as aggregate supply equals effective demand, and that this equality will hold at a continuum of employment levels. The existence of 'unemployment equilibrium' is the general case, 'full employment' equilibrium is a special case. In the framework of the

neoclassical synthesis the situation is reversed. Keynes' 'unemployment equilibrium' is the a special case, obtainable according to standard teachings once some sort of information problem, inelasticity of some variables, and/or rigidities in prices are introduced in the pure free markets mechanism. The liquidity trap, the interest-inelasticty of investment and rigid wages are the commonly cited "Keynesian" cases that can lead to equilibrium with unemployment.

At a first glance the neoclassical synthesis seems to fill some of the crucial gaps within the classical theoretical system as defined. It provides a short term theory of the determination of total income and output, through the interaction of the commodities and the financial markets, á la Keynes. It also incorporates an explicit link with monetary forces, through the real balances theory and the Patinkin effect, which presents a rational for the demand of money absent in the the version of the quantitative theory of money of the classical system. The demand for money is 'explained' and the same theory provides the mechanism that will propel the economy out of a situation of equilibrium different from full employment. In this way monetary forces interact with real forces and a more realistic picture of how the economy works is supposed to be presented. Nevertheless the IS-LM approach eliminates the problem of profits and the profitability of capital, it equates the savings of households with the profits of firms, adding them together under the heading of savings, and makes them, together, a positive function of the interest rate. Households, of course, can decide how much of their income they are going to consume and how much they are going to invest, and it can be accepted that 'the interest rate' plays a decisive role. Firms, at least in the real world, cannot decide how much money they are going make, how much profits they are going to generate, and in a world of leveraged firms a higher interest rate means less profits, as every manager knows. The fact that in national accounting profits from firms, savings from households, governmental and external trade surlpuses, are lumped together as 'savings' is just an accounting convention and does not make essentially different

economic concepts like, familiy savings and profits from firms, one and the same thing. In the original Keynesian thought, profits would determine investment, investment, income and given the propensity to consume, savings would be determined, being by definition equal to investment. For Keynes, the interest rate established a lower limit to investment, only project with returns over and above 'the' interest rate, would be undertaken. Going back to the Smithian ways, the IS-LM perspective, subsumes the rate of profits to the interest rate on funds, when it was Keynes' intention to clearly separate the Marginal Efficiency of Capital from the Interest Rate, and to study the way changes in the valuation of capital, including debt and equity, could affect financial markets through the liquidity preference of investors; and, financial and commodity markets, through capital effects that could induce variations in effective demand. Even though, Keynes was ambivalent about wealth or capital effects, he believed that financial markets could generate significant systemic disturbances that could keep economies away from full employment for significant periods of time, at considerable costs in terms of welfare loses for the population. For Keynes the main economic problem was to generate enough investment, to keep the economy near or at full employment levels, and for him the organization and functioning of financial markets was crucial to this end, clearly he taught that investment markets were not playing the fundamental role they should and that the existence of highly organized markets could even prove to be destabilizing.[150]

In standard macroeconomics teachings, with the IS-LM model as the core of their analysis, financial markets are limited to the neoclassic LM, perspective of money and one financial asset, a fixed interest government bond, and one price, the interest rate, and when they analyze the other financial markets, i.e.

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[150] "Speculators may do no harm as bubbles on a steady stream of enteprise. But the position is serious when enterprise becomes the bubble on a whirpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done." Keynes, J. M. "The General Theory..." P. 159. Of course, Keynes was not *against* financial markets per se, he was *for* the proper organization of financial markets and he saw a public policy dilemma in this: "As when we were discussing the marginal efficiency of capital, the question of having a highly organised market for dealing with debts presents us with a dilemma. For, in the absence of an organised market, liquidity-preference due to the precautionary-motive would be greatly increased; whereas the existence of an organised market gives an opportunity for wide fluctuations in liquidity-preference due to the speculative-motive." P. 171.

private debt and equity, as if they were independent, they do it as "extensions" of the core model, without integrating them to it.[151] Capital markets are treated as separate independent markets for debt and equity, securities are priced based on a Smithian paradigm where their cost is determined by the sum of a basic, non-explained, rate plus a risk premium, in essence securities are treated as goods and the price of capital as a cost. In this vision capital markets have an insignificant, if any, impact on the short and in the long term functioning of the economy. The Hicksian and Knightian belief, that capital effects are an 'insignificant illusion' is assumed. Even when the complete universe of securities is analyzed, as is the case with modern portfolio theory, the problem is stated considering as given the value of wealth to be allocated. It is recognized, however, through James Tobin's theory of investment, the q ratio[152] theory, that capital markets do have a short term impact on the level of investment, but this analysis is not logically integrated in the IS-LM macroeconomic framework. The integration of the classical quantity theory of money through the real balances effect is far from satisfactory, as is well known in the general equilibrium literature regarding the foundations of monetary theory, in the last analysis the positivity of the price of money and hence the demand for money cannot be explained by the real balances theory. For these writers it depends on exogenous structures. [153] Exogenous, that is, to the general equilibrium system that determines the prices of commodities, of particular importance is the introduction of the state and the demand for money derived from taxes payable in money. In other words, value theory alone cannot explain the existence of a positive demand for money. Value theory as such can explain the relative prices of commodities but monetary and financial phenomena, though obviously linked to 'real' phenomena, require

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[151] See for example: Blanchard Olivier, "Macroeconomics" Second Edition Prentice Hall, 2000.
[152] Tobin's q, is a ration between the total market value of debt and equity of a firm, and the value of the firm's assets at replacement cost. If the market value of the claims against the firm's value is higher than the costs of replacing them, (q>1), then the firm should invest more, issuing additional equity and/or debt. Empirically it has been shown that there is a close direct relationship between q and investment with a one year lag. In my opinion, the fact that in reality, for example, practically always in the postwar USA, the aggregate q ratio is different than one, is enough evidence that capital effects exist and are very significant.
[153] See Starr (1989).

different theories to be explained.[154] Modern financial economics can prove to be extremely valuable in this respect. In short, the essential difference between capital and commodities markets and the crucial role Keynes and the old classics adscribed to the profitability of capital in the dynamics of capitalism is lost, and the significance that Keynes adscribed to monetary and financial markets dynamics is severely diluted in the IS-LM framework.

Until the 1970s there was something of a centrist consensus regarding macroeconomics, built around the neoclassical synthesis. Of course, the synthesis and related themes were intensely debated from the post-Keynesian, Marxist and Monetarist camps. The post-Keynesians rejected the neoclassical synthesis on the grounds that the underlying general equilibrium mechanism implied the validity of Say's Law, Walras' Law, which was precisely what Keynes was fighting against, they also stressed that the synthesis ignored Keynes' notion of fundamental uncertainty and concentrated in the effective demand. As we saw in the famous capital controversies, they also completely rejected the classical Marshallian price theory—implicitly integrated in the IS-LM framework—and tried to develop alternative microfoundations for Keynes aggregate analysis. Clower and Leijonhufvud, further developed Keynes into a disequilibrium analysis that stressed information and coordination problems. The Marxist camp, rejected outright the 'reformist' conclusions of the synthesis and the claim that capitalism could ultimately be managed by an adequate mix of economic policies, for these scholars the essential instability of capitalism resided in the divisions of social classes and power. Monetarists, headed by Milton Friedman, basically contended that the 'classical' conclusions, in Keynes' sense, were reaffirmed if the medium and long term effects of economic policies were considered, something that Keynes had disregarded, except keeping monetary growth in check there was nothing more the government should do. Nevertheless, the centrist moderate conclusions of the IS-LM 'Keynesians' held their ground as a

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[154] This is the kind of statement that infuriates New Classical economists and monetarists, that believe that every aspect of economics should be explained in terms of value theory, or of a particular version of it. I will come back to this.

practical guide for economic policy. The rational expectations hypothesis introduced by the New Classicals radically changed these conclusions.

Robert E. Lucas, Jr., contended that the predictions of the neoclassical synthesis, 'Keynesian economics,' were abolutely incorrect and that the doctrine that supported them failed. The behavior of people is strongly affected by their expectations about future events and they form these expectations in a rational way, in the most rational way, given the information they have available.[155] The implications of this critique are well known: First regarding the use of econometric models, the Lucas critique showed that the existing models at the time used to simulate changes in economic policy were flawed. The structure of the models reflected the historical relationships between economic variables, including economic policy variables. If the goal was to estimate effects of changes in economic policies, the consideration of rational expectations would necessarily introduce changes in peoples response to policies, so the old models were not an appropriate tool to estimate these changes. Second, the introduction of rational expectations in Keynesian type models, resulted in fluctuations away from the 'natural' level of output that were significantly shorter and pronounced, that the original Keynesian predictions. The aggregate supply function was revised, through the introduction of the labor market and the analysis of aggregate supply and demand as determinants of macro equilibrium in real terms. Traditional Keynesian models relied on a slow adjustment of prices and wages reflected in the Phillips Curve, that considered that there was a stable tradeoff between unemployment and inflation. The New Classicals contended that under rational expectations, there was no reason why the adjustment of wages and prices should be slow, only unexpected variations in the price level

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[155] See among others: Lucas, Robert E. Jr., 1972a. "Econometric testing of the Natural Rate Hypothesis." Pp. 50-59. *The econometrics of Price Determination,* ed. Otto Eckstein. Washington DC Board of Governors of the Federal Reserve System. 1972b. "Expectations and the Neutrality of Money." *Journal of Economic Theory 4* (April). Pp. 103-124. 1975. "An Equilibrium Model of the Business Cycle." *JPE* 83 (December) 1113-44. 1976. "Economic Policy Evaluation: A Critique." Pages 19-46 in "The Phillips Curve and Labour Markets." Supplement to *JME* 1 (April) Ed. Karl Brunner and Allan Meltzer. With Thomas J. Sargent. 1978 "After Keynesian Macro Economics." In *After the Phillips Curve: Persistence of High Inflation and High Unemployment.* Boston: Federal Reserve Bank of Boston. With Leonard A. Rapping, Lucas

would have real effects in production. As soon as the government would try to exploit the tradeoff between inflation and unemployment it would dissapear. Finally, these scholars argued that the proper instrument to deal with these problems was game theory, and that every economic model should be based on strictly rational individual behavior. In short, the IS-LM synthesis ignored two central elements: expectations did not play a role; and the processes of adjustment of wages and prices. The first inextricably linked with the rationality postulate; the second, central to the market clearing, Walras' Law, postulate. These two aspects are at the heart of the New Classical economists critique of Keynesian macroeconomics. If expectations are introduced and the rationality of individual behavior is upheld, and if Walras' Law holds for commodities markets and for financial markets, as if they were commodities, then the Keynesian synthesis models could not be used to formulate economic policy, they could not explain fluctuations in aggregate economic activity and monetary/financial forces would not matter. With their strict adherence to the rationality of expectations and market clearing postulates, the New Classical economists concluded that economic policy formulation necessarily involved strategic considerations. That is the explicit consideration of the formation of expectations in a game theoretic setting; with the corollary that policies intended to stabilize could be de-stabilizing and that fixed rule policies were better than discretionary ones. They concluded that employment and production, usually hovered at its 'natural' level determined strictly in real terms, the same conclusion of Keynes' classicals, and of the old school monetarists. Not a necessary conclusion of the theoretical system of the classics as defined in this essay, where the issue of the short term determination of output and employment and its fluctuations was an open question inextricably linked to the profitability of capital. A crucial question that Keynes tried to develop and for him essential to understand and to explain the fluctuations in employment and output characteristic of capitalism.

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published the two original papers: 1969. "Real Wages, Employment and Inflation." *JPE* 77 (September): 721-54. and 1970. "Price Expectations and the Phillips Curve." *AER* 59 (June) 342-50.

In the New Classical perspective, fluctuations in employment and output, except exogeneous shocks, major accidents or policy mistakes, would be variations of the natural level *not deviations* from it. So if there are fluctuations is because the economy is moving from one situation of competitive equilibrium to another, and these fluctuations can only be explained in terms of autonomous changes in general equilibrium conditions, preferences, technology, endowments, etc. This is the view of Edward Prescott, Finn Kydland and other economists, known as the Real Business Cycles, RBC, theorists. For the RBC theorist the main force behind variations in the actual, which is always equal to the natural, level of production and employment is technology. [156] Technological innovation increases productivity, output as a result increases too. The increase in productivity augments real wages, which makes work more attractive and induces workers to work more, output expands, etc., etc. Their analyses are based on highly simplified competitive models with a single good produced by labor and capital with a constant returns technology, and where the only shocks to the system are exogenous stochastic shifts in the production technology. The logical consequence of this view is that the classical difference between the short term and the long term is eliminated, there is no need for a Keynesian type short term theory of the determination of wealth levels different from full employment and monetary and financial forces are irrelevant. Also within this perspective the Walrasian market clearing condition is equated to the prices equal costs condition, so more implicitly than explicitly, the marginal productivity theory of profits or a Smithian type—the interest rate determines the profit rate—loanable funds theory is introduced in the analysis through the back door. With the result that the economy is in the Smithian end state, because we assume, implicitly, it is. The moderate IS-LM type conclusions are completely rejected and the more radical original approach of the General theory as well as the fundamental

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[156] Prescott and Kydland use a highly simplified model with a single good produced by capital and labour, with a constant return technology, consumer are identical and live forever, the only shocks to the system are exogenous, stochastic shifts in the production technology. The question is: "Can specific parametric descriptions of technology and preferences be found such that the movements induced in output, consumption, employment and other series in such a model by these exogenous shocks resemble the times series behavior of the observed counterparts to these series in the postwar, US economy?" In Lucas, Robert E. "Models of Business Cycles." Pp. 34.

conclusions from the capital controversies are not even considered. The crucial shortcomings, accepted by friends and foes, of neoclassical production function analyses are simply forgotten[157], and this approach is equated to general equilibrium analysis. For the New Classicals, economics is reduced to the endless development of the neoclassical aggregate production function approach to growth theory, but *with* microfoundations.

Growth theory has traditionally been studied as part of macroeconomics, focusing on the undisturbed evolution of potential output, or of the level of production at normal capacity utilization. The fundamental **assumption** is that the goods and labor markets clear, that is, labor and capital are always fully or normally employed or that the employment level does not vary, by now it should be clear that the prices equal costs condition is implicitly assumed as well. The idea of an "undisturbed" state of the economy corresponds to the Smithian ideal

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[157] An impeccable critique is that of Pasinetti: "The growth models with endogenous technical progress that have emerged are extraordinarily refined in terms of the analytical tools used and at the same time naively simplistic in their vision of the world. Basically, using few but fascinating elegant analytical tools, they offer a re-edition and a restrictive re-adaptation of a mathematical model of inter-temporal maximisation which Frank Ramsey, a young mathematician in Keynes's Cambridge group, had proposed in 1928. His model was in fact conceived as an exercise in bringing out the analytical properties of a hypothetical economic system where an omniscient central planner, endowed with eternal life, decides on the distribution of production and consumption over time for all his subjects, being himself acquainted with all their preferences and all the constraints imposed by the technical conditions. But the authors of the growth model with endogenous technical progress have had greater ambitions, aiming at providing a descriptive scheme of the real world, and it is here that they have shown surprising naivety. None have had any hesitation in using neoclassical aggregate, continuous and differentiable production functions of the very type for which abandonment had been advocated twenty years earlier. None felt the need to justify or explain the use of notions like aggregate physical capital, which, moreover, they would most of the time include in Cobb-Douglas type production functions, resting on decidedly shaky empirical support. These are applied as if they were part and parcel of everyday economic reality, not the slightest doubt being shown about them." [...] (the savings rate and the capital/net income rate) "...are "modelled" in such a way as to emerge from a process intended to represent maximising behaviour. In accordance with an approach that has found recent favour and diffusion, they are presented as having "microfoundations". It is from this feature that the growth models with endogenous technical progress acquire their elegance and at the same time reveal their naivety. Basically, they reduce their aim at analysing the behaviour of a single individual considered as "representative"; no longer a planner for all the other individuals but for herself. This extraordinary and queer individual lives forever, has perfect knowledge of the technical production functions, actually of the production function for one single good, and knows how to improve it (in other words how to produce technical know-how). She knows her utility function, from now to infinity; she adopts a (given) rate of inter-temporal preference and knows perfectly how to allocate efforts and consumption over time, in such a way as to achieve maximisation of the present value of her satisfaction, again from now to infinity, given the characteristics of production, learning, and consumer preferences, from now to eternity. It is hard to think how such singular individual could possibly be attributed the characteristic of "representativeness". Whether she is "representative" or not is precisely the question that one would wish to see demonstrated." Pasinetti, Luigi. "Critique of..." Pp. 46-47-48.

long-term end state of pure free markets. Arguing for simplicity[158] and for easier empirical testing, neoclassical growth theory uses mostly completely aggregated one-sector models, usually a single good is produced by capital and labour and all consumers are assumed to be infinitely-lived and identical, which is exactly the same as positing a single agent. Of course, models with several sectors, for example, agriculture and industry; consumption goods and capital goods; consumption goods, cash goods and credit goods; etc., etc., have been developed, but they do not change the essentials of the aggregated one sector model with one agent. The one agent idea, refers to what Solow calls the 'ultra-strong neoclassical assumption' that the economy traces out the intertemporal utility-maximizing program for a single immortal representative consumer or of a number of identical such consumers. Additionally, and so the equimarginal rule can be applied, neoclassical growth theory requires the assumption of diminishing returns to capital and labor.[159] The assumption of constant returns to scale is typically used, but it is not always needed. Marginal utility, of course, is always diminishing even in those cases where "cash" goods and other securities are 'consummed'. So we have now the old idea of the economy as a giant farm, but now managed by a single immortal representative farmer, this individual is an utility maximizer, so the theory is supposed to be solidly grounded on individual maximizing behavior. The theory now is said to have microfoundations and given that the economy is considered to be the sum of the individuals, it is perfectly fine, or better said, it is the correct way, for some the only way, to study economic problems with the model of a single aggregated good and a single utility maximizing individual and the use of dynamic games theory. These models

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[158] "As in most of macroeconomics, modeling strategy in growth theory tends to be weighted away from generality and toward simplicity, because the usual intention is to compare model with data at an early stage. Simplicity does not mean rigidity...the neoclassical growth model is extraordinarily versatile. Like one of those handy rotary power tools that can do any of a dozen jobs if only the right attachment is snapped on, the simple neoclassical model can be extended to encompass increasing and decreasing returns to scale, natural resources, human capital, endogenous population growth and endogenous technological change all without major alteration in the character of the model." Handbook of Macroeconomics /Volume 1a, Chapter 9/ Neoclassical Growth Theory. Robert M. Solow </hes/homepage/cvs/solow.htm>/Massachusetts Institute of Technology, Department of Economics.
[159] "Here "capital" means (the services of) the stock of accumulated real output in the strictest one-good case, or the complex of stocks of all accumulatable factors of production, including human capital and produced knowledge, when they are explicitly present." Op. cit. Robert M. Solow

are supposed to be general equilibrium[160] competitive models, however they are simple aggregate production function models, plus the representative consumer, where "general equilibrium" defined as market clearing with full employment of labour and capital, is an initial assumption not a result from the analysis, that is 'general equilibrium' is not a result of the game itself. Lets recall that the definition of equilibrium in the context of dynamic games theory, according to Lucas: "I have described the actions a_i simultaneously chosen by agents as a (Nash) *equilibrium*, but the term equilibrium in this (now entirely standard) context obviously does not refer to a system 'at rest', nor does it necessarily mean 'competitive' equilibrium in the sense of price taking agents, nor does it have in general any connection with social optimality properties of any kind. All it *does* mean is that, in the model, the objectives of each agent and the situation he faces are made explicit, that each agent is doing the best he can in light of the actions taken by others, and that these actions taken together are technologically feasible."[161] So general equilibrium, in the sense of Walras and A&D with all the good things that it entails, is assumed in this type of models by the introduction of the old neoclassical idea that both classical equilibrium conditions, markets clear and prices equal to costs, hold simultaneously. The short term is equated to the long term by definition.

The explicit and the implicit equilibrium conceptualization of the New Classicals, view is clearly at odds with the Walrasian treatment of the conditions and consequences of economic progress in Part VII of the *Elements*. A treatment that has been ignored by the critics that caricaturize Walras as being obsessed with the timeless determination of prices and of resource allocation, and also

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[160] As we saw in section 4. according to Koopmans, general equilibrium deals with the problem of the consistency of the actions of many independent agents. In Koopmans words: "The problem is no longer conceived as that of proving that a certain set of equations has a solution. It has been reformulated as one of proving that a number of maximization of individual goals under independent restraints can be simultaneously carried out." The usual procedure is summarized as: "...we first specify the consumption set for each consumer, the production set for each producer, the behavioral rule for each economic agent, and a competitive equilibrium. Then, using the assumptions on the consumption set and the production set, and so forth, we want to prove the existence of an equilibrium. The problem is no longer one of finding a solution for the simultaneous equations or inequalities. The stress now lies in the compatibility of each economic agent's behavior." One must ask if this is the central problem of general equilibrium analysis, how can we consider models with a single agent or identical multiple agents, which is the same, as general equilibrium models?

forgotten by some that present themselves as general equilibrium analysts. In Part VII Walras tries to introduce dynamics to his static analysis and abandons the stationary state assumptions, focusing on the systematic implications of economic progress, capital formation, changes in relative prices, among other data. Here is where Walras visualizes equilibrium as the continuous process of chasing a moving target without ever reaching it. The static analysis of a pure free market economy is clearly just an initial phase in the understanding of the long term dynamics of a capitalist economy, the goal of Walras's initial analysis is to determine the relative prices of commodities, as a step towards a 'Theory of Social Wealth.' As we saw, the equilibrium conception of Walras involves more than the 'supplies equal demands' condition. He shares Marshall's interest in the long-period equilibrium where prices are ultimately determined by costs of production including a 'normal equal return on capital.' These long-period prices refer to relative prices that would obtain in 'normal conditions' in a free market economy, a question that requires the consistent theoretical elucidation of the problems of profits, capital and the rate of profits, as well as the interest rate. The latter fundamental questions to understand the dynamic issues of the long term development of capitalist economies from the perspective of the classical political economists. Neither the classicals, Walras or Marshall succeeded in tackling with these problems. Keynes presented an alternative, incomplete and problematic, but in the right direction. Walras as is known devoted most of his work to the development of the analysis' initial phase, merely outlining the vision of a dynamic analysis. However, he was clearly aware of the need to go beyond as we can see in Lesson 35 of the *Elements*:

"Finally, in order to come still more closely to reality, we must drop the hypothesis of an annual, market period and adopt in its place the hypothesis of a continuous market. Thus, we pass from the static to the dynamic state. For this purpose, we shall now suppose that the annual production and consumption, which we had hitherto represented as a constant magnitude for every moment of

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[161] Lucas, Robert E. "Moderls of Business cycles" pp. 15-16

the year under consideration, change from instant to instant along with the basic data of the problem." [...]*"Such is the continuous market, which is perpetually tending towards equilibrium without ever actually attaining it, because the market has no other way of approaching equilibrium except by groping, and, before the goal is reached, it has to renew its efforts and start over again, all the basic data of the problem, e. g. the initial quantities possessed, the utilities of goods and services, the technical coefficients, the excess of income over consumption, the working capital requirements, etc., having changed in the meantime. Viewed in this way, the market is like a lake agitated by the wind, where the water is incessantly seeking its level without ever reaching it. But whereas there are days when the surface of a lake is almost smooth, there never is a day when the effective demand for products and services equals their effective supply and when the selling price of products equals the costs of the productive services used in making them."*[162]

For Walras different adjustment processes operate at different speeds: in a single market, or in Marshalian terms in partial equilibrium, current prices pertaining to the market day are, can be, market clearing and can be determined in a matter of minutes. In contrast, the achievement of "full" equilibrium, where prices are equal to costs of production, is a considerably longer and slower adjustment process and in this process the evolution of profits and the role of the financial system and markets are central. In Walras' words:

"The diversion of productive services from enterprises that are losing money to profitable enterprises takes place in various ways, the most important being through credit operations, but at best these ways are slow. It can happen and frequently does happen in the real world, that under some circumstances a selling price will remain for long periods of time above cost of production and continue to rise in spite of increases in output, while under other circumstances, a fall in price, following upon this rise, will suddenly bring the selling below costs

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[162] Walras, p. 380.

of production and force entrepreneurs to reverse their production policies. For, just as a lake is, at times, stirred to its very depths by a storm, so also the market is sometimes thrown into violent confusion by crises, which are sudden and general disturbances of equilibrium. The more we know of the ideal conditions of equilibrium, the better we shall be able to control or to prevent these crises."[163]

The stationary state corresponds to a situation of long-term full equilibrium where: *"the selling price of products equals the costs of the productive services used in making them"* is clearly an analytical point of departure. This ideal state does not correspond to the historical empirically observable situation where prices diverge from costs, where there are profits and loses, where credit and capital markets operate, where resources are re-allocated continuously from industry to industry, where output and prices vary, where crises happen, and where the process towards a theoretical stationary state of full general equilibrium takes place through extended periods of time: *"without ever actually attaining it."* Walras view of the reality of a modern capitalist economy is that of a continuous equilibrium, where the economy is always in a temporary equilibrium and this is different from day to day, moment to moment. This vision is different from the perspective of the standard neoclassical and the New Classical views which consider that the economy is in reality most of the time close to, if not in, a full equilibrium, where observed fluctuations correspond to 'efficient' resource reallocations. As long as there are profits and loses, credit operations, migration of investment within and among industries, because prices are different from costs, among other dynamic changes, for Walras the real economy is in a temporary short term equilibrium. Needless to say, in such a temporary equilibrium, markets can clear, but resources are not necessarily fully employed, output is not necessarily at its maximum level, money and financial markets matter, and all the good things that correspond to the ideal Smithian end state do not entail.

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[163] Walras, p. 380-1.

The original developments of growth theory as exemplified by the works of Harrod, Domar, Kaldor and the neoclassical generalization of their contributions by Robert M. Solow, were concerned with the long term hypothetical sate of an economy growing while at full employment, a situation where Walras' Law and the prices equal costs conditions apply. In the neoclassical growth theory case, implicitly or explicitly this meant capital and labour being remunerated at their marginal productivity levels. The problem being wether equilibrium paths from arbitrary initial conditions tend to a steady state, that is, the models are concerned with the structural characteristics of steady states and their asymptotic stability. The definition of steady states vary, often it is an evolution along which output and the stock of capital grow at the same constant rate. This kind of theorizing was considered suitable to address some of the long term development problems[164], as the secular 'natural' rate of growth, the impact of technical progress and population changes, physical capital accumulation, etc., etc. Without any pretense about their applicability to the short term real world problems of employment, output determination, cycles and fluctuations, financial crises, among others. Nevertheless, the original moderate view of the founders of growth theory has been challenged: the single good-single agent theoretical models, can be used to account for short term phenomena. It can explain not only the secular growth trends of advanced economies—something that for the founders did with serious limitations and cualifications[165]—but also it could explain business cycles, depressions, for example *the Great Depression,* and

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[164] "There is nothing in growth theory to require that the steady-state configuration be given once and for all. The usefulness of the theory only requires that large changes in the determinants of steady states occur infrequently enough that the model can do meaningful work in the meanwhile. Then the steady state will shift from time to time whenever there are major technological revolutions, demographic changes, or variations in the willingness to save and invest. These determinants of behavior have an endogenous side, no doubt, but even when established relationships are taken into account there will remain shocks that are too deep or too unpredictable to be endogenized. No economy is a close approximation to Laplace's clockwork universe, in which knowledge of initial positions and velocities is supposed to determine the whole future." Robert M. Solow.

[165] "Moreover, ever since Kaldor's catalogue of "stylized facts" [Kaldor (1961)], it has generally, if casually, been accepted that advanced industrial economies are close to their steady-state configurations, at least in the absence of major exogenous shocks. The current vogue for large international cross-section regressions, with national rates of growth as dependent variables, was stimulated by the availability of the immensely valuable Summers-Heston (1991) collection of real national-accounts data for many countries over a fairly long interval of time. The results of all those regressions are neither impressively robust nor clearly causally interpretable. Some of them do suggest, however, that the advanced industrial (OECD) economies may be converging to appropriate steady states." Robert M. Solow.

basically every other economic problem. It became in the words full of hope of Robert Lucas: "the only 'engine for the discovery of truth' that we have in economics."[166] Given the explosion of publications with this approach and that many very important graduate schools of economics[167] lately have been adopting the New Classical perspective, in particular neoclassical growth theory applied to the short and to the long term, as if it was the *only engine for the discovery of truth*, it is worthwhile to take a closer look at this contemporary current in the field. Prescott himself provides us with an excellent summary of growth theory, business cycles and the Great Depression among other questions, the long quote is justified:

"The now-textbook [growth] theory includes two basic decisions. One is the consumption-investment decision, [...] Less consumption and more investment today can increase consumption in the future. The other decision is the labour-leisure decision. (Leisure is shorthand for productive time allocated to nonmarket activities and not leisure in the conventional sense of the world.) More labour and less leisure today results in more market output today. This added output can be used for greater consumption today or for greater investment today, which permits greater consumption in the future [...] if technology advances smoothly and there are no changes in market distortions, the economy grows at a steady rate with constant shares of output being allocated to consumption and investment and a constant fraction of time being allocated to the market. The theory predicts the consequences of changes that affect the constraints people face [...]

Growth theory without the labour-leisure decision was developed to account for secular growth. With the natural extension to include the labour-leisure decision, the theory has proved successful in accounting for phenomena other than what it was designed to explain [...] Another dramatic empirical success of growth theory is in the study of business cycle foundations. The

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[166] In Lucas, Robert E. "Models of Business Cycles." Pp. 108.
[167] See for example the catalogue of doctoral courses in economics at the Massachusetts Institute of Technology, MIT, available in MIT OpenCourseWare, http://ocw.mit.edu

developers of growth theory thought the theory would be useful for studying long-term growth issues but that a fundamentally different theory would be needed for studying business cycle fluctuations. Once the implications of growth theory were derived, however, business cycle fluctuations turned out to be what the theory predicts [...]

The Great Depression and business cycles are fundamentally different in terms of magnitude and persistence [...] business cycles are responses to persistent changes, or schocks, that shift the constant growth path of the economy up or down. This constant growth path is the path to which the economy would converge if there were no subsequent shocks. If a shock shifts the constant growth path down, the economy responds as follows. Market hours fall, reducing output; a bigger share of output is allocated to consumption and a smaller share to investment; and more time is allocated to leisure. Over time, market hours return to normal, as do investment and consumption shares of output, as the economy converges to its new lower constant growth path. The level of the new path is lower, not the growth rate along the path.

I've just described the response of the economy to a single schock. In fact, the economy is continually hit by shocks, and what economists observe in business cycles is the effects of past and current shocks. Business cycles are, in the language of Slutzky (1937), the "sum of random causes".

The fundamental difference between the Great Depression and business cycles is that market hours did not return to normal during the Great Depression. Rather, market hours fell and stayed low. In the 1930s, labor market institutions and industrial policy actions changed normal market hours. I think these institutions and actions are what caused the great Depression."[168]

Prescott does not explain what random cause shifted the economy down and initiated the Great depression, what changes or policies took place or even suggests a possible explanatory mechanism, but strongly concludes that the great depression that engulfed the world in the thirties, happened because

workers decided to work less. Needless to say, this is a straightforward conclusion from the 'only engine for the discovery of truth' that this group of economists use. If in their world fluctuations in output can only be explained by changes in technology or in the level of employment given technology and, after more than twenty years[169] of trying to find without success what technological shocks could have caused the Great Depression, for example, only changes in the 'labour input' could 'explain' it. The single agent model requires that individual behavior is rational and voluntary, so the only explanation left in the context of the 'only engine for...' is that for some reason: "the unintended consequence of labor market institutions and industrial policies designed to improve the performance of the economy." [170] workers decided to increase their leisure during the Great Depression. Prescott's argument is an implicit recognition of the incapacity of this approach to explain such an important phenomenon with consequences that changed the world.

An alternative view from the New Classical economists, is found in another group of academics loosely related among them, the so called New Keynesians, the proponents of what is also called the New Keynesian economics.[171] In general they accept the integration of rational expectations to macroeconomics, the consequences of the Lucas critique on econometric models, and more or less the integration of the labor markets to the IS-LM framework and the aggregate

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[168] Prescott, Edward C. "Some Observations on the Great Depression" Federal Reserve Bank of Minneapolis. Quarterly Review. Winter 1999, vol. 23, no. 1, pp. 25-31

[169] Counted from the publication of Finn E. Kydland and Edward C. Prescott, "Time to build and aggregate fluctuations" Econometrica 50 (1982), pp. 1345-70

[170] The intellectual leader of the RBC school, Edward C. Prescott, writes: "From the perspective of growth theory, the Great Depression is a great decline in steady-state market hours. I think this great decline was the unintended consequence of labor market institutions and industrial policies designed to improve the performance of the economy. Exactly what changes in market institutions and industrial policies gave rise to the large decline in normal market hours is not clear. But, then, neither is clear why market hours are so low in France and Spain today.The Marxian view is that capitalistic economies are inherently unstable and that excessive accumulation of capital will lead to increasingly severe economic crises. Growth theory, which has proved to be empirically successful, says this is not true. The capitalistic economy is stable, and absent some changes in technology or the rules of the economic game, the economy converges to a constant growth path with the standard of living doubling every 40 years. In the 1930s, there was an important change in the rules of the economic game. This change lowered the steady-state market hours." In: "Some Observations on the Great Depression" Federal Reserve Bank of Minneapolis Quarterly Review Winter 1999, vol. 23, no. 1, pp. 25-31.

[171] See for example Romer, David "The New Keynesian Synthesis" Journal of Economic Perspectives. Winter 1993. pp. 5-22.

supply and demand model of modern macroeconomics. However, they stress the existence of market imperfections and market failures, and the implications of these problems for the evolution of the economy. These scholars have studied for example the role of nominal rigidities in wages and prices (i.e. Stanley Fisher, John Taylor, George Akerlof); of capital market failures (i.e. Joseph Stiglitz and Grunwald), among other market imperfections, and their impact in aggregate fluctuations. Notwithstanding major differences, both groups share a significant part of the core views of standard economics, a new sort of centrist consensus around the expanded IS-LM short term and the aggregate supply and demand medium term analysis. However, at the policy formulation level and obviously in political views, there are extreme discrepancies between these two major contemporary currents in economic thought. Say's Law or Walras' Law, has withstood the attacks of the early Keynesians, the individual rationality principle is alive and well as an analytic principle, the problem now is dealt with as an informational situation in probabilistic settings. The consideration of the concept of a natural level of real output as a function of a natural rate of employment or un-employment implies, explicitly or implicitly, the acceptance of the existence of a competitive equilibrium determined á la Walras, which as we saw does not entail optimal results. Among the issues debated are the length of the period of adjustment of prices and wages, that is the analysis of nominal rigidities, and the character of fluctuations. It is recognized by everybody that exogenous variations in the aggregate demand, consumers' confidence, fiscal deficit, trade deficit or changes in the money supply, among other forces, affect in the short term the level of real output, nevertheless it is also recognized that in the medium term it will tend to its natural level. New Classical economists and RBC theorists, followers of the old school monetarists, will say that the short term is very short, that is the economy is always on or very close to a competitive equilibrium, with all the efficiency and optimality implications of such a situation. And that most fluctuations in output should be explained by real variables, mainly technology and consumer preferences. The room for active economic policies is minimum and developmental advice is reduced to waiting. The more radical New

Keynesians will say that the short term can be very long, that the effects of aggregate demand variations can be very long and persistent and very significant deviations in output from its natural level can be caused by market failures. For these scholars, there is ample room for activist economic policies.

What these contemporary views also share is a severely limited view of financial markets, in particular capital markets. For the New Classicals and the RBC theorists, they simply do not matter, they are not considered. In the standard IS-LM macro model, the financial market is reduced to money and to a single financial asset: a government issued bond. The theory behind the LM analysis is indistinguishable from the ancient loanable funds theory, and so it is the liquidity preference 'Keynesian' version, without the speculative motive. Capital markets are not part of the core analysis. Needless to say, several diverse authors have analyzed the demand of money in a wider perspective by incorporating in the analysis a variety of financial assets and other commodities that affect the demand for money. Other authors as James Tobin and followers have developed a much more interesting analysis in terms of portfolio theory. Modern financial economics and practice relies on the net present discounted value of future cash flows, as the mechanism to determine the prices of financial or capital assets, a mechanism not reducible to classical value theory. Also, alternative views on capital markets (For example, Stiglitz and Grunwald) have provided considerable insight on the dynamic interaction of real and financial forces, among other important but partial contributions. Nevertheless, the more radical original Keynes' analytical proposal regarding the need for a general theory to deal with the short term fluctuations of employment and output, incorporating in a consistent way the theory of value, has not been accomplished. In Keynes' vision such a theory would rely on the interaction of real and financial forces in the amplest sense.

In terms of our analysis, the theoretical system of classical economics needs to be completed with the integration, in an essential way, of the financial

dimension characteristic of modern capitalist economies. To understand the dynamics of a modern capitalist economy we need to elucidate the relationships between the rate of profits, the rate of interest and capital accumulation. An integrated account of financial markets and commodities markets is essential, both sides of the balance sheet of an economy need to be analyzed, the financial structure of an economy matters. In the short term markets clear, but this is a temporary equilibrium that does not correspond to full employment equilibrium and does not have optimal properties. Only when prices are equal to costs then the Smithian and Walrasian long term results entail. The existence of temporary positive residual profits, the variability on the profitability of capital that can result from a succession of temporary equilibria, the accumulation of capital as tradeable property rights with a potentially high fluctuating value, dependent on future residual profits and on variations of the interest rate, are phenomena that can affect the demand for money rendering it highly unstable and that can generate effects that alter Says' Law in one way or another.

The research programme that I will follow, would be to develop a theory that integrates Say's Law and the workings of competitive markets, in a wider framework that admits a continuum of general equilibrium temporary positions, where the Smithian ideal end point is just one of them. My perspective would be based on the individual rational actions of consumers and firms, but also would recognize that rational human actions can have unintended consequences, that is systemic effects that cannot be reduced to the behavior of a single agent, representative or not. Such a general equilibrium approach would require the adoption of the two classical equilibrium conditions, in the short and in the long term: Say's/Walras' Law, and, in the long term only: prices equal costs. This will allow us to consider profits as a residual determined in real terms, as a temporary[172] general equilibrium phenomenon; to find a way to determine the economy's general rate of profit; then to study the problem of the determination of the value of capital and its variations, establishing the way the profit rate

interacts with the interest rate considering real and monetary forces, and considering how the dynamics of capital affect the short and long term dynamics of the economic system, in particular cycles and financial crises. This alternative option would concentrate in the core problems of the classical theoretical system that are still relevant for contemporary economics, and in the study of the complex dynamic processes whereby, real world economies, converge or not, either in a stable or in an unstable manner, towards a long term equilibrium where the optimal results of free markets can be realized. A 'classical' study of these processes would concentrate the analysis in the generation of profits, the profitability of capital and in its long term trend. A true contemporary 'classical' approach would also integrate fully the monetary and financial forces at play.

5.3. An epistemological note on the New Classical economics.

Prof. Blaug wrote and concluded the Preface to the second edition of his classic book on the methodology of economics, stating: "I document in this book a striking continuity in the methodological precepts of modern economics, precepts that loosely correspond to Popper's falsificationist strictures. But at the same time, there is no denying that the practice of economics is at best an innocuous brand of falsificationism and at worst a Millian style of verificationism." And, "...the Methodology which best supports the economist's striving for substantive knowledge of economic relationships is the philosophy of science associated with the names of Karl Popper and Imre Lakatos. To fully attain the ideal of falsifiability is, I still believe, the prime desideratum in economics." [173] Unfortunately, the interest of economists and other social scienctists in the analysis and the development of their own discipline and praxis from the perspective and with the aid of the philosophy of science, has subsided since Blaug expressed these considerations. A side effect, or may I say an unintended

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[172] The term is used by Hicks, a temporary equilibrium is a situation where markets clear, Say's Law or Walras' Law holds, but the economy is not in full employment. It is out of the full employment growth path.
[173] Blaug, Mark. "The Methodology of Economics" Or how economists explain. Second Edition 1992. Reprinted in 1997. Cambridge Surveys of Economic Literature. Cambridge University Press. 1997. Pp. xx.; xxiii.

consequence, of the lack of substantial advancement on the Popper/Lakatos tradition and of the politically correct methodological pluralism now in vogue, is that the prevailing "innocuous falsificationism"[174] of the early 90s has become a rampant Millian verificationism. As if nothing had happened in the philosophy of science since the times of John Stuart Mill's "System."[175] Popper starts with a definitive critique of the 19th century view of science that maintained that science differs from nonscience, by virtue of the use of the method of induction. This method states that scientific knowledge begins with experience, then through a process of observation and experimentation, and with the aid of the rules of induction leads to the generalization of propositions or universal laws about the real world. These laws and propositions are said to be based on facts, that is they are proven, or verified.[176]

It is in this particular context: the destruction of the myth of induction; that Popper established his demarcation criterion. It is logically impossible to derive general laws from particular observations. It is impossible to "prove" theories based on facts, the probability of "proving" a theory based on a finite number of observations is always zero.[177] For Popper, then, if science cannot prove its theories, directly or probabilistically, science can refute theories that are false. It is possible to refute with absolute logical certainty what is false: hence scientific knowledge is that type of knowledge that, at least in principle, can be proven false.[178] There is a fundamental assymetry between proving (logically impossible)

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[174] Op. cit Pp. 111.

[175] John Stuart Mill "System of Logic, Ratiocinative and Inductive" (1843)

[176] "...it is common to encounter statements like: all science is based on induction; deduction is merely a tool for clear thinking that cannot serve as an instrument for gaining new knowledge, being a kind of sausage machine that only produces at one end what must have gone in at the other; only by induction can we learn something new about the world and, after all, science is the accumulation of new knowledge about the world. This point of view, which is virtually a paraphrase from John Stuart Mill's *Logic*, is simply a frightful muddle of words. It supposes that induction is the opposite of deduction and that these two are the only methods of logical thinking." Blaug, Mark. Op. cit Pp. 17

[177] "...en condiciones muy generales todas las teorías tienen probabilidad cero sea cual sea la evidencia: *no sólo todas las teorías son igualmente imposibles de probar sino que tambien son igualmente improbables.*" Lakatos, Imre. "La metodología de los programas de investigación científica" Alianza Editiorial S.A. Madrid, 1983. AU 349. Pp 21-22

[178] Falsificationism is defined as: The methodological standpoint that regards theories and hypothesis as scientific if and only if their predictions are, at least in principle, empirically falsifiable; "naive falsificationism" holds that theories can be refuted by a single test—for example, a crucial experiment—"sophisticated falsificationism" holds that it requires a large number of tests to refute a theory. Against Falsificationism, the

and disproving (logically possible). To marry Popper's demarcation criterion to a logic of scientific inference or induction, whatever its particular form, in what has become a sort of standard procedure in some quarters today, and in *the* standard procedure for the New Classical economists, for whom statistical verification is the standard of truth. Is, at the very least, an incorrect interpretation of the principle of falsifiability, if not an (in)voluntary travesty of the Popperian methodology.

If scientific knowledge is essentially one, then the methodology of science has to be one too. This is what Popper in *"The Poverty of Historicism"* called the doctrine of methodological monism—"all theoretical or generalizing sciences [should] make use of the same method, wheter they are natural sciences or social sciences."[179] It should be obvious that if Popper's fundamental and definitive critique is leveled against inductivism, his strictures regarding methodological monism, cannot be interpreted or reduced to the adoption of an inductive or inferential logic as "the" method, or the "content" of science, or as science[180] itself. Which is exactly what vulgar verificationists do.

In the particular case of the social sciences, Popper also prescribed the principle of *methodological individualism*: "the task of contemporary social theory is to construct and analyse our sociological models carefully in descriptive or nominalist terms, that is to say, *in terms of individuals,* of their attitudes, expectations, relations, etc."[181] This principle was argued by Popper as an antidote against the vice of speaking about social wholes, as entities with a life of

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methodological standpoint of *Verifiability* states that theories and hypotheses are scientific if and only if their predictions are, at least in principle, empirically verifiable. I will define as *Verificationism,* the a-critical adoption of the *Verifiability* standpoint, either in a deterministic or probabilistic form, without an explicit consideration of the induction problem; and, as *Vulgar Verificationism,* the reduction of the *Verifiability* standpoint to a particular form of inductive logic whatever its form. A sophisticated adoption of the *Verifiability* standpoint, should rest on the refutation of Popper's ideas and in an alternative to Popper's reformulation of the Humean problem of induction. I do not see this happening any time soon.
[179] Popper, Karl. "The Poverty of Historicism" 1957. London: Routledge & Kegan Paul.
[180] A definition of science consistent with Popper's and Lakatos' view is: "it is the desire for explanations that are at once systematic and controlled by factual evidence that generates science; and it is the organization and classification of knowledge on the basis of explanatory systems that it is the distinctive goal of the sciences." Nagel, E. "The Structure of Science. Problems in the Logic of Scientific Explanation." 1961. p. 4. London: Routledge & Kegan Paul.

its own driven by forces that are independent of individual human actions, and as such is fundamentally correct. But Popper also established that it was the goal of the social sciences to study the unintended consequences of individually rational decisions. In other words, Popper not only recognized the existence of systemic effects—unintended consequences—derived from rational human actions, but made their study central for the social sciences. Popper's original postulates should, at least, make extreme methodological individualists pause, before stating, for example, that the macroeconomy is simply the sum of the microeconomy.

What is particularly disturbing is that the modern mainstream in economics and in the North American social sciences, tend to claim for themselves the heritage of Popper, by working in strict accordance with the principles of falsification, methodological monism and methodological individualism. When in practice what they follow is a revival of the 19th Century inductivism, the same that Popper and others irrevocably demolished, a vulgar verificationism now disguised as Scientific Inference[182]. The most notorious examples of this trend are the so-called New Classical economists, and the Scientific Inference advocates for the social sciences. These currents have defaced the value of the philosophy of science as a guide for what is science and what are the appropriate methodological scientific standards. In the particular case of the latter, science is what scientists do; scientific research is an ideal type of qualitative or quantitative research; scientific research, is good research; and good research is one that follows the rules of statistical inference; then you have Scientific Inference! Hence, science is good statistics applied to qualitative and quantitative research.

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[181] Popper, Karl. (1957) Pp. 130-136.
[182] As an example of this quite common view: "The content of 'science' is primarily the methods and rules, not the subject matter." See "Scientific Inference in Qualitative Research" Gary King, Robert O. Keohane and Sidney Verba. Department of Government Harvard University. "Scientific Inference in Qualitative Research" 1995. Chapter 1. The Science in Social Science. p. 8. For these authors the method is statistical inference.

The epistemological posture of the New Classical economists is a travesty of Popper's methodological monism and individualism. The conception of the economy as a single utility maximizing rational agent, is presented as the paradigm of methodological individualism. And their idea of methodological monism, is reduced to the use of dynamic games theory to analyze the decisions of this paradigmatic individual. Falsification is forgotten and the world is reduced to available statistics, using econometrics to prove or verify 'theories' conceived as if/then propositions without any necessary connection to an explicitly defined theoretical system. More often than not, general equilibrium is invoked but its optimal results, á la Walras and A&D, are assumed. The growth of knowledge is conceived as the endless accumulation of empirical propositions. Á la Prescott, systemic effects, unitended or undesired consequences of rational human actions, are reserved for governmental policies and labor institutions, only. They never arise from the rational behavior of the representative individual at the core of their analysis.

6. Summary and Conclusions: Towards a Classical Research Programme for Political Economy.

From a contemporary perspective, the analysis of the conditions for the long term sustainability of alternative social modes of organization for the creation and the distribution of wealth, can be considered as the central theme of classical political economy. Adam Smith's *Wealth of Nations* concentrated in the generation of goods and services, positing a free market, as the most conducive form of social organization to increase production. Smith saw in "the obvious and simple system of natural liberty" the solution to the moral problem of the compatibility between private gains and the common good, assuring the sustainability of the social order. David Ricardo defended free markets on the grounds that they would generate more and cheaper products, resulting in positive profits that would sustain capital accumulation, the understanding of the 'laws' that determined the distribution of wealth was central. In the short run Ricardo saw the essential problem in the determination of the rate of profits, which would determine the level of capital accumulation, output and wealth. In the long run, as long as markets where free, output would expand to its maximum possible as determined by the fecundity of earth, the costs and productivity of labor, profits would dissapear and the product would be distributed in the form of rents and wages. Karl Marx saw in the reality of the XIX Century world a social mode of organization of production and distribution based on the existence of antagonistic social classes, and postulated that the capitalist mode of production was not sustainable in the long-run. The focus on the wealth of nations, required an analysis of the long-term dynamics of economic development. The volume of production or output, was dependent on the volume of accumulated physical capital. Capital accumulation was a function of profits and/or the rate of profits. The core of classical analysis concerned itself with the production and distribution of wealth and focused on the relationships between profits, capital accumulation, production and population growth, to explain the dynamics of the system. All of the above in an institutional setting characteristic

of a competitive private enterprise economy. This is the domain of classical political economy.

The rates of rents, profits and wages played a key role in the secular process, their determination, went hand in hand with the determination of the rates of exchange between different goods and services, thus a theory of value, and a theory of distribution were essential. However, the different particular theories of value and of rent and population, were auxiliary tools for the study of the generation and distribution of wealth. They were not the main analytical object. The long-term sustainability of modern economies was inextricably linked to the evolution of profits on capital. Smith and Ricardo, saw an eventual future of stagnation. For Smith, an excess of capital relative to profitable opportunities would drive down profits and hence stop capital accumulation. For Ricardo, the scarcity of natural resources would in time push up rents to a point where actual profits would not justify additional investments. In Marx, not only capital accumulation would eventually stagnate, but the capitalist mode of production would also collapse and socialism would emerge.

The classical theoretical system confronted the problems of value, distribution and the long-term dynamics of modern capitalist economies. These problems required the elucidation of the nature of profits, capital, the rate of profit and the determination of its long-run trend. The classics implicitly used the model of a pure free market, perfect competition in modern parlance, to address the problem: How to explain the emergence of profits if trade was conducted strictly in terms of equivalent values? If prices were 'natural prices', and all commodities were traded according to their equilibrium values, how was it possible that a surplus value could appear? For Marx the dividing line between classical economics and vulgar economics, was here: classical economists would solve the problem of the emergence of profits under conditions of exchange at market values, vulgar economists would not. As Walras would realize in time, this condition implied a pure competition and general equilibrium approach, the

acceptance of Say's law of markets, and the consideration of money as a medium of exchange only. Hence the validity of the classic quantitative theory of money. It is within this theoretical system that answers to the classical problem of the emergence of profits can be grouped around two perspectives on the issue: Profits as a real cost, the *price* of capital, in the Smithian tradition. Or profits as a residual after costs, in the Ricardian tradition. These two perspectives share a common analytical framework, however the different concepts of profits and capital that distinguish them, imply radically different conclusions in terms of the short and long term dynamics and sustainability of modern economies.

In the case of Smith the rate of profit is seen as a price, the price or the cost of capital, dependent on the supply and demand conditions for it. In the case of Ricardo and Marx, the profits accrued to capital were considered as a surplus or as a residual left over from the total net output after paying rents and wages, that was appropriated by the entrepreneur or the capitalist that had control over the production process. Marx, "solved" the problem of the emergence of profits in an equilibrium where every commodity is traded strictly according to its labor value, by introducing a special commodity: the labor force. The labor force is traded in strict accordance with its value in exchange, but the labor force is a commodity that has a unique value in use, it creates value. Laborers are forced to work for more time, than the necessary time to pay for wage goods, they are exploited. The Ricardian analysis of profits presents two different scenarios, first the long term equilibrium where output reaches its maximum as determined by the amount of accumulated capital, and where profits as a residual dissapear due to competition. This is equivalent to the long term Smithian equilibrium, however in the Ricardian conception, the level of profits is zero, while in the Smithian version profits correspond to the long term or "natural" price of capital. The second Ricardian scenario, which I have termed short-term, consists in considering the level and the composition of output, that is of aggregate demand, as given, then we can have positive profits as a residual, by considering as given the level of wages. If profits are not a residual but a cost, á la Smith, the total

product then is equal to the sum of all individual prices and is equal to the sum of the total wages, rents and profits. This is the Smithian result that most puzzled David Ricardo: the total product should be determined independently of the prices of its components. Prices are a measuring device and should not affect the magnitude of what is being measured. Hence the need for a theory of value that is independent of distribution. Initially Ricardo avoided the problem of relative prices by assuming an economy with a single good, i.e. corn, as the only input and output of the system. To address the reality of an economy with multiple goods, he tried to develop a labor value theory where changes in the distribution of output did not affect the relative prices of commodities and hence the value of total output. He was never able to solve this problem himself. Marx offered a solution in the so-called transformation of values to prices, as Ricardo's, Marx's formulation was also logically inconsistent. Nevertheless, the consideration of the nature of profits as a residual not as a cost, is independent from the labour value theory in its different versions.

With respect to capital, the classical economists' theoretical system shares at the most essential level the conceptualization of capital as a set of physical heterogeneous objects, the means of production, commodities that come from the past and that can be accumulated to produce more commodities. This posed a crucial problem: if capital is a set of commodities how can we solve the problem of the determination of the 'natural price' of capital as something distinct from the prices of the commodities that constitute capital? Ricardo tried to clarify this problem with his analysis of the single good economy—an analytical construct that with hindsight we might say has contributed more to confuse than to clarify the study of modern economies. With this approach we "solve" the problem of the heterogeneity of capital and of the determination of its value by assuming it away. The logical puzzle of Ricardo has a solution and it is the Sraffian solution, which dispenses with the labour value theory(ies), but it is forced to assume as given the level of aggregate output and demand, otherwise in the Ricardian logic, profits are zero. Marx also starts and mainly stays within

the tradition of capital as a set of heterogenous means of production with a value determined by aggregation.

In summary, the theoretical system of classical political economy dealt with the generation, the distribution and the growth of wealth. Ultimately, wealth was conceived as dependent on the accumulation of physical capital, hence the conceptualization of profits played a key role in the system. As analytical principles the classics postulated that the exchange of commodities should be carried on in terms of strict values, every commodity should be traded for other commodities of equal value, relative prices should be determined strictly in accordance to this rule. The previous postulate implied of course the existence of free market conditions, pure competition in modern terms, and the acceptance of Say's Law of markets, as an economy wide equilibrium condition. To analyze the exchange of commodities under free market conditions the classics developed various labour theories of value, which all proved to be inconsistent. Of course, a theory of value is required, however, the classical theoretical system as defined is not characterized by and it is not logically dependent on any particular theory of value whatsoever. In general, the classics adopted a view of prices where "market" or observable prices would move around or gravitate towards "natural" or equilibrium prices, that would reflect the "natural", "general" or "average," remunerations of land, labour and capital. With this the classics established what we can term as a second distinct global equilibrium condition, prices equal costs, the long run equilibrium condition par excellence. These views implied an approach that considered the economic system as a whole, in contemporary terms: a general equilibrium approach. For the classics, real world economies were always in the short term, that is prices were always different than costs, market prices differed from natural prices, and the long term equilibrium adjustment process, was characterized either by a trend towards stagnation, or a stationary state, as in Smith and Ricardo, or by continuous fluctuations and instabilities, as in Marx. The key for the understanding of the dynamics of real world economies was in the generation of profits, the profitability of capital and in

its long term trend. The analysis of monetary phenomena by the classics can be summed up by the classical quantity theory of money, which relegated the influence of monetary factors to the realm of short term temporary effects at most, without providing any essential link between the forces at the production level, real determinants, and monetary forces like the interest rate, the money supply, capital markets, etc., etc. The world of finance does not occupy an analytical space with the classics, there are, nevertheless, innumerable historical, anecdotical, practical and policy references. All the classics shared a conception of capital in physical terms, however, it is in the conceptualization of profits where the main cleavage of classical economics is to be found, profits are either a cost, as in the Smithian perspective, or profits are a residual, as in the Ricardian perspective. Given the privileged position of profits at the core of the theories of capital accumulation, value and distribution, as well as in modern financial economics, the analytical and practical consequences of the aforementioned divide reach to the whole of economics.

Paraphrasing Prof. Blaug's question: Is there a 'core' of the classical theoretical system as defined? A core, in the sense of a set of problems that can be considered fundamental or essential within the classical theoretical system and that are relevant for contemporary economics, so that theoretical research in this respect can be considered 'classical'. My answer would be yes, and it is the study of the complex dynamic processes whereby, real world economies that are always in the short term, that is market prices are different from natural prices and profits are different from zero, converge or not, in a stable or in an unstable manner, towards a long term equilibrium where prices equal costs. A 'classical' study of these processes would concentrate the analysis in the generation of profits, the profitability of capital and in its long term trend.

The adoption of a Smithian perspective on political economy is the trademark of neoclassical economics: the focus on the determination of prices and total wealth through the role of competitive markets. The continuity of the

classical system in this respect is remarkable: at the hard core we have one main, relatively consistent, approach that results from the Smithian competitive pricing mechanism, the so-called "invisible hand," coupled with Say's Law of markets. The workings of such a mechanism, through prices and quantities adjustments, in individual markets of commodities first, and then as a derivation in the markets for labour, land and capital, will result in the maximum output possible, at the minumum cost, given that wages, rents and profits, as the cost of capital, will be remunerated in the end at their natural rates. For Smith this was a long run hypothetical result from his "system of natural liberty": it would be necessary to get rid of every form of mecantilism and to establish the appropriate social and political institutions, before truly free markets could be expected to produce such results. Nevertheless as it is known now, in the meantime we have no way of knowing if we are close or far from this ideal result.[183] In the short term market prices differ from natural prices; land, labor and capital are remunerated at rates different from their natural rates, Say's Law, of course, holds at every point in time. But only when prices reach their natural level, that is when they are equal to the amounts of land, labour and capital, required for their production as technically determined, times the natural rates of wages, rents and profits, the economy reaches its full long term equilibrium. Other than at this ideal point the actual or market level of wealth is not determined. Needless to say, the classical Smithian proto-theory of wealth determination required a consistent theory of value to support the workings of the free market mechanism as postulated.

Within the theoretical system of classical economics, the central problem to be solved was the question of value, that is of the relative prices of commodities, including those used for production. Walras understood this clearly and made this problem the starting point of his work. As Walras expressed it: "*Pure Economics,* is in essence, the theory of the determination of prices under a hypothetical régime of perfect competition." For Walras a consistent solution to the question of value was the necessary initial step in order to develop a *Theory*

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[183] In modern terms this is the Lipsey-Lancaster Theorem: When an economy is not in a first-best optimum

of Social Wealth, as the second part of the title of the *Elements* states. The problem of economics then, was to establish the conditions under which given resources, land, labor, capital, raw materials, or in general, productive services, were allocated among competing uses, generating maximum consumers' satisfaction, the vector of prices that produced this result was the equilibrium solution. The central element of the neoclassical theory of value, as it came to be known, was the principle that economic behavior is maximizing behavior under constrained conditions. The allocation problem has a maximum solution, if and only if, the transferring process is subject to diminishing returns: the more a consumer enjoys a particular good the less utility it derives from it; the more labor we apply to a certain given task the less productive it becomes. Again, this is valid for households allocating income to different uses, thanks to the law of diminishing marginal utility that ensures that an optimum exists. And for firms searching for optimal factor purchases, the allocation problem has a solution thanks to the law of diminishing marginal productivity. This was an extension of the Ricardian theory of rents, to capital and labour. In modern terms, these two laws are particular cases of the equimarginal principle that applies only to definite quantities of money, time or any other resources to be allocated or distributed among competing uses, by a maximizing agent.

Neoclassical economists treated distribution theory and factor pricing as part of a general value theory. The neoclassical theory of value aimed to provide the Smithian classical proto-theory of wealth determination with the logical foundation it did not have and presented a theoretical alternative to the Ricardian theory of distribution from within the system. Nevertheless, the theory of profits it offered, within the Smithian perspective of profits as a cost, relied on a notion of capital as a physical entity with a productivity of its own and depended on the assumption of the strict applicability of the equimarginal principle to the substitution of capital for labour in production, at least in the early phases of general equilibrium analysis and until these days within the neoclassical

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there is no way of telling wether a given change takes us nearer or further away from the first-best optimum.

production function tradition. These last two neoclassical developments: the original Walrasian general equilibrium approach, and later the production function approach initiated by Knut Wicksell with the refinement of Böhm-Bawerk's capital theory and followed by many others are closely related, but they cannot be assimilated to each other, it might be argued that in their modern versions they are essentially different.

Lets consider the production function approach that relies directly on the equimarginal principle. It is argued that in perfect competiton given the initial endowments, that is the distribution of resources among households, the economic system as represented will generate inverse monotonic relationships between the physical quantities of the diverse factors and the corresponding rates of remuneration, and hence the system will converge to the full employment of all factors resulting in an efficient and stable equilibrium, the value of total output will be exactly the same as the aggregate value of all remunerations, rents, wages and profits determined by the marginal productivity of land, labour and capital. Nevertheless this result is obtained, if and only if, the production function $Y = f(T, L, K)$ is of a particular form that satisfies Euler's Theorem, only then the equation:

$$Y = (dY/dT)T + (dY/dL)L + (dY/dK)K \; ;$$

will hold together with Say's law:

$$Y = R + W + P \;.$$

Only in this particular case, that corresponds to a very particular conception of the cost of capital as the marginal productivity of capital, the two classical equilibrium conditions: Say's Law, valid in the short and in the long term; and prices equal costs, valid in the long term only, come together. With the implication that Smith's and Ricardo's long term, becomes a short term result only: prices are always equal to costs, total wealth is always maximized, the economy is always employing fully all available resources. No wonder the classic's and also Walras' long term condition, that prices equal costs has been practically abandonned in the modern literature as such, it has become an

implicit assumption. It seems now that only the market clearing condition is enough.

Joan Robinson in her famous essay "The Production Function and the Theory of Capital" (1953-1954) re-opened the attack on the neoclassical conceptualization, attack that started the famous "capital theory controversies." She concentrated the critique on the neoclassical concept of capital. In short she argued that capital as employed in production functions could not be used to determine the interest rate or the profit rate and hence the distribution of output, because the aggregate value of capital depended on prices and hence on the distribution of income. Capital was a set of heterogeneous capital goods and could not be reduced to a single homogeneous entity with a dimension independent of prices. The publication of Piero Sraffa "Production of Commodities by Means of Commodities" in 1960, constitutes another landmark in the capital theories' debate, thanks to the discovery of the phenomenon of "re-switching of techniques" or "reverse capital deepening." Sraffa argued that as variations take place in income distribution between profits and wages, the production techniques that are chosen as the most profitable ones, do not follow each other in an unambiguous and unchanging order. The production techniques that require a high proportion of capital to labour at a low rate of profits may well be discarded by other (more profitable) techniques when the rate of profits is higher. The former production techniques may become the most profitable techniques once again at even higher rates of profit. These results are valid, whatever convention may be adopted to "measure" capital. From the capital controversies the following two generally accepted central propositions emerged: The conditions to be satisfied in order to aggregate heterogeneous capital goods are so extraordinarily restrictive as to rule out any reasonable possibility of constructing an aggregate physical measure of capital goods. And, there is no inverse monotonic relation between the quantity of capital and the rate of profits. This is applicable both to the economic system as a whole and to the individual productive processes, and it is a proposition independent of the method chosen

for measurement of capital, whether in physical or in value terms. Notwithstanding the problems of aggregation, the main definitive result is that the equimarginal principle applicable to production in the form of the substitution of labour for capital could not be sustained as a generally valid proposition.

The attempt of the neoclassical economists to provide the classical theoretical framework with a consistent theory of value, that incorporated the Smithian notion of profits as the natural cost of capital determined in real terms, that is within the 'sphere of production' to use an ancient expression, failed in its production function version. The equally ancient theory of capital as a wage fund survived, but only in its monetary version, the cost of money, the cost of 'funds', is the interest rate. In the Ricardian short term, profits as a residual would be determined in real terms and the interest rate would gravitate towards the profit rate not the other way around, as Smith implied. For Marx, interest payments would come from profits as determined by his theory of surplus value, the distribution of the surplus between financial and industrial capitalists was a question of power. The long term implication of Ricardo's position would be a zero interest rate and zero profits. Which coincides with Frank Hahn's discovery that the nill value of money is an equilibrium solution. There is an equilibrium where the economy is effectively demonetized; it no longer appears to be a monetary economy. If we are not able to consistently demonstrate that there is something like a cost of capital, measured as the profit or interest rate, that is different and independent from the prices of the physical commodities used as capital, then the Smithian and the Ricardian long term equilibria are one and the same.

The general equilibrium approach initially developed by Walras is a generalization of the Smithian idea that prices of commodities and production factors, are determined by the particular demand and supply conditions prevailing in each market. What Walras demonstrates is that under certain conditions general equilibrium is possible, that is equilibrium prices for factors

and products, defined as prices that satisfy two conditions, markets clear and unit costs and prices are equal, can be determined simultaneously. In Walras initial formulation the level of absolute prices, that is money prices, is undetermined. All prices are relative prices measured in terms of an arbitrary physical unit, the *numéraire*. The Walrasian 'solution' to this problem was to introduce the demand for money as circulating money in all utility functions, as it is known in modern general equilibrium analysis this is not a satisfactory solution.

Walras originally assumed fixed technical coefficients of production but in later versions he adopted the general marginal productivity theory of distribution, postulating the proportionality of the marginal productivity of different factor services to their prices, this step was carried on in way that added the same number of equations and unknowns to the system so general equilibrium was maintained. Nevertheless, by adopting the marginal productivity theory of factor pricing, Walras implicitly rejected his long term condition that prices equal costs of production, because according to the marginal productivity theory postulates, factors are always remunerated at their cost, so prices always equal costs. So in strict terms, either the original Walrasian prices equal costs condition, or the marginal productivity theory, is redundant. Modern general equilibrium analysis does not rely on marginal productivity analysis, but on activity analysis, so both Walrasian classical equilibrium conditions markets clear and prices equal costs can be reinstated. Aggregate production function analysis adopts marginal productivity theory. The Walrasian long term equilibrium where markets clear and prices equal costs, corresponds to the Smithian/Ricardian long term. Monetary phenomena is irrelevant in this world and the Walrasian treatment of the demand for money is arbitrary.

In addition to his theory of prices, Walras introduced a theory of capital that is essentially different from the classical perspective on the valuation of capital. Walras made the value of capital a function of the profits on capital, an analytical step of tremendous theoretical consequences for the classical political

economy approach that conceived the value of capital on a cost or price basis and the profit rate as a simple result of dividing two independent magnitudes: profits and capital. Walras tried to analyze together for the first time, the simultaneous determination of the prices of commodities and of the prices of capital, depending on profits and as something different from a commodity. Walras posited that the prices of capital goods are rigidly proportional to their net yield at given interest rates, that is, the price of a capital good is equal to the net present value of its future returns discounted at a given rate. Walras' theoretical problem was the determination of the prices of capital goods considering as given the future profits derived from its use, which would be equal to the known net annual rentals and/or equal to their perpetual net yields, the question then was reduced to the determination of the appropriate discount rate. On this, Walras commented that he had looked in vain for the market where such rate was established. He settled for the interest rate. In the Walrasian long term equilibrium, residual profits would be zero, and prices will be equal to costs, á la Smith, and they would include the cost of the capital funds employed in production, that is the rate of interest. Of course, Walras was not aware of Hahn's argument that in the classical long term equilibrium the economy was demonetized.

Walras treated all capital goods as if they were *'consols,'* that is fixed rate perpetuities, reducing the problem of the determination of the value of capital, to that of the valuation of a perpetual known given yield, that is in modern terms, of a future equal perpetual cash flow. Walras initiated the custom of treating the demand for securities, as the demand of any other consumption good, and he did the same thing with the demand for money to hold. Walras' theory is a theory of the relative prices of commodities, and unless we think that capital and money are essentially the same as any other commodity, that is simple goods: 'cash goods', 'equity goods', 'debt goods', etc. Money and capital have no place in the Walrasian proposal. The fundamental contribution of Walras in this respect is that he recognized, in contrast with the classical approach, that the value of capital

was a function of future profits discounted at the proper rate, and that for the first time in economics he tried to determine the value of capital as defined, the interest and/or profit rate simultaneously within a general equilibrium approach. Walras did not achieve an integrated analysis of the commodities and the financial markets, he simply treated financial assets, including money, in the same way as any other goods. Nevertheless, there is a fundamental expansion of the domain of the classical theoretical system by Walras. This is the introduction of the problem of the determination of the value of capital from outside the system, based on its future returns and dependent on a discount rate. The moment we admit that the valuation of property rights on capital as a security, can be different from the cost or the price of the commodities used in production, a completely new set of economic problems emerges. From a Lakatosian perspective this classifies as a substantial increase in the empirical content of economics compared to classical political economy. There is an instance of rupture, yes, barely developed, with the traditional view of capital as a thing.

Irving Fisher developed the idea of capital as a fund of purchasing power whose value is determined by the present value of its discounted future returns. Á la Walras the value of capital depends only on its future returns, not considered as a given, but determined by the physical marginal productivity of each capital good in particular. Fisher postulated that, in general, there are as many own-rates of interest in an economy as there are products produced with the aid of capital goods, and only in a stationary equilibrium a single interest rate would coincide with the many different own-rates of return. Fisher also postulated that only through a general equilibrium approach this theoretical problem could be solved. In a competitive equilibrium the marginal physical product of capital will be equal to the annual money rental of a representative capital good divided by its price, the so-called 'real own-rate of interest' of the product in a one sector economy. Under conditions of perfect arbitrage and with a constant price level, this own rate, determined in real terms, will equal the money rate of interest. Á la

Ricardo monetary forces will affect the rate of profits, only temporarily at most, and in equilibrium the real rate of return will determine the money rate of interest. Without fully developing a general equilibrium multi-good model, Fisher postulated that only in a stationary equilibrium a single interest rate would coincide with the many different own-rates of return.

Modern general equilibrium analysis is an extension of Walras' and Fisher's contributions. The contemporary analysis of the existence, optimality and stability of general equilibrium in a free market competitive economy, were already considered by Walras. General equilibrium theory is concerned with the interactions of many individual agents in an economy. A competitive equilibrium in modern analysis is defined usually as the state of affairs in which: each consumer maximizes her satisfaction given her budget set defined by the prevailing price vector; each producer maximizes her profit given the same price vector; and, the total supply of commodities is equal to the total demand for commodities, or Say's Law. This last equilibrium condition is known in the modern literature as Walras' Law: "supplies equal demands: markets clear." The second classical and Walrasian long term equilibrium condition that prices equal costs, zero profits, is often subsumed acritically to the first. The existence of 'equilibrium' depends on whether or not there is a price vector that can sustain the above described state of affairs. The classical questions of general equilibrium analysis, or welfare economics, are whether every competitive equilibrium realizes a Pareto optimum, that is a situation where no agent can increase her satisfaction without decreasing someone else's, and whether a Pareto optimal state can be achieved and supported by a competitive equilibrium. Starting with Arrow and Debreu seminal contributions, other modern authors have simplified and perfected these expositions demonstrating that under certain conditions a competitive equilibrium will realize a Pareto optimum and that a Pareto optimum can be achieved and is supported by a competitive equilibrium. General equilibrium analysis has shown that pure free markets can be an extremely efficient way of allocating resources and organizing economic

activity, within a set of perfectly defined conditions and within a given institutional framework: the ideal Smithian end state is theoretically possible. Nevertheless, as Jaffé correctly pointed out, the economies portrayed in general equilibrium analysis are not modern capitalist economies. General equilibrium models do not show *how* a capitalist system works, but how an imaginary free market system *might* work in conformity with certain principles.

A crucial point in these models is that *current prices are present discounted values of dated goods.* In the spirit of the Fisherian analysis, each dated good's future price is discounted by its own-rate of interest, which in the model is directly derived from the prices of the same commodity between two dates, own-rates of return or interest for different commodities are not equal. Given that current and future prices are determined by spot and future markets, these last identical in A&D, the so-called own-rates of interest, which are nothing more than the per-cent relationship between these two prices of the same dated good, are of very little or nil theoretical interest, i.e. agents do not react to them. Of course, when someone says lightly that *the* profit rate or *the* interest rate problem, is solved in general equilibrium through the use of dated commodities, it is evident that has problems understanding both.

The classical theoretical system, among other problems, lacked a consistent theory of value, the general equilibrium approach initiated by Walras and eventually perfected by the contributions of Arrow, Debreu and Hahn, among other modern theorists, filled this gap. Now the theoretical problem of the determination of the relative prices of commodities irrespective of their use, under conditions of a pure free market equilibrium, can be considered as solved at least for the long term scenario. The modern general equilibrium approach to value theory does not require a marginal productivity theory and does not depend on the use of micro or aggregated production functions. The latter two, a theory and an approach inextricably linked, whose validity was terminally questioned during the capital controversies. If we take seriously the generally accepted

conclusions of this debate, where the best and brightest economists from the main currents of contemporary economic thought participated, profits cannot be considered as a cost or as a payment for the marginal productivity of a physical entity called capital, the rate of profits cannot be simply assimilated to the interest rate or viceversa. The frequent practice in general equilibrium analysis to consider profits as 'frozen' payments to firm 'specific' resources that are not traded as every other commodity is, constitutes an arbitrary assumption. Such a general equilibrium solution, that determines all prices of commodities, plus positive profits as 'frozen' payments to firm 'specific' resources, can be accepted as most as a temporary equilibrium where markets clear but prices differ from costs, so in strictly classical terms profits can appear as a short term residual only.

Regarding capital, its value cannot be determined simply by the aggregation of the prices of its constitutive parts; not as a production cost inclusive of interest á la Smith; it cannot be determined by its given yields discounted by the interest rate, á la Walras; it is not determined by the physical marginal productivity of capital goods. The value of capital is determined by the future residual profits or returns, that a particular firm or activity can yield. Capital is the tradeable property right on these profits, it is not a thing, it is an entitlement. The value of capital is distinct from the value of the commodities that are used to generate profits, and the mechanisms to determine the prices of commodities, general equilibrium conditions, and the prices of capital, present value of future discounted profits, are essentially different as well. Of course, from a scientific perspective they need to be integrated in the same theoretical system, and determined simultaneously. If capital depends on profits and profits are not a cost, then profits as a residual can only emerge in conditions different from the Smithian, Ricardian and Walrasian long term full equilibrium. So we need a theory to explain how can levels of wealth or output, that are different from full equilibrium can be achieved. If we can determine present and future residual profits, then to determine the present value of capital we need an

appropriate discount rate, here we either assume a zero present value of capital and determine an internal rate of return, or we can use the interest rate as determined in financial markets as the appropriate discount rate to determine the value of capital. Given that capital is essentially a fiduciary phenomenon we need an integrated theory of commodities and financial markets. The problems of money, the interest rate, capital and financial markets in general, cannot be dealt with solely from inside value theory, the consideration of exogeneous structures is required. This conclusion is shared by general equilibrium theorists like Starr, among others, and by Sraffa and followers, and it is a conclusion that should not surprise anybody: every logical system is incomplete, to consider otherwise is to pursue Hilbert's programme in economics. John Maynard Keynes was the first economist to visualize the need of a general theory to deal with some of these problems.[184] Problems that can derived directly from the deductive structure of the classical theoretical system we have reconstructed.

The classical theoretical system lacks a theory for the determination of wealth at levels different from a Smithian ideal long-term equilibrium, or to use a modern expression different from 'full employment.' Walrasian general equilibrium and production function analyses share this characteristic. Here we either consider this a non-problem and assume that the economy is always more or less around this ideal level, save for random shocks, well intentioned government policies that cause more harm than good, workers that decide not to work more out of their own volition, or similar causes that can push the economy away from its natural position and path of growth. Which is the stance of the so called New Classical economists or third generation monetarists. Or, if we consider that the determination of the level of output at different levels than the Smithian ideal end-point is a real theoretical and practical problem, then an alternative theory is required. Such a theory would require, either: The rejection

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[184] "Thus the analysis of the Propensity to Consume, and the definition of the Marginal Efficiency of Capital and the theory of the Rate of Interest are the three main gaps in our existing knowledge which it will be necessary to fill. When this has been accomplished, we shall find that the Theory of Prices falls into its proper place as a matter which is subsidiary to our general theory." Keynes, J. M., "The General Theory" Pp. 32.

of Say's Law, and with it, implicitly or explicitly, the associated free market mechanism and to present an alternative theory of wealth determination and of competitive markets. Or as Clower expressed it would require an 'alternative theory of household behavior.' This line of thought is at the center of the Keynesian research programme: Say's Law is rejected and the principle of effective demand is the proposed alternative.

The other option, which is the path I will follow in my research programme, would be to develop a theory that integrates Say's Law and the workings of competitive markets, in a wider framework that admits a continuum of general equilibrium positions, where the Smithian ideal end point is just one of them. Such a general equilibrium approach would require the adoption of the two classical equilibrium conditions, in the short and in the long term: Say's/Walras' Law, and, in the long term only: prices equal costs. This will allow us to consider profits as a residual determined in real terms, as a temporary general equilibrium phenomenon; to find a way to determine the economy's general rate of profit; then to study the problem of the determination of the value of capital and its variations, establishing the way the profit rate interacts with the interest rate as determined by real and monetary forces, and how the dynamics of capital affect the short and long term dynamics of the economic system, in particular cycles and financial crises. This alternative option would concentrate in the core problems of the classical theoretical system that are still relevant for contemporary economics, and in the study of the complex dynamic processes whereby, real world economies, converge or not, either in a stable or in an unstable manner, towards a long term equilibrium where the optimal results of free markets can be realized. A 'classical' study of these processes would concentrate the analysis in the generation of profits, the profitability of capital and in its long term trend. A true contemporary 'classical' approach would also integrate fully the monetary and financial forces at play. These are the questions I am working on my current research programme. These are, at least from the

short term perspective, some of the questions that Keynes' analytical proposal is about.

Keynes' work was a frontal attack on what he called "classical theory" and it was intended to be a 'struggle of escape from habitual modes of thought and expression'. For Keynes the classics included David Ricardo, James Mill, J. S. Mill, Marshall, Edgeworth and Prof. Pigou, among others. It has become a commonplace idea that Keynes' aggregation of such a wide number of scholars under a single heading was, at least, an oversimplification, that the 'classical economist' is a straw man, no single pre-Keynesian writer or group of writers, personified classical theory. But it would be very difficult to deny that overall, the contributions of the founders of political economy or economics as a scientific discipline, have a common domain, a deductive structure constitutive of a relatively well defined theoretical system, a set of common problems to be elucidated, among other elements, that can be termed as 'classical.' I have argued in this essay for such a type of rational reconstruction, with the ultimate purpose to help us progress in our field. In other words, the rational reconstruction of the deductive structure of a scientific discipline should ultimately serve as a tool for the growth of knowledge. The rational reconstruction of the theoretical system of classical economics we have presented allowed us to conclude directly that a theory for the short term determination of wealth or output was needed, that this theory required a consistent theory of profits and capital, and a different but consistent theory of money and the interest rate. So I would say that Keynes' straw man, more than a convenient rethorical tool, is a 'rational reconstruction' of the thought of his favorite 'classical' writers.

What Keynes defines as classical economics includes: David Ricardo's idea that there is no such thing as aggregate demand defficiencies, against Malthus attempts to develop a rationale for them; classical price theory based on marginal utility and productivity analysis; and, Pigou's employment theory that advocates the ever present tendency towards full employment. From my

perspective, I would say that, Keynes criticized the views that believed the economy was always in or near the Smithian long term equilibrium; that prices were always equal to costs thanks to the generalization of Ricardo's rent theory into the marginal productivity of factors theory; that the profit rate was equivalent to the interest rate; that monetary and financial forces did not matter and that the aggregate impact of capital markets could be disregarded. What Keynes termed as classical theory was for him clearly inadequate to deal with the real short term problems of modern capitalist economies.

Keynes' critique of involved two main issues: First, the validity of the traditional analysis of the labor market where workers would react to and negotiate their wages in real terms only. Keynes stressed that workers would negotiate money wages but that real wages and total employment would be determined by aggregate forces mainly. Second, Keynes proposed to demonstrate that Say's Law of Markets, was a particular not a general situation of aggregate equilibrium. Say's Law, could be integrated as a special case of the more general systemic principle of Effective Demand. Say's Law would determine total output and employment only at the full employment equilibrium point. The Effective Demand Principle would determine equilibrium in a continuum of points before equilibrium, the characteristic fluctuations of modern capitalist economies, could be traced back to fluctuations in effective demand. Monetary forces and financial markets would play a central role in the analysis. More than on an apparent "money illusion" on the part of workers, relevant for the consideration of the adjustment process of wages and prices, Keynes' analysis relied on the interaction of the interest rate and the profitability of capital, what he termed the marginal efficiency of capital, interaction that would determine the level of investment, employment and aggregate demand. This interaction could, in Keynes' vision, generate significant positive wealth or windfall effects, which may impact the macro dynamics of the economy. The theoretical debate before Keynes, according to Wicksell, had three main issues pending: capital and interest, monetary dynamics and population. In particular, the issues of capital

and interest, where far from settled theoretical issues. Keynes did not try to solve these issues for their own sake, however, in his short term aggregate analysis of the fluctuations of output and employment in a modern capitalist economy, the fundamental variables are the relative prices of labor/wages, capital assets/profits, and money/interest.

Keynes questioned the validity of Say's Law, the systemic classical postulate. For Keynes, Say's Law coupled with the notion that prices would adjust immediately to costs as determined by classical price theory, meant that the existence of involuntary unemployment was impossible and therefore a strict adherence to Say's Law made it impossible to understand the causes and possible remedies to depressions and widespread unemployment. The world described by the classics constituted a special case of general equilibrium: full employment equilibrium. The Keynesian alternative was the principle of effective demand. The explanation of the behavior of modern capitalist economies required to supplement the classic theory of value—for Keynes the Smithian inspired Marshallian version—with the study of the dynamics of consumption, the profitability of capital, and of the determination of the interest rate in financial markets, as determinants of the level of investment and hence of aggregate effective demand. The latter as different markets whose analysis could not be simply carried on in terms of classical price theory. In other words, capital and money could not be treated as commodities.

A truly general theory of modern capitalist economies requires a different but integrated treatment of the markets for produced commodities and for financial assets. The pricing mechanisms in each case are essentially different but both markets are interrelated. Unfortunately, the fact that Keynes did not deal with the pending theoretical questions of profits, capital and interest in a systematic way, and tended to use the above mentioned variables with different definitions depending the problem he was dealing with, is, to an important extent, the origin of so much confusion about Keynes' contributions to the theory and

practice of economics. Particularly confusing are Keynes' analyses of capital. What Axel Leijonhufvud calls, Keynes's habit of lumping together under the heading of non-money assets every possible form of value storage, is certainly one of, if not, the major weaknesses of Keynes' aggregative structure. Of course Keynes is not alone in this respect, up to this date capital theory is plagued by confusion. Quoting Keynes on capital theory: *"There is, as I have said above, a remarkable lack of any clear account of the matter."*

For Keynes, in general, wealth effects are positive and significant.[185] In standard neoclassical theorizing, wealth or capital effects, are non existing. For Hicks they are most likely neutral and of little significance, for F.H. Knight they are: "...largely a fiction and a delusion." Nevertheless, if we consider Keynes long term assets' as capital, that is as a property right on future residual profits, then we may be able determine consistently, the existence of significant wealth or capital effects at the macrolevel due to changes in the interest rate and/or the general profitability of investment, and in the financial structure of the economy. That is, we may be able determine the existence of fluctuations in the value of capital, that can generate divergences between aggregate demand and supply, that is, effects that may cause the breakdown of Says' Law. Something that Keynes indicated as a possibility but did not develop.

All in all, Keynes and some of his followers' attack on Say's Law has proven unsuccesfull, turning the 'market clearing' postulate into the central tenet of standard economics. What Keynes failed to do, was to recognize that Say's Law, as a short and as a long term equilibrium condition, only implies full employment when coupled with the second classical and Walrasian long term condition that prices equal costs. Also what Keynes failed to fully recognize is that the classical price theory—Marshallian marginal productivity based—, that he somewhat reluctantly accepted, implied logically both long and short term

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[185] Keynes had a contradictory view in this matter he wrote "A country is no richer" when the general level of securities prices goes up without any change in objective transformation possibilities, "but the citizens, beyond doubt, *feel* richer." See Leijonhufvud, A. Pp. 266.

equilibrium conditions and hence full employment. What Keynes' critics from the neoclassical perspective did, was to reassert classical Marshallian price theory and deny that workers suffered from 'money illusion' when they negotiate their salaries. By doing so, the first element of the Keynesian critique was gone, except when nominal wages are rigid by assumption, an obvious special case of unemployment. Then they collapsed the interest rate and the profit rate, the marginal efficiency of capital, into the interest rate only, as the price that would guarantee the equality of savings and investment, and with it Say's Law. The rejection of any type of wealth or capital effects, not sufficiently established by Keynes, eliminated the speculative motive in the demand for money and permitted to conclude that the vagaries of the financial markets and the financial structure of the economy could be safely put aside. Only in the extreme situation of the liquidity trap, another special case, the economy could be 'trapped' in unemployment. Keynes' general theory became the special case. From my perspective, the problem is not wether or not Say's Law is valid. It is valid. The problem lies in a particular conceptualization of price formation and output generation in competitive market conditions. What should be rejected is the Smithian inspired classical price theory where profits are a cost, something Keynes never did.

Notwithstanding, the general direction of Keynes' theoretical research was, in my opinion, correct: the ideal long-term of the classics did not correspond to the realities of our world; we need a theory to explain the actual short term aggregate movements of real life economies, that seldom, if ever, are in the ideal end-type situation portrayed by Smith or in the Walrasian world. To understand the dynamics of a modern capitalist economy we need to elucidate the relationships between the rate of profits, the rate of interest and capital accumulation, an integrated account of financial markets and commodities markets is essential. In the short term markets clear, but this is a temporary equilibrium that does not correspond to full employment equilibrium and does not have optimal properties. Only when prices are equal to costs then the Smithian

and Walrasian long term results entail. The existence of temporary positive residual profits, the variability on the profitability of capital that can result from a succession of temporary equilibria, the accumulation of capital as tradeable property rights with a potentially high fluctuating value, dependent on future residual profits, are phenomena, that can affect the demand for money and that can generate effects that alter Says' Law in one way or another. Keynes derided Ricardo's domination of English economics for more than a century, nevertheless he developed solutions for some of the original problems that Ricardo assumed: the short term determination of total demand and output, the determination of real wages, and in the spirit of the classics he did so from the perspective of the profitability of capital, as different from the interest rate. Which is what that obscure member of the underworld, Marx, did as well. From the perspective of the theoretical system of classical political economy, the Keynesian proposal seems more classic than the classical theory Keynes was struggling against.

It is now a commonplace observation that what Keynes did, was to provide for the first time in the history of economics an integrated analysis of commodities and financial markets. Contemporaneous macroeconomics presents an integrated analysis of real and financial markets in the "Neoclassical Synthesis" or the IS-LM, framework. IS stands for the equality between savings and investment, which implies Walras' Law. LM stands for the equality of the demand and supply of money as the equilibrium condition for the financial markets. L, stands for the liquidity preference or demand for money, and M, for the money supply. Variations in the interest rate and in aggregate output or income will assure the equality of demand and supply on both the commodities and the financial markets. If these two curves, IS-LM, are superimposed they will intersect at the point where there is a simultaneous equilibrium of the commodities and the financial market. There is only one possible combination of the interest rate and the level of income that will guarantee the simultaneous equilibrium in both markets. In this world Keynes' "unemployment equilibrium" is a logical impossibility, unemployment is a temporary disequilibrium phenomenom.

Keynes' analysis and contemporaneous derivations, hinges around the question of the role of monetary and financial forces, vis á vis, real forces. Within the classical theoretical system, the analysis was carried on strictly real terms, nevertheless for the classicals the consideration of the profitability of capital was essential. In Walrasian general equilibrium, money is simply a numéraire. A more contemporary 'real' view is that of Friedman's monetary analysis: " *money 'does not matter'.* " Following on Friedman's steps, the New Classical Economists adopt a quite radical money does not matter view: the neutrality of money proposition(s). What is common to contemporary 'real analysts' is the general presumption that money does not matter very much and the treatment of money and securities as if they were goods, that are part of the agent's utility functions and are "consummed." For the New Classical economists, the most important aspects of the economic world can be analyzed without references to monetary or financial forces, except as exogeneous shocks.

The neoclassical synthesis seems to fill some of the crucial gaps within the classical theoretical system: a short term theory of the determination of total income and output, an explicit link with monetary forces, through the real balances theory the demand for money is 'explained' and a mechanism that will propel the economy out of a situation of different from full employment is proposed. Nevertheless the IS-LM approach eliminates the problem of profits and the profitability of capital and it equates the savings of households with the profits of firms. Households, can decide how much of their income they are going to consume and how much they are going to invest. Firms, cannot decide how much money they are going make. In the original Keynesian thought, profits would determine investment, investment, income and given the propensity to consume, savings would be determined, being by definition equal to investment. The interest rate established a lower limit to investment, only projects with returns over and above 'the' interest rate, would be undertaken. The IS-LM perspective, subsumes the rate of profits to the interest rate on funds, when it

was Keynes' intention to clearly separate the Marginal Efficiency of Capital from the Interest Rate, and to study the way changes in the valuation of capital, including debt and equity, could affect financial and commodity markets through capital effects. Keynes believed that financial markets could generate significant systemic disturbances that could keep economies away from full employment for significant periods of time. Keynes tought that investment markets were not playing the fundamental role they should and that the existence of highly organized markets could even prove to be destabilizing.

In standard macroeconomics teachings, financial markets are limited to the neoclassic LM, perspective of money and one financial asset, a fixed interest government bond, and one price, the interest rate. Other financial markets, i.e. private debt and equity, are treated as "extensions." In this vision capital markets have an insignificant, if any, impact on the short and in the long term functioning of the economy, capital effects are an 'insignificant illusion.' The integration of the classical quantity theory of money through the real balances effect is far from satisfactory, in the last analysis the positivity of the price of money and hence the demand for money cannot be explained by the real balances theory, it depends on exogenous structures: the state and the demand for money derived from taxes payable in money. The significance that Keynes adscribed to monetary and financial markets dynamics is severely diluted in the IS-LM framework.

Until the 1970s there was something of a centrist consensus regarding macroeconomics, built around the neoclassical synthesis. The synthesis and related themes were intensely debated from the post-Keynesian, Marxist and Monetarist camps. Nevertheless, the centrist moderate conclusions of the IS-LM 'Keynesians' held their ground as a practical guide for economic policy. The rational expectations hypothesis introduced by the New Classicals radically changed these conclusions, they contended that the predictions of the neoclassical synthesis, 'Keynesian economics,' were abolutely incorrect and that the doctrine that supported them failed. The behavior of people is strongly

affected by their expectations about future events and they form these expectations in a rational way. The Lucas critique showed that the existing econometric models at the time used to simulate changes in economic policy were flawed. The consideration of rational expectations would necessarily introduce changes in people's response to policies, so the old models were not appropriate. The introduction of rational expectations in Keynesian type models, resulted in fluctuations away from the 'natural' level of output that were significantly shorter and less pronounced. The aggregate supply function was revised through the introduction of the labor markets. Keynesian models relied on a slow adjustment of prices and wages, under rational expectations there was no reason why the adjustment of wages and prices should be slow, only unexpected variations in the price level would have real effects. Finally, these scholars argued that the proper instrument to deal with these problems was game theory, and that every economic model should be based on strictly rational individual behavior. In short, Keynesian synthesis models could not be used to formulate economic policy, they could not explain fluctuations in aggregate economic activity and monetary/financial forces would not matter. Policies intended to stabilize could be de-stabilizing and that fixed rule policies were better than discretionary ones. They concluded that employment and production, usually hovered at its 'natural' level determined strictly in real terms as Keynes' classics. Not a necessary conclusion of the classical theoretical system, where the issue of the short term determination of output and employment and its fluctuations was an open question.

In the New Classical perspective, fluctuations in employment and output, are variations of the natural level *not deviations* from it. So if there are fluctuations is because the economy is moving from one situation of competitive equilibrium to another, and these fluctuations can only be explained in terms of autonomous changes in general equilibrium conditions, preferences, technology, endowments, etc. Within this general perspective, for the Real Business Cycles, RBC, theorists the main force behind fluctuations is technology. Their analyses

are based on highly simplified competitive models with a single good produced by labor and capital with a constant returns technology, and where the only shocks to the system are exogenous stochastic shifts in the production technology. The logical consequence of this view is that the classical difference between the short term and the long term is eliminated. The moderate IS-LM type conclusions are completely rejected and the more radical original approach of the General theory as well as the fundamental conclusions from the capital controversies are not even considered. For the New Classicals economics is reduced to the endless development of the neoclassical aggregate production function approach to growth theory, but *with* microfoundations. Growth theory has traditionally been studied as part of macroeconomics, focusing on the undisturbed evolution of potential output, or of the level of production at normal capacity utilization. The fundamental **assumption** is that the goods and labor markets clear, that is, labor and capital are always fully or normally employed or that the employment level does not vary, the prices equal costs condition is implicitly assumed as well. Growth theory uses mostly completely aggregated one-sector models, usually a single good is produced by capital and labour and all consumers are assumed to be infinitely-lived and identical, which is exactly the same as positing a single agent. What Solow calls the 'ultra-strong neoclassical assumption' that the economy traces out the intertemporal utility-maximizing program for a single immortal representative consumer or of a number of identical such consumers. This is the old idea of the economy as a giant farm, but now managed by a single immortal representative farmer, this individual is an utility maximizer, so the theory is supposed to be solidly grounded on individual maximizing behavior. The theory now is said to have microfoundations and given that the economy is considered to be the sum of the individuals, it is the correct way, for some the only way, to study economic problems with the model of a single aggregated good with a single utility maximizing individual and with the use of dynamic games theory.

These models are supposed to be general equilibrium competitive models, however they are simple aggregate production function models, plus the representative consumer, where "general equilibrium" defined as market clearing with full employment of labour and capital, is an initial assumption. The explicit and the implicit equilibrium conceptualization of the New Classicals' view, is clearly at odds with the Walrasian treatment of the conditions and consequences of economic progress. Walras visualizes equilibrium as the continuous process of chasing a moving target without ever reaching it. For Walras different adjustment processes operate at different speeds: market clearing and can be determined in a matter of minutes. In contrast, the achievement of "full" equilibrium, is a considerably longer and slower adjustment process and in this process the evolution of profits and the role of the financial system and markets are central. Walras view of the reality of a modern capitalist economy is that of a continuous equilibrium, where the economy is always in a temporary equilibrium and this is different from day to day, moment to moment. In such a temporary equilibrium, markets can clear, but resources are not necessarily fully employed, output is not necessarily at its maximum level, money and financial markets matter, and all the good things that correspond to the ideal Smithian end state do not entail.

The original developments of growth theory were concerned with the long term hypothetical sate of an economy growing while at full employment, a situation where Walras' Law and the prices equal costs conditions apply. This original moderate view of the founders has been challenged: the single good-single agent theoretical models, can be used to account for short term phenomena. It can explain not only the secular growth trends of advanced economies but also it could explain business cycles, depressions, for example *the Great Depression,* and basically every other economic problem. It became in the words full of hope of Robert Lucas: *"the only 'engine for the discovery of truth' that we have in economics."* The founder of the RBC school, Prescott, argued recently that the great depression can be explained with growth theory supplemented with the labor/leisure decision, and concluded that for some

reason: *"the unintended consequence of labor market institutions and industrial policies designed to improve the performance of the economy"* workers decided to increase their leisure during the Great Depression. After more than twenty years of trying to find without success what technological shocks could have caused the Great Depression, using *"the only 'engine for the discovery of truth' that we have in economics"* only changes in the 'labour input' could 'explain' it. Prescott's argument is an implicit recognition of the incapacity of this approach to explain such an important phenomenon.

An alternative view from the New Classical economists, is found in the proponents of what is also called the New Keynesian economics. In general they accept the integration of rational expectations to macroeconomics, the consequences of the Lucas critique on econometric models, and more or less the integration of the labor markets to the IS-LM framework and the aggregate supply and demand model of modern macroeconomics. However, they stress the existence of market imperfections and market failures, and the implications of these problems for the evolution of the economy. At the policy formulation level and obviously in political views, there are extreme discrepancies between these two major contemporary currents in economic thought. Among the issues debated are the length of the period of adjustment of prices and wages, that is the analysis of nominal rigidities, and the character of fluctuations. It is recognized by everybody that exogenous variations in the aggregate demand, consumers' confidence, fiscal deficit, trade deficit or changes in the money supply, among other forces, affect in the short term the level of real output, nevertheless it is also recognized that in the medium term it will tend to its natural level. New Classical economists will say that the short term is very short, that the economy is always on or very close to a competitive equilibrium. The room for active economic policies is minimum and developmental advice is reduced to waiting. The more radical New Keynesians will say that the short term can be very long, that the effects of aggregate demand variations can be very long and persistent and very significant deviations in output from its natural level can be

caused by market failures. For these scholars, there is ample room for activist economic policies. What these contemporary views also share is a severely limited view of financial markets, in particular capital markets. There are, however, alternative views on capital markets (For example, Stiglitz and Grunwald) that have provided considerable insight on the dynamic interaction of real and financial forces, among other important but partial contributions. Nevertheless, the more radical original Keynes' analytical proposal regarding the need for a general theory to deal with the short term fluctuations of employment and output, incorporating in a consistent way the theory of value, has not been accomplished. In Keynes' vision such a theory would rely on the interaction of real and financial forces in the amplest sense.

In terms of our analysis, the theoretical system of classical economics needs to be completed with the integration, in an essential way, of the financial dimension characteristic of modern capitalist economies. To understand the dynamics of a modern capitalist economy we need to elucidate the relationships between the rate of profits, the rate of interest and capital accumulation. An integrated account of financial markets and commodities markets is essential, both sides of the balance sheet of an economy need to be analyzed, the financial structure of an economy matters. In the short term markets clear, but this is a temporary equilibrium that does not correspond to full employment equilibrium and does not have optimal properties. Only when prices are equal to costs then the Smithian and Walrasian long term results entail. The existence of temporary positive residual profits, the variability on the profitability of capital that can result from a succession of temporary equilibria, the accumulation of capital as tradeable property rights with a potentially high fluctuating value, dependent on future residual profits and on variations of the interest rate, are phenomena that can affect the demand for money, rendering it highly unstable and that can generate effects that alter Says' Law in one way or another.

The research programme that I will follow, would be to develop a theory that integrates Say's Law and the workings of competitive markets, in a wider framework that admits a continuum of general equilibrium temporary positions, where the Smithian ideal end point is just one of them. My perspective would be based on the individual rational actions of consumers and firms, but also would recognize that rational human actions can have unintended consequences, that is systemic effects that cannot be reduced to the behavior of a single agent, representative or not. Such a general equilibrium approach would require the adoption of the two classical equilibrium conditions, in the short and in the long term: Say's/Walras' Law, and, in the long term only: prices equal costs. This will allow us to consider profits as a residual determined in real terms, as a temporary general equilibrium phenomenon; to find a way to determine the economy's general rate of profit; then to study the problem of the determination of the value of capital and its variations, establishing the way the profit rate interacts with the interest rate considering real and monetary forces, and considering how the dynamics of capital affect the short and long term dynamics of the economic system, in particular cycles and financial crises. This alternative option would concentrate in the core problems of the classical theoretical system that are still relevant for contemporary economics, and in the study of the complex dynamic processes whereby, real world economies, converge or not, either in a stable or in an unstable manner, towards a long term equilibrium where the optimal results of free markets can be realized. A 'classical' study of these processes would concentrate the analysis in the generation of profits, the profitability of capital and in its long term trend. A true contemporary 'classical' approach to the study of modern capitalist economies, would also integrate fully the monetary and financial forces at play, recognizing that financial forces can have real effects and that these can be negative, severe and long lasting. The central problem is not, wether or not modern capitalist economies are inherently unstable, as Karl Marx and George Soros, believe, or inherently stable, as Prescott and Lucas have argued, the problem is to understand the conditions

where significant instabilities can emerge endogenously so that they can be avoided.

The end.