

## Contributions to economic theory and the relevance of Mrs. Joan Robinson

### Los aportes a la teoría económica y la vigencia de la señora Joan Robinson

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#### Abstract

Three important dates in the life of one of the most prominent Post-keynesian economists were commemorated in 2013, the 110th celebration of her birthday (October the 31st, 1903), 80 years since her masterpiece *The Economics of Imperfect Competition* (1933) was published and her death 30th anniversary (August the 5th, 1983). Mrs. Joan Robinson made great contributions to economic theory from a heterodox perspective, and with a wide social content. She was characterized by her interest in expanding the main macroeconomic issues to the problems of economic development and by a strong microfoundation towards imperfect competition market structures. This author bases her analyses in a significant amount of tools and interdisciplinary links, which may explain why her works are provided by deepness and analytical rigor in the history of economic thought. Robinson was concerned on debates about teaching of economics and the Neoclassical model.

#### Resumen

En 2013 se conmemoraron tres fechas importantes en la vida de una de las economistas poskeynesianas más destacadas, la celebración del 110° aniversario de su nacimiento (31 de octubre de 1903), los 80 años de la publicación de su obra maestra *The Economics of Imperfect Competition* (1933) y el 30° aniversario de su muerte (5 de agosto de 1983). Joan Robinson realizó grandes aportaciones a la teoría económica desde una perspectiva heterodoxa y de amplio contenido social. Se caracterizó por su interés en ampliar las principales cuestiones macroeconómicas a los problemas del desarrollo económico y por una fuerte microfundamentación hacia las estructuras de mercado de competencia imperfecta. Esta autora basa sus análisis en una importante cantidad de herramientas y vínculos interdisciplinarios, lo que puede explicar que sus obras estén dotadas de profundidad y rigor analítico en la historia del pensamiento económico. Robinson se preocupó por los debates sobre la enseñanza de la economía y el modelo neoclásico.

**Economic development, Market, Neoclassical model**

**Desarrollo económico, Mercado, Modelo neoclásico**

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## Introduction

"The purpose of studying economics is... to learn how to avoid being fooled by economists". Joan Robinson

This article aims to highlight the contributions of Joan Robinson to economic theory, not only in terms of her vision of the economic world, but also in terms of her methodological contributions, by generating a prolific economic literature characterised by a heterodox perspective with a broad social content, which handles the main macroeconomic concerns with an extension to the problems of economic development, supported by a strong micro-foundation based on the structures of economic structures.

The author bases her analysis on a significant number of interdisciplinary tools and similes, which explains why her works have been classified as the most profound and analytically rigorous in the history of economic thought. All this characterisation of Mrs. Robinson's production, later in her life, would be reflected in her constant concern for the teaching of economics and for relentlessly combating the theoretical scaffolding of the Neoclassical school.

Mrs. Robinson's name was Joan Violet Maurice, born on 31 October 1903 in Camberley, a small town in Surrey, thirty miles from London; her parents were Sir Frederick Barton Maurice and Lady Margarite. His great-grandfather, Frederick Denison Maurice, belonged to Christian Socialism, which had been concerned with issues of pauperism in the mid-19th century, for whom he is credited with his social concerns and his courageous attitudes in controversies with his opponents in debates on economic theory.

At the end of her early schooling at St. Paul's, Mrs. Robinson decided to study economics at Girton College, Cambridge. After completing her studies in economics at the age of twenty-two, she married Edward Austin Gossage Robinson, twenty-eight, also from Surrey and an economist, with whom she had two daughters Ann (1934) and Barbara (1937); she moved to India in 1926 where Austin had been engaged as tutor to the Maharaja of Gwailor.

There, for three years, Mrs Robinson gained her first real insight into economic underdevelopment and poverty, problems she would work on throughout her life in economics (Perez, 2010).

On returning to Cambridge in 1929, Joan Robinson worked as a tutor, supervising undergraduate students, while also beginning her research activities. By this time John Maynard Keynes was the editor of the Economic Journal and had brought to Cambridge the young economists Piero Sraffa and Richard Kahn, who were important in Joan Robinson's life.

In 1931 Keynes set up a group called the Cambridge Circus, made up of what were considered to be the most brilliant young economists of the day: Sraffa, Kahn, James Meade and Joan Robinson herself. In the same year, Robinson became an assistant professor, in 1937 an associate professor and in 1949 a full professor. Until 1965, she held the position of Professor at Girton University, a position she held until 1971. In 1979 she was the first woman to be awarded a Fellowship at King's College, and just four years later, on 5 August 1983, she died in Cambridge (Perez, 2010).

At a memorial service for Mrs Robinson held in King's College Chapel (29 October 1983), Ruth Cohen (a lifelong friend and Principal of Newnham College), said of Mrs Robinson: "Her work was original in many fields and her reputation as a leading economist has been known throughout the world for many decades. I think most of us would consider it outrageous that she was not awarded the Nobel Prize.... As an economist he accepted no theory as dogma and reconsidered accepted assumptions, those of the right of course, but also those of the left.... In the last years of her life she felt very depressed about the state of economic doctrine and struggled for a theory that would create models capable of taking into account history, ecological balances in individual communities and in particular technological change. He was trying to work out a different technique of thinking". (Feiwei, 1988) (1932), "A Parable on Savings and Investment" (*Economica*, 1933); "The Theory of Money and Analysis of output" (*Review of Economic Studies*, 1933); "What is perfect competition?" (*Quarterly Journal of Economics*, 1934) and "Euler's Theorem and the Problem of Distribution" (*Economic Journal*, 1934).

In 1933 he would also publish *Economics of Imperfect Competition*, his most successful work (For a broader view of Joan Robinson's work, see Annex No.2 of this document).

From 1936 onwards she began to write for the dissemination of Keynesian ideas, which remained with her throughout her life and constituted an important bulwark against attempts to absorb them into the main body of neoclassical orthodoxy, but she would not carry out such adherence uncritically, and indeed she did not even consider the Keynesian revolution to have been a great intellectual triumph.

Although it must be acknowledged that Mrs Robinson clearly established the differences between Keynes's original approaches and those of the Neoclassical Synthesis, whose representatives she called "bastard Keynesians". For example, when Keynes argued that a reduction in nominal wages would produce, in each of the independent variables of his interpretation of the economic system, adverse effects on the marginal propensity to consume, and on the marginal efficiency of capital and favourable, downward, effects on the rate of interest, Joan Robinson brings something important to bear on the issue: "the orthodox theory, which Keynes attacked, held that a reduction in money wage rates implied a reduction in real wages, and that a reduction in real wages would lead to an increase in employment. Keynes' argument was very different from the one that has since been inadequately elaborated by Keynesian bastards; for, according to them, money wage rates are rigid for institutional reasons.

Keynes' argument was based on the fact that, if during a depression wages were reduced, the situation would worsen because this would lead to a fall in prices and expectations of subsequent falls which would discourage investment; on the other hand, the fall in the monetary value of shares would reduce the availability of credit and put banks in danger of bankruptcy" (ROBINSON, *Economic Heresies*, 1976).

Joan Robinson read Marx with some interest but with a critical attitude and in 1942 published *Essay on Marxian Economics*, where she tried to rescue the purely economic and conceptual aspects of his work, endeavouring to show how the models of Marx and Keynes rest on the same basis, tracing in the models of imperfect competition a theory of distribution very similar to the Marxist one, defining herself as the "quintessential left Keynesian" (DE LA IGLESIA, 2007), integrating in her work elements taken from Keynes, Marx and Kalecki (who for her had put forward a more coherent version of the General Theory, by introducing imperfect competition into the analysis, thus constituting "a more authentic general theory than Keynes". From then on his main interest was to create a theory appropriate to the analysis of a dynamic economic problem. His contributions to the theory of capital and economic growth in the 1950s and 1960s were widely recognised. In *The Accumulation of Capital*, 1956, she attempted to extend Keynesian analysis to the long run.

Mrs Robinson can be considered as the antithesis of epistemological dogmatism, her method consisted of using theories to learn and explain, extracting what was necessary from them in order to reach the truth, taking into account that any of them leads to failure if followed blindly and always willing to listen to the opinion of the contrary as an enriching habit, a pragmatism that was reflected already in her early writings, where she advocated simplicity in method and common sense prevailed, which she always tried to impose with vigour. (Perez, 2010)

There are several significant methodological contributions by Mrs. Robinson, which can be summarised in the following expressions taken from Feiwel: "For this reason I would pay a lot of attention to method. I would insist on the distinction between an accounting identity, a statement of equilibrium conditions and a summary of econometric facts. I would try to destroy the admiration which students feel for formulae, not to induce a sceptical inclination towards intellectual nihilism but to form the habit of separating them into their elements and putting them together again with the ambiguities removed, and keeping them firmly in place as useful instruments for common sense, not as their substitutes..."

"Controversies which arise through the confrontation of contradictory conclusions can easily be settled by examining the arguments which led to them. Each side should clearly state the assumptions on which its argument is based; by mutual criticism they can reach agreement about the consequences of certain assumptions and so can meet in an amicable discussion about the evidence to be found to demonstrate which set of assumptions (if any) is relevant to the problem at hand. For this method to be successful both parties must use it. One party's effort to proceed in this way will be frustrated if the other party continues to reiterate its conclusions or insists that its own set of assumptions is the only one that can legitimately be formulated. Unfortunately most economic disputes derive from a confrontation of dogmas. The style of argument is that of theology, not science". (FEIWEL, 1988)

From another point of view, Professor Joan Robinson devotes a few pages to the teaching of economics in her *Critical Essays* (Robinson, 1988, pp. 117-122). She expresses her concern about the teaching of Indian students at Cambridge University.

He analyses the possible consequences of a supply and demand that is modelled in the classroom, but which may be paradoxical in the Indian reality when applied to a country so different from mid-twentieth century Britain (Robinson, *Teaching Economics*, 1988).

But his suggestions for the teaching of economic science, from the point of view of author management, methodological and thematic issues are illustrated by the following sentences: "We must get rid of logically contradictory concepts and theorems, such as the general equilibrium of supply and demand, the long-run production function, the marginal productivity of capital and the equilibrium size of firms.

Fluctuations in activity should not be thought of as starting from nothing, but as slow, overlapping changes in long-run productive capacity brought about by accumulation, technical change (including changes in the methods of operation of the labour force) and alterations in the composition of output. The interaction between the long-run and short-run consequences of technical innovations is a complicated issue that requires further study.

The evolution of business and trade union policy should be approached in the spirit of observing class and group behaviour in natural history. The analysis of international trade should be preceded by an investigation of the meaning of a "nation" in the relevant senses, something that is not as simple as previously believed. .... For the last twenty years I have tried to trace the confusions and fallacies of neo-classical doctrines.

Over the last twenty years I have tried to trace the confusions and fallacies of mainstream neo-classical doctrines to their origin in the neo-classicals' neglect of historical time in static equilibrium theory, and at the same time to find a more promising option in the classical tradition, revived by Sraffa, which flows from Ricardo to Marx, is diluted by Marshall and enriched by Keynes' and Kalecki's analysis of effective demand. For serious students I would take the bull by the horns and start from the beginning to examine various types of economic systems. Every society (except Robinson Crusoe's) has to have certain rules of the game to organise the production and distribution of output. Adam Smith, Ricardo, Marx, Marshall and Keynes would be treated in terms of the model of an economic system that each of them had in mind and the real problems that each of them tried to solve...

The theory of the relative prices of goods and would make production, accumulation and distribution, examined from the point of view of an economy taken as a whole, the main themes. Keynes' *General Theory* would then take its place as the short-run section of a truly general theory. Here the theory of prices emerges as an element of the theory of distribution, since the relation of prices to money wage rates in the industrial sector of an economy is one of the determinants of the distribution of output between workers and capitalists or the state, and the relation of agricultural prices to the prices of manufactures is a major determinant of the distribution between sectors of the economy...

He would treat markets and the laws of supply and demand not only in terms of an ideal equilibrium already attained, but also in terms of an ideal equilibrium already attained, but also in terms of an ideal equilibrium already attained.

Terms of an ideal equilibrium already achieved, but also in terms of the actual transactions with goods, with their tendency to develop spider web cycles and the violent shocks that are imparted from time to time to the communities that depend on them..... I would deal with welfare in human terms and teach the people how to deal with it.

In human terms and teach students not to look for 'preference surfaces' but for objective evidence of nutritional and health levels. (Feiwel, 1988).

Joan Robinson consistently criticised the teaching of producer theory, based on neoclassical production functions, attributing to them their limitations in explaining the real world and warning against their transmission and reproduction of this misconception over time. In this respect, he stated: "Moreover, the production function has been a powerful instrument of miseducation.

The student of economic theory is taught to write " $X=f(L, K)$ ", "L" being a quantity of labour, "K" a quantity of capital, and "X" a rate of commodity output. He is taught to assume that all workers are equal and to measure "L" in man-hours of labour; he is mentioned the existence of an index number problem as to the choice of a unit of output; and then he is urged to go on to the next problem in the hope that he will forget to ask in what units "K" is measured. Before he gets to ask it, he will already be a teacher and thus habits of lax thinking are passed on from generation to generation" (Robinson J., 1953).

Mrs. Joan Robinson's approach to the teaching of economics is of vital importance today, insofar as in recent times there have been a series of events in the academy, which have evidenced the reaction against the limitations of the mainstream associated with the teaching and application of the neoclassical model, to solve many of the economic problems that have become more acute today, such as unemployment, poverty, inequality in the distribution of income, concentration of wealth, among others.

uch resistance was expressed when a group of students from Harvard University wrote a letter in November 2011 in which they expressed their dissatisfaction with the topics addressed in the course Economics 10 directed by Professor Gregory Mankiw. Their main complaint revolved around the biased teaching of economic theories, as only "a certain - and limited - view of economics" was presented. This protest was that Mankiw's course uses few academic articles and gives priority to textbook-based teaching, which the students denounce as a source of perpetuating the non-discussion of alternative perspectives to the mainstream of the discipline, and which would even lead to the poor quality of learning about economic theories by neglecting debates about the strengths and weaknesses of the different models discussed in class. This last criticism is not new, but it has been central to discussions of undergraduate economics curricula around the world. These debates have revolved around the need for pluralism in the teaching of theories, in recognition of the coexistence of different paradigms that offer diverse paths of enquiry into the world's phenomena (Oeconomialiberalis, 2011).

Another important piece of evidence is that which occurred in France in 2000, where a movement emerged with a similar complaint and managed to take space in the main newspapers of that country, arguing that the curricula had a strong bias towards neoclassical theory, which was fundamentally ideological and not based on the superiority of this paradigm in relation to other alternatives. The French students stated that: "Among all the present approaches, we are generally presented with only one, which is supposed to explain everything according to a purely axiomatic procedure, as if it were the economic truth. We do not accept this dogmatism. We want a pluralism of explanations" (Cataño, 2004).

Similarly, several authors from different perspectives have been proposing changes in the teaching of economics. In Colombia, it was the renowned economist Lauchin Currie. At the time, he expressed his concern about the economics faculties and their merger with the areas of administration and engineering. The essential proposal was for teaching based on interdisciplinarity during the first semesters and he considered it necessary to have a chair in "economic science" for all degree programmes (Currie, 1965).

In the last two decades of the twentieth century in Colombia, economists such as Bejarano and Kalmanovitz, established interesting debates on the teaching of economics and, despite having some epistemological differences, they agreed on giving students an integral vision of economics, which would move away from the single and totalising view of the neoclassical school and surely influenced by the positions of Mrs. Robinson.

"Bejarano also criticised the fact that a sequence of introductions to neoclassical doctrines is followed by Microeconomics or a general economic history to study Ricardo and Marx, as if each were treated as the antecedent of a more complete system, so that the history of the theory is conceived here as the history of the error to the truth". The underlying conception was not that, but that the concrete of history and its relation to economics is more intelligible pedagogically than starting from very abstract assumptions to derive marginal productivities and general equilibrium as a great auction.

Several Anglo-Saxon texts follow this methodology for introductory courses (among others, those of Robert Heilbroner, Joan Robinson, Clement and Poole), which makes it easier to understand later on the nature of the abstractions used by neoclassical economics or many strands of contemporary macroeconomics. The important thing about this approach is that it relativises theories and prevents training people with the sole and exclusive knowledge of a particular school, for example as the Chicago School was taught in Chile". (Kalmanovitz, 1999)

In the same perspective, the renowned economist Celso Furtado highlights his concern in relation to his experience in Brazil. According to him, there is a need for economic training in accordance with the "reality" of each country; this means not importing "canned products" or theories that are ossified in the so-called developed world, but empty in the practice of Latin American countries. Even more important is what he says about the economist's operability: "Today, resources are much more abundant and there are more trained people, but, it seems, there is less possibility to innovate, to use one's imagination".

Paradoxically, it can be seen that there is less possibility of using the imagination in the economist's field of work: everything is more operational. So "could it be that our dearest colleagues who work in administrative departments, state and private institutions and in the financial sector, are lacking in imagination when applying a theory in a country like ours?"

On the other hand, Stiglitz refers to the responsibilities of economists and economic science with respect to economic crises. It is well known that economists did not predict the crisis, or if they did, they did not put in place the measures to tackle it. This author points out in his book "Free Fall" that he, among other economists, did give warnings of the bubble problem but the consensus climate of the dominant paradigm turned a deaf ear to them. In the aftermath of this crisis, and the implementation of clearly problematic economic measures, the result has been the discrediting of economists. It has even been said that economics has been an "arrogant science that has been defeated" for trying to see an almost idyllic scenario of economic profit that has been radically shattered. The clearest problem with economics today is its claim to universalisation, i.e. its attempt to make real equivalence between the reality of economic behaviour and the models applied by economists. In general, economics tries to offer mathematical models that claim to be universal. These models, in turn, are based on two premises: the existence of an archetypal economic agent and the rationality of his or her actions. The economic agent in question acts under certain conditions and economic theory considers that he or she always acts in the same way in the same context, and all of this in a rational and measurable way. As we have seen, this is not true because this agent does not always behave rationally and does not always act in the same way in the face of different stimuli and conditioning factors. Economic dynamics is also based on instability, irrationality and chance, elements that are not usually taken into account in these mathematical models proposed by the discipline. Nor are markets as efficient and balanced as these theories claim, so that the economy, as it is currently conceived, has important shortcomings (Stiglitz, 2010)

All this evidence converges with the statements of Mrs. Robinson who, in 1967, from Cambridge University, affirmed that economic theory did not offer sufficient arguments to explain underdevelopment, taking into account that the neoclassical theory to which she referred avoided addressing issues such as crises, unemployment, development and inflation, typical problems of unbalanced economies such as the underdeveloped ones.

Joan Robinson questioned the theory of equilibrium, on which the whole neoclassical scaffolding is built, as a valid reference to explain the reality of underdevelopment and its structural imbalances and that therefore, the teaching of economics based on this paradigm was misleading for students, to the extent that by relying on a strong formal support, with scientific pretensions, it concealed the real causes of the problems mentioned and therefore limited the formulation of adequate policies to approach their solution. (ROBINSON, *Economic Theory and Political Economy*, 1975).

In this respect, it is pertinent to introduce the excellent article by Professor Robinson, entitled "Dissertation in Oxford by a Cambridge economist", in which she begins her explanation by narrating how a neoclassical professor would teach his student the concept of equilibrium. As it is so illustrative, it is transcribed in its entirety. For this purpose, see Annex No. 1 of this document (ROBINSON J., 1976-a).

Approaching Joan Robinson's contributions from the micro and macroeconomic theory, it can be affirmed that from Sraffa's ideas, she decides to write about the theory of markets. In this way, she wrote and published "Imperfect competition and falling supply Price" (*Economic Journal*, 1932) and her masterpiece *Economics of Imperfect Competition* in 1933, which would place her at the forefront of theoretical and analytical advances, by developing her fruitful suggestion that the theory of value should be treated in terms of monopoly analysis. In this work, the starting point was the conception of the firm as a monopoly, but with the aim of extending the marginal technique to forms other than perfect competition, unifying the analysis of monopoly and perfect competition according to a single principle, which was an advance on the Marshallian approach, since the maximisation of monopoly net income that Marshall dealt with coincided with the criterion that profit was maximum if marginal cost and marginal revenue were equal, with the advance that this method could be used for both competition and monopoly. In this respect, it should be remembered that when Mrs. Robinson was a student she wrote the story of *Beauty and the Beast*, where she masterfully establishes a kind of parody of the Marshallian system from literature (ROBINSON, *Beauty and the Beast*, 1979).

The book, *The Economics of Imperfect Competition*, was intended to provide an operational and simple method so that the theoretical economist could "find answers to the practical problems posed by the real world", in this way Joan Robinson commented "I have prepared the toolbox that is my work, in the hope of helping him in his task". Thus, her technique of analysis, based on simplicity, starts from the fundamental hypothesis of rationality and consists of separating the elements of the situation that influence the individual's decisions into two parts, developing the theory of value on this basis. The main arguments of this book are built on a general relationship between mean values, marginal values, elasticities and the relationships between them, from which all equilibria can be studied.

This method is useful for the real world because obviously no economist can calculate the exact point of maximum net revenue, but if the conditions of supply and demand remain constant over a sufficiently long period of time he can find the value of the most profitable production simply by balancing Marginal Revenue and Marginal Costs and seeing whether selling a little more increases or decreases his net profits. (ROBINSON, *Economics of Imperfect Competition*, 1st ed., 1946.)

In short, Joan Robinson, in his book *Economics of Imperfect Competition*, generalises the development of a method of analysis based on the equality of Marginal Cost and Marginal Revenue and achieves it, building a gateway to extend the theory of supply and demand to real cases in a comfortable way, as well as facilitating the analysis by making it mathematically and geometrically accessible thanks to his "tools", which can be considered as a great merit.

Another of Joan Robinson's great contributions was the study of price discrimination, built on Pigouvian foundations and employing the same analysis he used for simple monopoly: the profit of the discriminating monopolist will be maximum when the marginal revenue of each market is equal to the marginal cost of total production. He also tackles the moral aspects, aware of the fact that "if discrimination were prohibited, more than one railway would not have been built and more than one village doctor would not have set up his office". (ROBINSON, *Economics of Imperfect Competition*, 2nd ed. 1973a)

Although he states that it is impossible to say whether discrimination is desirable or not from the point of view of society as a whole, in any case, comparing the situation with pure monopoly, he considers that "what is almost certain is that some degree of discrimination will be desirable" (ROBINSON, *Economics of Imperfect Competition*, 2nd ed., 1973a), specifically beneficial from a social point of view in cases where the price decrease affects poorer groups of individuals.

If the market is the market for labour, Joan Robinson identifies imperfections due to monopolistic conditions in the product market (what she called monopolistic exploitation) and market imperfections in the contracting of labour (monopsonistic exploitation). Thus, under conditions of imperfect competition the wage received by workers will coincide in equilibrium with the marginal revenue of the marginal product, as the marginal revenue is less than the price, and if under these conditions the marginal productivity of the factor does not change due to the advent of monopoly, the factors' remuneration decreases and becomes less than the value of their physical marginal product, which Joan Robinson identified as "monopolistic exploitation of labour".

In order to eliminate this exploitation, trade union action is necessary, an idea which Joan Robinson has always reaffirmed, and which has been pointed out as a continuation of J. S. Mill's defence of trade union activity: "the exercise of bargaining power against monopoly power raises real wages and increases employment" (ROBINSON, *The Second Monopoly of Labour*). (ROBINSON, *The Second Crisis of Economic Thought*, 1973c).

On the other hand, monopsony in the hiring of labour means that the average cost of hiring labour increases as the employment of this factor increases, if the profit-maximising entrepreneur hires factors up to the point where marginal cost and marginal revenue coincide. For Joan Robinson, pervasive market imperfections are the reason why labour is exploited as part of the structure of the economy, since monopoly is a rule and not an exception.

In the autumn of 1934 his article "What is perfect competition?" was published in the *Quarterly Journal of Economics*, where Joan Robinson defined perfect competition as "a situation in which the demand for the output of an individual seller is perfectly elastic". For perfect competition to exist, the market should be perfect and the number of firms should be large. For the market to be perfect "it is necessary, first, that all buyers are equal in their preferences and second, that at any particular time, each buyer has dealings with only one firm...".



When these conditions are met, an increase in the price demanded by any particular firm would bring about a complete cessation of its sales, provided that other prices remain unchanged. And this is the criterion for determining a perfect market" (ROBINSON, *Critical Essays*, 1st ed., 1984). With respect to the fact that the number of firms is large, it is concluded that the variation in price by one of them does not provoke a variation in the prices demanded by the others, but this does not depend on the number of firms, but on the slopes of the marginal cost curves of the rest of them, so it is impossible to discuss the number of firms necessary to ensure perfect competition, without discussing the marginal cost curves of those that make up the industry.

The smaller the slope, the smaller the decrease in price due to increases in output, and the greater the number of firms, the smaller the slope, but if marginal costs are increasing (conditions of perfect competition) it would be necessary for the number of firms to be infinite for competition to be absolutely perfect, so for Joan Robinson absolute perfection of competition is impossible.

In her theory of economic growth, Robinson's main point of reference is companies, which, with their drive, which she called the "essential animal spirit", are the initial and determining engine of the process of capital accumulation, a vital and dynamic element in the growth and economic development of countries.

This animal instinct is considered relevant to this process of growth and development, since it strengthens the impulse for investment; it gives rise to an optimistic vision of the future; it promotes the increase of scientific knowledge and its exploitation, i.e., its conversion into technical knowledge. Robinson also distinguishes three types of innovations attributable to the "essential spirit of mind": "autonomous" innovations, due to the improvement of knowledge; "competitive" innovations, caused by the struggle between firms; and "induced" innovations resulting from the shortage of workers.

In her theories of economic growth and development, largely decanted in her model of accumulation, Mrs Robinson used the simile of a metal age to represent the different scenarios in which countries can find themselves, in terms of their macroeconomic strengths and weaknesses; she uses the "golden age" as a methodological framework to represent intellectual experiments and to imagine a historical path (not necessarily of equilibrium) in which the rate of accumulation, the physically possible rate of growth and the boundary conditions were compatible with each other.

#### A golden age

"...I have used the phrase "a golden age" to describe a situation in which uniform and steady growth prevails in circumstances of full occupation.".... "...If the rate of

If the rate of accumulation is equal to the possible rate, made up of the rate of population growth and output per person, and starts at a level which is close to full employment and whose composition of plant stock is appropriate to the desired rate of accumulation, then a level is maintained which is very close to full employment, this situation is what I have called a "golden age" (ROBINSON, *Development Theory. Critical Aspects*, 1973b).

He concluded that a "golden age" indicates a utopian state of affairs which may not be found in a present economy, but which needed to be described to show how far capitalist economies are from tranquillity, lucidity and harmony. In conclusion, the golden age was the model of how the economy should be, a state of constant economic growth, which was always intended to be reached.

Despite the fact that the golden age was not the real situation, Robinson found that capitalism, in the midst of all its incoherence, had some coherence, since, developing in a situation of disequilibrium, it made the accumulation of capital, which is the determinant of economic growth, possible in the same way as in that age.

Taking this golden age as a basis, Robinson gradually makes adjustments to it; he moves some variables that were constant in that state to try to make it closer and closer to reality, i.e. he creates in that model ages lower than the golden age: "the deficient golden age", "the limited golden age", "the lead age", "the declining platinum age", "the slowly declining platinum age", "a false golden age", "a false platinum age".

In golden ages the initial conditions are appropriate to constant growth; and, in both true and restricted golden ages, the actual rate of decline that takes place is only constrained by the desired rate. (In a true golden age the possible rate coincides with the desired rate and a level very close to full employment has already been reached). In a restricted golden age, the realised growth rate is constrained by the possible rate and remains at the same low level. In a lead age the realised rate keeps the possible rate low. In a false golden age the possible rate is limited in a different way, i.e. because real wages are at the tolerable minimum. Both in a limited golden age and in a false golden age, the stock of capital available at any time is less than would be sufficient to provide employment for all available workers. In the limited golden age, the stock of capital goods does not grow faster because of a lack of "essential soul impulse"; and in the false golden age it does not grow faster because it is obstructed by the barrier of inflation.

Below is a table summarising the main characteristics of each of the metal ages used in Mrs. Robinson's explanation

Age	Characteristic
Golden age	Uniform and constant growth under full occupancy circumstances. The possible growth rate coincides with the desired rate.
Deficient golden age	Constant growth constrained by the desired rate, and remains at the same low level. The plant stock has the right composition to achieve the desired rate of accumulation, but this is not sufficient to employ the entire labor force.
Limited golden age	Constant growth constrained by the desired rate. With plants adequate to the desired rate of accumulation and full employment already achieved, full employment cannot be attained because the rate of growth of per capita output is not sufficient to make it possible.
Lead age	The possible growth rate keeps the realized growth rate low. An increasing proportion of unemployment means a decrease in the standard of living of the workers, restricting the rate of growth of the population, and in the absence of technical progress, the rate of growth of the labor force could be equalized with the rate of accumulation, the proportion of unemployment being large enough to keep the latter on an equal footing with the former.

Platinum age of accelerated growth	Initial conditions do not allow for steady growth and the rate of accumulation accelerates. A large number of unemployed workers are available, but it is not possible to achieve the desired rate of growth due to the lack of basic plants. Then the investor-seller phase is entered, increasing employment and the ratio of gross investment to output. Consequently, the rate of profit increases, decreasing the real wage rate, unless technical progress is sufficiently rapid.
Slow-growing platinum age	Initial conditions do not allow for steady growth and the rate of accumulation slows down. The proportion of the basic plant is too high for the physically possible rate of growth. Assuming technical stagnation, the growth of the labor force is not fast enough to match the volume of occupation offered by the increasing number of industrial plants. To repress the threat of labor shortage the rate of interest is raised and a brake is imposed on accumulation, lowering the rate of utility of accumulation.
False gold age	Constant growth constrained by the desired rate is constrained because wages are at a tolerable minimum. With inflationary pressures resulting in financial constraints and no labor shortage, if there is no reduction in the real wage, the higher the rate of accumulation the lower the real wage rate. When an increase in nominal wages due to price increases endangers the rate of accumulation.
Fake platinum age	As technical progress continues, the amount of labor required to produce an acceptable minimum real wage decreases. The constant level of real wages is compatible with the increase in the ratio of gross investment to consumption; therefore a rapid increase in accumulation can occur without causing inflation.

**Table 1** Metal age

Source: Own elaboration, based on the article: *A model of accumulation by Joan Robinson in Postkeynesian Economics*, Ocampo José Antonio (Robinson, *A model of accumulation*, 1985)

For Robinson, the analysis of the acceleration principle, which indicates that an increase in income induces investment and, as long as it is accompanied by a corresponding increase in the natural resources exploited, an improvement in technology and an increase in the employed population, is compatible with the decision made by an entrepreneur to increase the rate of production of a commodity and the purpose of investing in working capital, is useful in the debate on economic growth. Robinson called this process "the steady progress model". As for the economic growth of a society in the long run, there are many related factors, but all agree that this is visualized as a process of accumulation of physical capital. In turn, the accumulation of this capital depends on the savings-investment process.

This process is what determines growth, since the causal relationships between savings, investment and growth operate at an aggregate level and with the accelerator principle, which transmits the effects of aggregate demand on investment and, therefore, amplifies the impact of investment on demand, thus generating a vicious circle: a higher level of investment generates more growth, which in turn induces an increase in investment, raises savings, and facilitates the financing of higher levels of investment, and so on.

All these contributions of Mrs. Robinson, mentioned in this text and surely many others that are not mentioned here, plus the evident relevance of this author, make her work even more vigorously recognized today, even if, undeservedly, she has never been awarded the Nobel Prize in Economics, Perhaps because her positions became a "stone in the shoe" for capital, to the extent that they questioned central and neuralgic aspects, especially for the development of poor countries, such as the limitations of capital accumulation, the inequitable distribution of income and the concentration of capital and wealth, among others. But it seems that Mrs. Robinson never needed these awards to achieve her accreditation and academic recognition. Surely, her position as an economist coincided with her position as a woman, "tremendously austere, a strict vegetarian, often dressed in Hindu clothes, wore sandals in winter and lived without heating in a small house surrounded by birds and squirrels." (Perez, 2010)

## Annexes

### Annex 1

#### Oxford lecture by a Cambridge economist

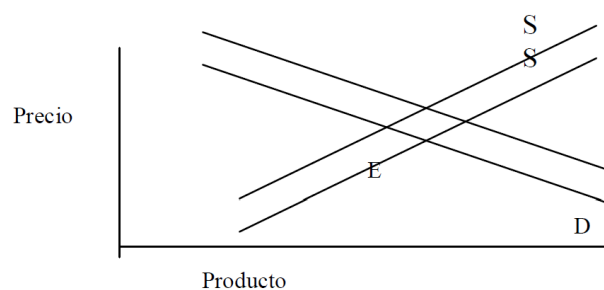
If some of you have been trotting around these parts for a long time, my talk will not please you too much. (For those of you who have not yet taken the plunge, it will suit you like a glove).

Since I am going to give an unpleasant lecture I will begin with an unpleasant joke told in Cambridge. These jokes are commonplace in Cambridge, and, making up for the pluses and minuses, as Marshall says, they are fairly even-handed, but uttered in isolation, among polite and courteous people, they seem in very bad taste.

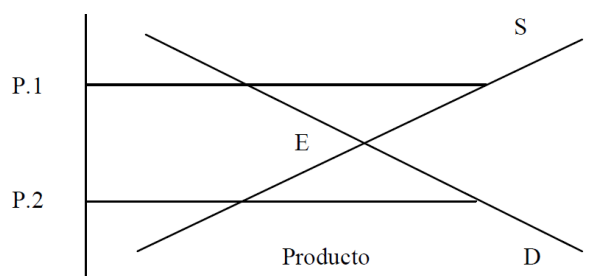
My unpleasant joke goes like this: when an Oxford economist comes to lecture in Cambridge he fills the blackboard with so many equations and diagrams that the audience gasps. I have come to Cambridge to blow them away with this diagram.

Imagine a professor explaining to a first-year student the meaning of equilibrium. The professor is a neoclassical economist. If you like that label, wear it; if you don't, I'll be the first to celebrate.

The professor tells the student: "E is the equilibrium point of supply and demand". And if the young man asks, "What does equilibrium of supply and demand mean?", he will answer: "It is point E". Admirable. You have offered the student a brief excerpt from an illustrated dictionary.



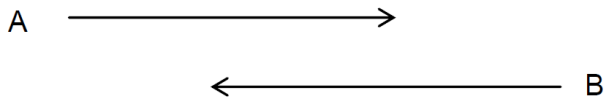
Or you can say:



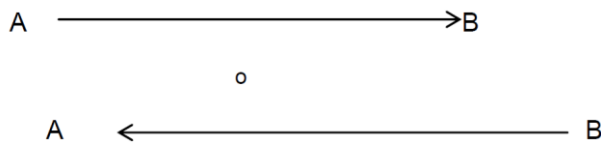
"When the price is OP1, supply is greater than demand and the price tends to fall. When it is OP2, demand is greater than supply, and the price tends to go up. The price may never really be in equilibrium, but it always tends toward the equilibrium point".

Now he's really missing the point. He is employing a space-based metaphor to explain a process that takes place over time.

Have you ever considered the difference between moving in space and moving in time? A and B are two points in space. If the bodies at A and B are not in equilibrium with each other, they will move simultaneously in both directions. Some of the A's will move toward B and some of the B's toward A, and they will cross each other in route.



In time there is a very rigorous one-way circulation. There can be a movement.



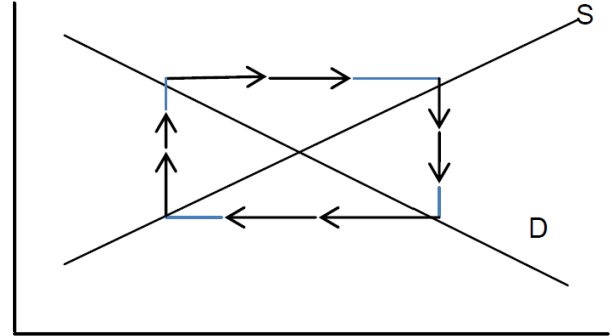
But not both at the same time.

The second characteristic of space is that there is nothing like it in this tending toward (which the first-year student considers extremely wrong, poor innocent). In time, our bodies will actually come into balance. Time can help with space problems. But we can take as much space as we want... How will it help us solve the problems of time?

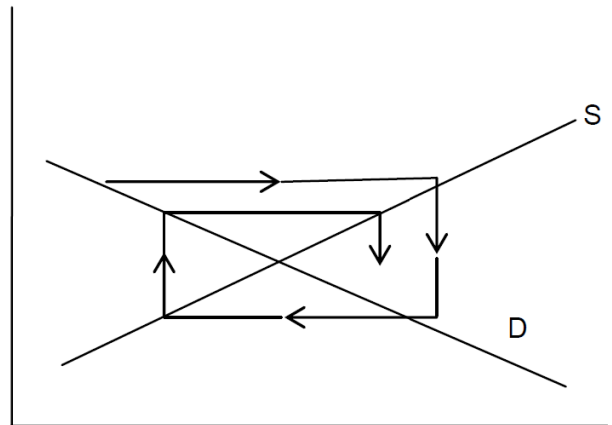
The third characteristic of space is that the distance from A to B is of the same order of magnitude as the distance from B to A. I don't say of the same magnitude because of trade winds and so on.

In time, the distance between today and yesterday is twenty-four hours when we go forward, and another eternity when it comes to going backward. There are many verses that speak of this, but the professor (who never personally knew Keynes) only reads poetry in the evenings, if at all, and would not think of mixing it with his work.

What does this remind you of? The pig cycle, the shipbuilding cycle and the economic cycle. Now, the professor starts to smile a little. It's not the first time you've heard about this.

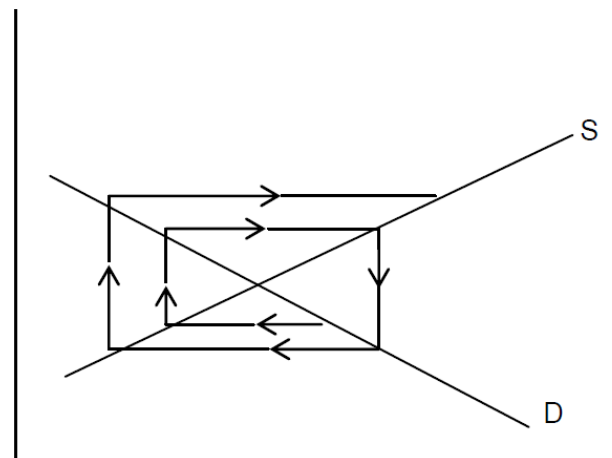


He has two cases. First he says, "Pigs are an exception. If I made a diagram for peanuts, there would be a problem today. We'd have a cycle that's damping down." Go ahead. I'm just asking for an arrow for each movement.



In the first phase, he doesn't seem to be on the wrong track. And in the second phase? His peanut stocks have been varying. In the second phase it would not be the same if you had started from a different point in the first phase. The stocks would have varied differently. The student cannot be expected to accept this kind of trend early in his career.

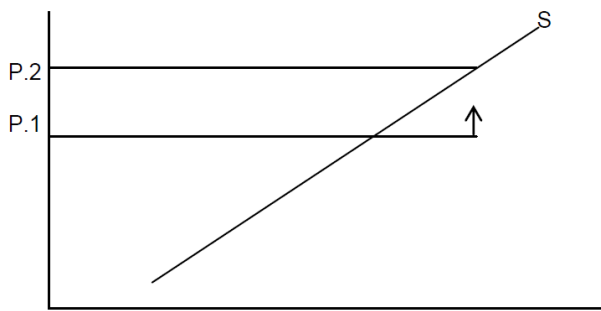
In the meantime the professor tries to get out of the way with his second answer. If the cycle is this way:



You get to infinity in a couple of weeks, which is a logical absurdity.

But now he is playing full-fledged on Keynesian ground. Even if every now and then he manages to throw a ball over the net, Samuelson, Kaldor or Kalecki finish off his play, and he fails to score a single goal. The Keynesians always have the upper hand.

Who in your opinion was the economist who best grasped the idea I am trying to explain with these arrows? Certainly not Keynes. Neoclassical economics smelled rotten to him and he threw it out the window, holding his nose while making really nasty remarks.



Under conditions of rigorously perfect competition, the short-run supply curve never decreases when demand grows steadily.

One jump upwards in time and we find ourselves in a position where the arrow does not create sideways problems, provided we do not move from the short run.

What did you do? The more economics I learn, the more I admire Marshall's intellect and the more I detest his character.

He laid out with great lucidity his short term for forward movements, and then proceeded to fill his book with tear gas, so that no one would notice that he had misrepresented all the rest of the approach. Read Marshall's principles again with a gas mask and you will agree with me.

When Keynes died, the professor pulled himself together a bit and began to read the General Theory carefully, discovering that it was full of terrible errors. (I will explain about the errors in a moment.) Who knew! The professor was so unprepared that he did not even know the first principle of Aristotelian logic. I reason like this: Keynes says I smell rotten.

Keynes makes logical errors, so I don't smell rotten. (The kind of logical errors made by Keynes were not of that order of magnitude).

Now I will explain the errors of the general theory.

The discussion process carries an arrow indicating the time. Here are assumptions A and there are conclusions C.



It is possible to start from A, think and arrive at conclusions. Or it is possible to start from C, think and arrive at the assumptions.

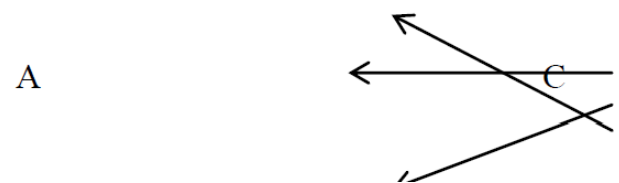
When the reasoning is correctly stated, it is in equilibrium:



Well, all the best. It will be here soon.

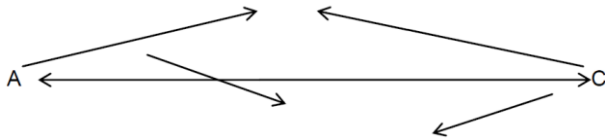
But tigers proceed in reverse. Don't ask me why. It's a fact I observed through my binoculars from a platform.

Galloping in a straight line from assumptions to conclusions is exactly what a horse can do, with a little horse sense and also his thoroughbred energy. But finding the straight path backwards is not at all easy, even for a tiger. The half-finished approach of a tiger can be summed up like this:



The treatise on money is a good example of what I mean, for it does not read as easily with Appendix H, and (in this context) does not bear as good fruit as Marshall's principles, considered globally. So, as far as I am concerned, don't bother. Just remember the headache that gripped us when we first read it.

The general theory of employment, interest and money can be represented as follows:



The equilibrium line is there, but Keynes did not take the trouble to erase all the other lines before publishing it. (You would be surprised how many lines were erased before R. F. Kahn allowed him to publish it. Keynes refers to it in a very gentlemanly way in the Preface).

Well, you see what I mean: when you do economics, don't forget your Blake.

Let us now turn to the long run. The short-run analysis starts from a fixed capital equipment specified in physical terms. There is no need to ask: When is capital not capital? There is a specific list of blast furnaces and rolling stock and other solid objects, and for Marshall a given number of fishing boats.

In the long run, capital equipment varies in quantity and in its design. Therefore, we run headlong into the problem: what is the amount of capital?

I don't want to have to tell you the length of books written on the subject lined up in a row.

We are getting to the really unpleasant point of this talk. All these books are nonsense, in the rigorous sense that Wittgenstein gives to the word: "What can be thought can be thought clearly. What can be expressed can be clearly expressed. What can be pointed out cannot be expressed."

Now this is particularly true in the case of capital. When it is possible to measure a quantity of capital, it can be measured accurately; and when it is a list of blast furnaces and other solid objects, it can be pointed out but cannot be expressed.

So, when you do economics, don't forget your Wittgenstein.

Let us apply the notion of equilibrium to capital. What determines the demand for capital goods? Its possible future quasi rents. What determines the supply price? Its past cost of production.

In the case of solid objects such as blast furnaces or rolling stock the demand is ex ante by its very nature, and the cost is ex post also by nature. The professor will not now be able to get away from the arrows indicating time.

Only in one case is it possible to measure, not to point out, the quantity of capital; that is when the economy as a whole is in equilibrium at our beloved point E.

Never speak of a system in the process of equilibrium, for equilibrium is meaningless unless one is already in it. But consider a system that is in equilibrium and has been so since the time of Adam; it will be profitable for you to follow this line:

Original sin ←—E—

So all the ex ante expectations about the present that were held in the past are being fulfilled in the present. And the current ex ante expectation is that the future will be the same as the past.

So it all adds up. Capital goods are sold today at a price that is at the same time their demand price, based on ex ante quasi rents, and their supply price, based on ex post costs.

Who came to understand this detail? Marshall understood it, in his own perverse way. If you reread his principles, you will notice that the more inconsistent the approach, the denser the cloud of tear gas. But the one who understood it, and moreover, who played fair, was Marx.

He begins to discuss accumulation on the basis of a model of simple reproduction, which is precisely E, in Marx's language. He then advances his model through history and demonstrates that he can never return to E before the day of judgment.

You will recall that Marshall managed to come up with the only case in which it is possible to say something sensible about the theory of market prices: the short-run supply curve under conditions of perfect competition. Who found the corresponding case in which something can be said about long-run development? Harrod, with his guaranteed growth rate (achieved by embellishing the arguments with neutral technical progress and a few other things).

Harrod was somewhat puzzled when I pointed out to him that his theory was contained in *Capital*, Volume II. But he is a conscious Keynesian and has long since thrown back the rotten fish he had eaten. So, past the first impression, he was absolutely right.

Anyway, the theory was published in his book. The guaranteed growth rate is not intended to show that the model is tending towards an equilibrium development path, but that (as Marx said) once it gets out of it, it will not be able to recover it until the day of reckoning.

It all comes down to respecting the rules of the game. Ricardo lays down these rules: embellish the assumptions as much as you like, but always state what you have done.

There is no need to comment on Marshall's way of proceeding. Marx, instead of politely saying, "If you will kindly pay attention to me, I will state my assumptions," falls on his knees and begs and implores us to believe his assumptions, because they constitute the secret of the universe. Although less morally reprehensible, the result is even more disconcerting than Marshall's tear gas. And Keynes often fails to cite a detail here or there because (how rashly) he considered that everyone would notice that it is self-evident.

Ricardo himself was too scrupulous. He resented having to juggle with assumptions. Until his death he was looking for the assumption that did not require juggling. And that ill-fated neoclassical professor took advantage of the vagueness engendered by Ricardo's scruples to imply that he meant the opposite of what he said. If you read Sraffa's *Introduction to the Principles* you will understand that I am not wrong.

## Appendix 2

Main works by Joan Robinson  
(In their original denominations)

*Economics is a Serious Subject: An Economist's Apology to the Mathematician, the Scientist, and the Simple Man*, 1932.

*The economics of imperfect competition*, 1933.

"*Theory of Money and Analysis of Production*," 1933, RES.

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"A parable on saving and investment," 1933, *Economica*.

"What is perfect competition?". 1934, QJE.

"Euler's theorem and the problem of distribution," 1934, EJ.

"Unemployment in Disguise," 1936, EJ.

"The theory of long-run employment," 1936, ZfN.

"Some Reflections on Marxist Economics," 1932, EJ.

*Introduction to the theory of employment*", 1937.

*Essays on the theory of employment*, 1937.

"The Concept of Hoarding," 1938, EJ.

"The rise in the price of supply," 1941, *Economica*.

*Essay on Marxian economics*, 1942.

"The Economics of Full Employment," 1945, EJ.

"Obstacles to Full Employment", 1946, *Nationalökonomisk Tidskrift*.

"The Pure Theory of International Trade", 1946, RES.

"Marx and Keynes", 1948, *Critica Economica*.

"Mr. Harrod's Dynamics," 1949, EJ.

"Exchange Equilibrium", 1950, *Economia Internazionale*.

"The Rate of Interest", 1951, *Econometrica*.

*Collected Economic Papers*, Vol. I, 1951.

"The Model of an Expanding Economy", 1952, EJ.

- The Rate of Interest and other essays, 1952.
- "The Generalization of the General Theory," 1952,
- "The Production Function and the Theory of Capital," 1953-4, RES.
- The Accumulation of Capital, 1956.
- "Notes on the Theory of Economic Development", 1956, Annales de la Faculte de Liege.
- "India, 1955: Unemployment and planning", 1957, Capital.
- "The Philosophy of Prices", 1958, Manchester School.
- "The Real Wicksell Effect", 1958, EJ.
- "Some Problems of Definition and Measurement of Capital", Oxford EP.
- "Accumulation and the Production Function", 1959, EJ.
- Exercises in Economic Analysis, 1960.
- Collected Economic Papers, Volume II, 1960.
- "La Enseñanza de la Economía", Economic Weekly, 1960
- "General Liquidity", 1960, The Banker.
- "Own Rates of Interest", 1961, EJ.
- "Equilibrium Growth Models", 1961, AER.
- "Prelude to a Critique of Economic Theory", 1961, Oxford EP.
- Essays in the Theory of Economic Growth, 1962.
- "A Neo-Classical Theorem", 1962, RES. Economic Philosophy: An essay on the progress of economic thought, 1962.
- "The Basic Theory of Normal Price", 1962, QJE.
- "Solow on the Rate of Return", 1964, EJ.
- "Factor Prices Note Equalized", 1964, QJE.
- "The Final End of Laissez-Faire", 1964,
- "Consumer's Sovereignty in a Planned Economy", 1964, Essays in Honor of Oskar Lange.
- "China, 1963: The Communes", 1964, Political Quarterly.
- "Pre-Keynesian Theory after Keynes", 1964, Australian EP.
- Collected Economic Papers, Volume III, 1965.
- "Korea, 1964: Economic miracle", 1965, MLR.
- "Piero Sraffa and the Rate of Exploitation", 1965, New Left Review. Economics: An awkward corner, 1966.
- "Comment on Samuelson and Modigliani", 1966, RES.
- "The Badly Behaved Production Function", with K.A. Naqvi, 1967 QJE.
- "Growth and the Theory of Distribution", 1967, Annals of Public and Cooperative Economy.
- "Marginal Productivity", 1967, Indian Economic Review.
- "The Poverty of Nations", 1968, Cambridge Quarterly.
- "The Theory of Value Reconsidered", 1969, Australian EP.
- "A Further Note", 1969, RES.
- "Capital Theory Up to Date", 1970, Canadian JE. Freedom and Necessity, 1970.
- "Harrod After 21 Years", 1970, EJ. Economic Heresies: Some old-fashioned questions in economic theory, 1971 .



"The Second Crisis of Economic Theory", 1972, AER.

An Introduction to Modern Economics, with John Eatwell, 1973.

"Formalistic Marxism and Ecology without Classes", 1973, Journal of Contemporary Asia.

"Ideology and Analysis", 1973, in Sozialismus, Geschichte und Wirtschaft. Collected Economic Papers, Vol. IV, 1973.

"History versus Equilibrium", 1974, Thames Papers in PE.

"The Unimportance of Reswitching", 1975, QJE.

"What Are the Questions?", 1977, JEL.

"Employment and the Choice of Technique", 1977, Society and Change.

"The Labour Theory of Value", 1977, MLR. Contributions to Modern Economics, 1978.

"Keynes and Ricardo", 1978, JPKE.

"Morality and Economics", 1978, Challenge. The Generalization of the General Theory and Other Essays, 1979.

"Kalecki and the Economics of Capitalism", 1977, Oxford Bulletin of Statistics.

"Thinking About Thinking", 1979,

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"Garegnani on Effective Demand", 1979, Cambridge JE. What Are the Questions? And other essays, 1980. Collected Economic Papers, six volumes, 1951-1980.

"Misunderstandings in the Theory of Production", 1982, in Feiwel, editor, Samuelson and Modern Economics.

"The Arms Race", 1982, in McMurrin, editor, Tanner Lectures on Human Values.

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