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## François Perroux, a precursor of the current analyses of power

René Sandretto \*

### Abstract:

Without any doubt, François Perroux is one of the most important European economists of the 20th century. Today, in English-speaking countries, François Perroux is recognized mostly for his original contributions in the field of spatial economics and economics of development. However, taking into account the variety of his contributions, Perroux deserves certainly more attention. This paper underlines a less well-known aspect of Perroux's works: his illuminating views on asymmetry, domination and power which can be considered a source of works carried out in this field half a century later, such as the American realist and neo-realist approaches to power or the concept of structural power developed by Susan Strange.

### JEL classification:

B19 – History of Economic thought since 1925

B4 – Economic Methodology

B5 Current Heterodox approaches

### Keywords

Asymmetry, power, domination, influence, coercion, general equilibrium

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## 1. Introduction

Unquestionably, François Perroux is one of the most original European economists of the 20th century. He was a prolific author. His innovations are many, ranging from spatial economics in which he analyzed the economics of location, the forces of agglomeration and dispersion of polarization and diffusion (Perroux, 1949), to the analysis of economic development, including an interesting attempt to develop an alternative approach to the general equilibrium, based on the recognition of the active role of agents (Perroux, 1975 and 1976). Despite a considerable work, François Perroux is not really appreciated to its true value. Perroux' ideas reached the apex of their popularity during the 1960s, namely in Europe and Latin America. Benjamin Higgins, for example notes that he was nominated several times for the Nobel Prize (Higgins, 1988). In his famous book: *The Development of Economic Thought*, W. Spiegel considers Perroux to be “the only living economist who developed a theoretical system rivaling conventional equilibrium economics” (Spiegel, 1952). Similarly, John B. Parr underlines that during this decade, the perrouxian concepts of “Growth poles” and “development poles” were adopted enthusiastically by regional economy analysts and planners (Parr, 1999). A similar judgement was given more recently by Stephen Meardon (2001). Even though the assessments of Higgins, Spiegel and many others do not represent a clear consensus they clearly suggest that at that time Perroux was held in high regard by many of his peers.

Since then, Perroux' thinking gradually sank into oblivion, namely in English-speaking countries. Part of the reason for that is related to the fact that Perroux did not publish a lot in English. Actually, he published in many different languages: Spanish, Italian, German, Portuguese, Polish, Hungarian, Rumanian, Japanese, even in Esperanto. But, among the 689 publications registered in his less incomplete bibliography compiled by Michel Chai<sup>1</sup> less than 3% were initially published or subsequently translated or reprinted in English. Surprisingly, works such as *La*

*Coexistence pacifique* (Perroux, 1958), *Economie et Société. Contrainte, échange et don* (Perroux, 1960), *Pouvoir et Economie* (1973) and even his masterpiece *L'Economie du XXe siècle* (1961) have never been translated into English.

However, more recently, some of the main ideas that Perroux defended so forcefully seem to experience renewed interest. The Nobel prize awarded to Krugman with whom Perroux is frequently associated can be considered a proof of this revival.

Among the various topics to which Perroux made important contributions, the most insightful and not so well recognized one is his “domination effect” and his analysis of power. This paper aims at underlining Perroux’s innovative views on asymmetry, domination and power. More precisely, my objective is to bring to light how and why his contributions can be considered a source of works carried out in this field half a century later.

When, in 1948, François Perroux wrote his famous article “Esquisse d’une théorie de l’économie dominante” (Perroux, 1948, 1950), he was obviously influenced by the economic and political context of the times. In 1945, the United States had become the dominant economy in the world, and it seemed destined to remain so for many years to come (Perroux, 1953). A superficial reading of this seminal article might lead one to believe that Perroux had restricted himself to constructing a theoretical architecture, based on this single concrete example. But Perroux’s range of interest was considerably broader.

In the present as in the past, an analysis of the effect of domination on international relations tightly conditions our knowledge of current affairs. After the Second World War, lopsided power relations induced trade imbalances and generated an irreversible orientation of trade and financial flows that was apparently incompatible with the creation of a new international economic multilateralism. At the same time, the chronic shortage in international liquidities raised formidable threats to the viability of the Bretton Woods arrangement. Creditors seemed to remain

perpetual creditors; debtors became more and more indebted.

The domination effect and the concept of the internationally dominant economy offer particularly penetrating views of the new world that was being built in the early second half of the 20th century. The scope of Perroux's analysis, however, is of a completely different nature. As this paper shows, it is much larger and more ambitious.

Our purpose, in the following pages, is to conduct an in-depth analysis of the content of Perroux's concepts of domination, dominance and power and to examine how these seminal ideas were precisely implemented in Perroux's works, empirical and theoretical. To that end, I want first to stress the operational character of Perroux's concepts of asymmetry, domination (and dominance), and power. Even if some of his writings can be considered highly theoretical and philosophical, the major and permanent concern of Perroux throughout his entire work was to design analyses leading to a better understanding of the world in which we live. His entire body of work bore witness to the imperative upon which he unremittingly insisted: a symbiosis between the "theoretician's discourse" and the "observer's discourse" (section 2). Then I describe more thoroughly the relations between structures and power (section 3) and the difference introduced in Perroux's later publications between domination and dominance (section 4).

The most interesting aspect of Perroux's thinking is that the domination effect represents a common denominator and a key to interpreting a multiplicity of apparently heterogeneous phenomena (section 5). This concept is probably what confers upon Perroux's work its overarching character and its pioneering feature (section 6). The components of power relations called asymmetries, inequalities, and irreversibilities therefore constitute central themes and structural elements. For Perroux, they are the main building blocks of any attempt to the renovation of the general equilibrium theory which he considered a necessity along with a new way of looking at human beings and society (section 7).

## 2. The Concept of Power and the Domination Effect

Starting with Max Weber, Perroux defines power as “the probability that an agent within a social relation will be in a situation to make his own will effective, in spite of resistances (...) The essence of power, sought after, used, expected, or predicted, is an asymmetric relationship that stems from unequal actions and reactions” (Perroux, 1973: 30). This asymmetry of influence, which he calls the *domination effect*, can exist between various units: individuals, firms, social groups, nations, and others.

It is useful at the outset to quote Perroux’s own definition: “To consider just two economic units, we would say that A exercises a domination effect over B, when, in the absence of any particular intention, A exerts a certain influence on B without the reverse being true or true to the same degree. A dissymmetry or irreversibility of principle or degree is constitutive of this effect” (1948: 248). As an imperfect form of reciprocity and interdependence, the domination effect is therefore not necessarily the expression of a desire for power. It may also be the consequence of an existing situation – the result of differences in size and disparities in structure.

According to F. Perroux, the domination effect has three essential components. The first one is the *relative sizes of the units*, including factor components, assets, respective contributions to supply and demand, information available, and so on. The second one is the *bargaining power* – the units’ respective abilities to negotiate conditions and exchange rates, or even to set the rules of the game. Lastly, a unit’s domination effect results from its *belonging to an active zone*, the position that it occupies in that zone, and the nature of the activity that it exercises. Of the three above components, the last one is the least intuitive. It is, however, fundamental. The implication is that the strength or domination of one unit is not reduced exclusively to its individual features, but results from synergies and externalities – from the connection between the unit and its “environment.” For this reason, Perroux’ multifaceted concepts of dominance and power have a

lot of empirical applications. At the level of the firm, among several possible illustrations, the perrouxian growth poles analysis is based on the central role of the propulsive firms whose innovative capacity and leadership exert an asymmetrical (but stimulating) influence on other firms (Vázquez-Barquero A., 2002). This analysis gave rise to growth pole policies. At the macroeconomic level, one possible illustration of the domination effect is the “macro-decisions” of the governments (see below 2.2). But, obviously, the international level is the most important application field of power relations (see below 2.1 and 3.).

### 2.1. Unintentional Domination

Unit A exerts a dissymmetrical influence on other decision-making centers, even though it has no desire to act on them, by increasing or decreasing its production or by changing its prices. The other units must adjust to A’s decision by changing, in turn, their level of activity and/or their prices, without these reactions affecting or influencing A to the same degree.

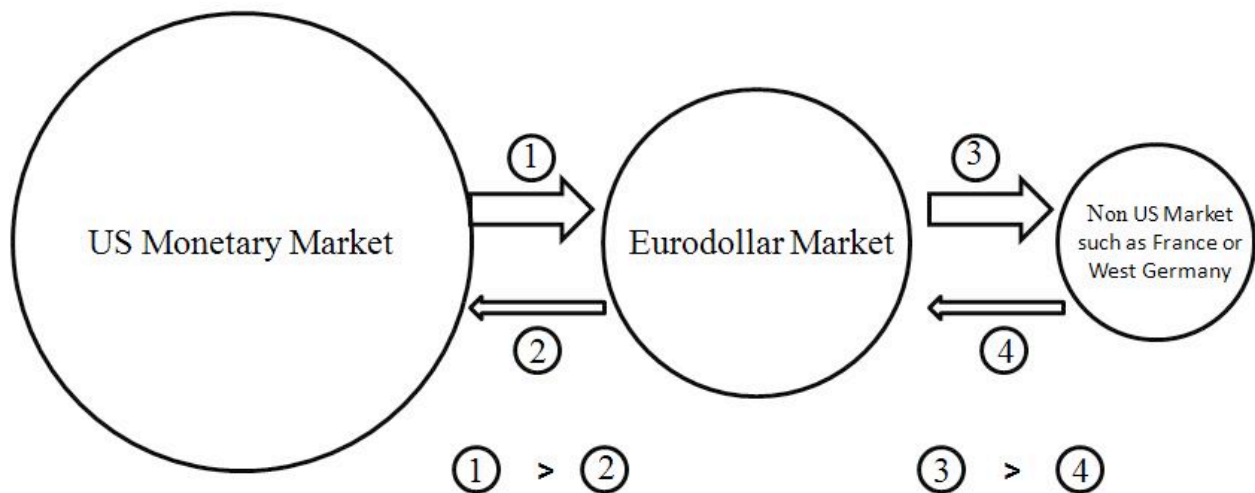
This effect can be clearly observed when we examine, for example, how changes in the monetary or budgetary policy of the United States affect the circumstances of its partners. The domination effect may take the form of a cumulative sequence of asymmetrical influences in concentric rings. For instance, a restrictive monetary policy conducted in the United States to reduce domestic inflationary pressures forces other industrialized countries to align themselves by raising their interest rates. Attempts at disconnection almost always prove to be impractical, except through rigorous control of the exchange rate (this is the first circle of asymmetry). The corresponding rise in international interest rates then induces a more strongly asymmetrical influence on developing countries, which are indebted at a floating rate, by increasing the service of their debt (this is the second circle of asymmetry).

An internationally dominant economy thus appears to be a “relatively autonomous” conjunctural centre of momentum, which, independent from any hegemonic intentions, influences the

situations of its partners. In a world that is *de facto* increasingly globalized, the interplay of irreversible and dissymmetrical influences develops both directly and indirectly along more or less complex chains (or sequences) of domination effects.

The market for Eurodollars is a cogent example. During the critical period of dislocation of the international currency system (late 1960s and early 1970s), the Eurodollar market undeniably served as a communication channel for an indirect domination effect. Unintentional at first, it relayed the influence of the American monetary market to other national monetary markets, especially with regard to determination of interest rates and pressures on exchange rates. This asymmetry in the constraints exerted on (or exerted by) foreign monetary markets was to some extent determined by the comparative sizes (masses) of the respective markets at that time (see figure 1).

Figure 1. Relative masses of monetary markets<sup>2</sup>



Not only are the unintentional asymmetrical relations of A and B evident in terms of quantitative magnitudes of flows and prices, but they may also result from asymmetrical structural changes. A structural change made by unit A, even with no desire to affect unit B, imposes structural transformations on the latter with little or no reciprocity.

Analogous linkage, distribution, attraction, and polarization effects – or, on the contrary,



inhibition, braking, or blockage effects – can easily be observed between a variety of units: first, between competing firms through innovations, industrial or financial concentration, choice of production diversification, and so on; secondly, between industries, for which interdependences are never symmetrical. Some industries exert asymmetrical induction effects on costs, prices, productivity, and the dynamics of technological change on activities both upstream and downstream. (Static inter-industrial matrices of goods and services record these effects only very imperfectly). Third, these effects are observable between regions that are unequally able to mutually supply net consumption or investment flows (taking account of their respective weights and urban agglomerations), and also have an unequal capacity to induce growth and attract material, human, and financial resources. Fourth, they are observable between nations, which are unequally capable of causing cyclic variations. Lastly, to these effects are added asymmetries that may arise between units of different nature, such as between large firms and their regions, between the capital city and the regions, between urban areas and countryside, and so on.

## 2.2. Intentional Domination

The domination effect may also be exerted deliberately and in an even more obvious way. In contrast to unintentional domination, the study of intentional asymmetrical actions involves the subject's plan, the advantages it seeks and obtains, its desire for power, and its field of action. Perroux (1973: 31 and seq.) distinguishes three modalities of power relationships corresponding to three kinds of intentional domination effects.

- *Influence*. Influence means that Unit A tries to change the behaviour of unit B without force, through persuasion, using its authority to encourage participation or imitation. Thus, A exerts over B a power “beyond its capacity to force the other to do or not to do” (Perroux, 1973: 31). The phenomenon of the *leader firm*, as has long been observed, for example, in global nickel and aluminum oligopolistic markets, is characteristic of this type of influence. Without being forced,

firms explicitly or tacitly align their decisions regarding prices, production, investment, and other activities with choices made by one of them, which plays the role of *barometric firm* (Stigler, 1947). A similar situation arises with regard to social conditioning of consumption linked to Duesenberry's ratchet effect and the respective effects exerted by "influence merchants" (through advertising and the media) on consumers and citizens.

- *Imposition or coercion*. Through the use of force or violence, A forces B "to do" or "not to do." The field of action may be more or less extensive. It may be manifested between decision-making units or between groups of social actors or classes. It is seen primarily in, for example, relations between the metropolis and its colonies and is most transparently the result of macro-decisions (Perroux, 1949 and 1961) made by the government, as a "monopolizer of legitimized violence" (Perroux, 1961: 377). It may also take place between private actors, particularly in the form of "production prices" (set and imposed unilaterally for a time by a firm or group of firms). However, it is most visible in international relations (embargoes, blockades, prohibitions, reprisals, retaliation, and the like).

- *Subordination*. According to Perroux, "subordination involves the duration of the coercive action by A (individual or group) on B (individual or group). This is the area of structural influence, institutionalized or not" (Perroux, 1973: 32) – that is, an *orbiting* process linked to the combination of all of A's asymmetrical actions with regard to B, which tend to substitute (more or less completely) the decision-making power of the former for that of the latter (Perroux, 1969).

### 3. Structures and Power

Of course, the distinction between intentional and unintentional domination effects does not mean that these two “varieties” are mutually incompatible or independent. Although Eugen von Böhm-Bawerk (1914), in *Macht order ökonomisches Gesetz* rejects the subordination of human beings to a structural determinism that destroys their quality as actors, he tries to show that the “influence of power” (*Machteinfluss*) is exerted even more easily and durably when it is based on a “position of power” (*Machtstellung*) that respects and uses economic laws. Perroux’s asymmetry analysis provides a powerful tool, with the domination effect, towards a better understanding of the complex relations between “structures” and “power”. Two examples can illustrate these relations.

- *Trade in raw materials.* Industrialized countries and raw material producing countries have unequal capacity to influence trade and international markets. Indisputably, raw material producers would be less vulnerable and their negotiating power would be stronger if: (i) they were not so hyper-specialized (sometimes mono-specialized), as opposed to the *diffused* specialization of industrial countries. (ii) If industrialized countries were not so dangerous competitors in the export of raw materials. Contrary to a received idea, the most important exporters in raw materials (agricultural and mineral) are developed countries. (iii) If they were not sometimes forced to sell at any price, and were less dependent on markets in industrialized countries and on foreign firms. Transnational firms also intentionally structure relationships.

- *Location strategy of transnational firms.* In some particular industrial sectors, transnational groups sometimes apply what may be called a strategy of “specialization/diversification” in which each of their subsidiaries is made into an ultra-specialized plant. In this strategy, the transnational firm spreads the geographic distribution of its subsidiary plants in different countries for each stage of the production process. For example, one subsidiary of a car

manufacturer will produce only brake pads, and this part will be manufactured simultaneously in Mexico, Brazil, and Asia.

This particular strategy is obviously a case of intentional implementation of structural power relations. It leads, among other things, to a productive and spatial structure that generates domination effects between the firm's management and the government and social groups in the host country. It minimizes the effects on the firm of potential technical, political, or social incidents. It dissuades host countries from nationalizing foreign firms established on their soil, since each "plant" is viable only within the industrial group upon which it is totally dependent. It also protects the industrial group against the consequences of strikes, which are not internationally coordinated. On the other hand, this structure makes the group's threat or counter-threat of lock-out or closure credible to both unions and local governments, since a local production stoppage does not disrupt the group's activity (Sandretto, 1995).

These two examples clearly illustrate that power relations do not come out of the blue, but that they may be structurally determined.

#### 4. Domination and Dominance

In his later writings, Perroux has refined his analysis of the domination effect with the distinction between 'domination' and 'dominance' depending on the intensity and extent of asymmetrical relations (Perroux, 1975):

- *Dominance* is a degree of asymmetry that cannot be evaded over a given period, resulting from the asymmetry in the respective influences, which is such that Unit A exerts an influence on B, while B exerts an influence on A but not at the same degree.

- At the opposite, *domination* (strictly speaking) is corresponding to an intrinsic dissymmetry of principle (total irreversibility, always within a given period). In other words, domination would correspond to total dominance. Perroux also sometimes used the term *domination* to designate crystallized dominance in structures and institutions.

Analytically, dominance is more interesting than domination, as it has a greater range. As F. Perroux wrote in a personal correspondence with the author “*Total* dominance of A over B destroys (economically) *duality*” (Perroux, 1975b) because it suppresses B’s quality as an actor – its decision-making capacity, individuality, and integrity. This may be why Perroux abandoned the expression of domination (and “domination effect”) for the more general one of “dominance” in his later writings.

The main problem resides in the difficulty of measuring the intensity and effectiveness of the dominance effect. Expressing it in the most general terms, Perroux characterized the search for the most useful result possible in the behaviour of two units, A and B, in a relationship of pure trade. This point is reached when A and B equalize the marginal return obtained and the marginal return ceded:

$$\frac{\text{Marginal return obtained}}{\text{Marginal return ceded}} = 1$$

The impact of the dominance effect, according to Perroux, is evaluated by the *external advantage of pure trade* – by the proportion within which the respective performances of A and B may deviate from the above standard of optimality and equity. The breadth of the dominance effect may thus be quantified by the price supplement that A imposes on B above the marginal cost of the good that it is selling or by the difference between the remuneration to the holder of a production factor and that factor’s maximum marginal productivity.

Following a similar approach, the international neoclassical equilibrium model described by Heckscher, Ohlin, and Samuelson (the HOS model) can be interpreted as the standard of *equal*

*trade*, conflictually neutral, from which all dominance relations are axiomatically excluded (Sandretto, 1976). Measurement of economic power by deviation from the model of pure trade (or the ideal model of perfect competition) is both simple and attractive on the conceptual level. But is it the most operative and significant in practice? According to Perroux, the answer is no, because it refers not to a particular concrete situation, but to an unrealistic model – a fictitious one.

## 5. Power, keystone of the Perrouxian analysis

In *L'Économie du XXe Siècle* (Perroux, 1961), Perroux shows the importance of the dominance effect within his work. The structure itself of this book reflects this prominence.

This major work begins, in fact, with a section devoted to the dominant economy (Part 1). It is followed by a study of spatial, linkage, and agglomeration asymmetries – in other words, the formalization of the *growth poles* which are a direct application of the dominance theory (Part 2). Then comes the concept of *macro-decisions*, a clear example of the structural decision-making power of a dominant actor: with the help of the irreversible and asymmetrical influence that it is capable of exerting, the macro-decision imposes the rules of the game on and shapes the environment of the other units (Part 3). The analysis then turns to the process of development and underdevelopment, which is dependent on the coupling mechanisms that link the various parties in the global economy and the asymmetries that it supports (Part 4). This process leads to the identification of the forces of dynamism and progress, the main one of which is the search for power (a motivation “as powerful as the search for well-being or monetary gain” [Part 5]). Economic movements are accomplished by human beings, innovation, and power. They result from the intersection of the behaviours of “diversely and unequally active” units (Part 6). We can thus see that dissymmetries and irreversibilities of power relations, far from being dispersed instruments in an analytic toolbox, are essential aspects of an overall interpretation.

In this work – no doubt Perroux’s most important synthesis – the dominance effect appears to be the common denominator in most of his key concepts. Later, it became the bedrock of an overall theoretical reformulation and of his last project: the construction of a theory of general equilibration (Perroux, 1975).

The concept of economic power elaborated by Perroux is deduced from his analysis of asymmetries, irreversibilities, and constraint “in a universe of actors.” It is no exaggeration to state that this concept of dominance is the cement that gives his complex body of work its coherence.

## 6. A prefiguration of the most recent analyses of power

Perroux’s concept of power can be compared to more recent concepts of power. In the American neo-realist approach, power is relational. First, in a context of strong asymmetries, power can be applied through constraints. In the contemporary American neo-realist analysis, power is defined as the capacity of unit A (state, firm) to directly force unit B to do what it would not have done spontaneously, in order to better satisfy the interests of unit A. This is called *hard power*, because it relies on the comparative strengths of units A and B: military power, natural resources, demography, capacity to inflict damage on another or to avoid such damage. The “hard power” is one of the key concepts of the American neo-realist school of thought, whose one of the most prominent representative is Kenneth Waltz (1979). In contrast to this, the American liberal institutional approach has emphasized the quite different concept of *soft power* based on cultural ideological and political attraction, and on the attractiveness of the way of life of the leading country(ies) (Nye 1990: 167). Actually, in the globalized multipolar and complex world in which we are living, the reinforcement of global interdependences creates a situation such that hegemonic (hard) power is increasingly difficult to exert. Force cannot always easily impose power. Power then tends to change in nature. Leading states attempt more and more frequently to

exert influence through other instruments than military force or economic constraint, using state's capacity to seduce, convince, or yet induce through cultural and/or ideological attraction. More than traditional means, *soft power* is based on intangible assets (culture, way of life).

Another important recent contribution to power analysis has been achieved by Susan Strange. Similarly to François Perroux, Susan Strange suggested a structural approach of power, that is a concept of power basically linked to structures and, more generally, to the environment in which agents' actions take place. She defines power as the capacity of an individual or a group to influence a situation in such a way that the preferences of the individual or group have priority over others' preferences (Strange, 1996). In other words, power is the capacity to conceive, legitimize, implement, and control rules for individual and collective action. This amounts to the capacity to shape structures within which other actors will have to evolve. The Strangeian concept of power is also structural in so far as it relies on structural components.

Strange suggests four basic power structures:

1. Security structures, the way in which each society organizes and manages its protection against various risks (wars, terrorist threats, natural catastrophes, epidemics, food and environmental security)

2. Production structures (e.g., multinationals, innovation)

3. Financial structures (with financial globalization)

4. Knowledge structure, a domain in which asymmetries of acquisition and holding of knowledge have increased dramatically with recent changes in communication technology

On the basis of these concepts, Strange puts forward two major theses: first, she contests the thesis of a U.S. decline. Second, all states (including the United States) see their capacity to act on society and the economy decline in comparison with private actors. Therefore, zones of *ungovernance* – spheres in which neither state nor non-state actors can master events (in



particular in the field of finance and the environment) – evolve. Consequently, S. Strange considered that if the most important global risk in the long run is related to environment, the closest risk of global crisis will have to do with the world financial system and a risk of systemic financial global crisis. Obviously, the current financial crisis has vindicated this forecast.

The above brief contextualization of approaches to power shows the extent to which Perroux's own approach was seminal. Half a century earlier, Perroux had framed an approach that incorporates American neo-realism, liberal institutionalism and the Strangeian approaches, each of them appearing as specific cases of this Perrouxian unified theoretical framework, since this last one includes both relational and structural powers. Perroux' point of view suggests that hard power, soft power and structural powers can be regarded as different aspects of a more general conceptualization.

Indeed, it is easy to recognize the hard power as a modern expression of imposition or coercion, while the soft power is quite similar to influence in the Perrouxian typology. Similarly, structural power, as described by Strange, is reminiscent of unintentional dominance along with the Perrouxian suggestion that intentional dominance can rely on unintentional dominance. In both Perroux and Strange we can also find the idea that power relationships are structurally conditioned.

## 7. Conclusion

Perroux's acceptance at the outset of asymmetrical and irreversible actions explains why his analysis was so strongly distinct from the major traditional currents of economic analysis. It may also explain why his analysis sank into a relative oblivion during so many years. In several publications, Perroux criticized the various processes whereby the mainstream economic analysis eludes the power relationship, namely:

- the waterproof partitioning between *economics* (often considered a science of means) and

*politics* (as a science of ends), which leads to a tendency to associate power only with government power and extract it from the economic sphere (belonging to the private sector),

- the rudimentary separation of *economic* relations (superficially conceived as merchant relations governed by private profitability) and *social* relations (often trivially considered an obstacle or a corrective to economic activities),

- the separation of economic *variables* (prices and quantities) from extra-economic *data* (rules of the game, institutions, ownership regimes, power relations, and so forth).

Finally, Perroux was fundamentally opposed to reductionist simplifications – the neoclassicists’ irenicism (total absence of conflicts) and the Marxists’ polemicism (unavoidable confrontation between two inherently antagonistic classes) (Perroux, 1970: 2271). For Perroux, *all* exchanges are of a hybrid nature: they mix free and reciprocal transfers and power relations (Perroux, 1973).

Economic relations, as any social relations, intimately blend conflict and co-operation.

One of the main questionings that we find in several publications of Perroux was: can the neoclassical model be amended? François Perroux believed that the very foundations of the model were defective. In his opinion, the neoclassical theory would not be improved by the introduction of power, for it would certainly then be ruined. In short, according to an aphorism that Perroux borrowed from Oskar Morgenstern: "there is no road from L. Walras to reality" (1988b, p. 83). Thus, he considered that a complete reconstruction on other foundations was necessary. Of course, this conclusion is debatable. However, it still remains that despite important recent improvements related namely to the game theory, the general equilibrium theory did not really succeed in taking into account this “rebellious exile” as Perroux described power. The integration of power in the heart of economic analysis is still a challenge.

Perroux tried to perform this reconstruction by replacing equilibrium with equilibration of active units’ energy for change: “Equilibration is a chain of decisions and acts over a period of time.

The state that we call *equilibrium* is the more or less durable persistence of sequences conveying, under explicit structural constraints, the cross-compatibility of actors' projects and activities" (Perroux, 1975: 148). Thus reformulated, the general equilibration of an economic set is attained when the sum of the actors' energies for change is close to zero.

Unfortunately, this theoretical reconstruction project is both uncompleted and incomplete. As a result, it leaves the reader frustrated not to find something more revolutionary which would really replace the Walrasian approach. As Stephen J. Meardon judiciously points out the model developed by Perroux in 1975 "is not specified mathematically". Perroux' representation has nothing to do with "a mathematically specified general equilibrium model that fulfills the same functions as the Walrasian model, but in addition captures the exercise of market and extra-market power that the Walrasian model entirely misses".

The fact that Perroux failed to achieve a complete theoretical alternative reconstruction to the general equilibrium model does not condemn the project itself and its necessity. It does not invalidate in any way Perroux's ideas. His last book published in 1975 is full of intuitions and suggestions aimed at transforming the concept of general economic equilibrium from its initial description as a balance of forces applying to objects (to robots) towards a representation which incorporates the active role of economic agents and their power relations. In other words, towards the modelling of a process which tends to make compatible agents' plans as well as the change energies that they develop individually and collectively.

The fact that this project has not been brought to a successful conclusion is a limitation indeed. However, in one sense, it also remains a potential: an invitation to present and future generations to resist mental laziness and follow and explore the rocky path that Perroux opened up.

## Notes

1. Unpublished document.

2. In 1974, the size of the American monetary market was around 20 times as big as the Eurodollar market. At that time, we could consider the Eurodollar to be some kind of second Federal Reserve System. Since then, the situation has completely changed: the Eurodollar grew much more rapidly than the American monetary market and the respective masses reversed in 1981 (Sandretto, 1993)

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