



# TEXTO PARA DISCUSSÃO

ISSN 0103-9466

425

**Revisiting Perroux's development poles:  
the cases of Italy and Brazil**

**Annalisa Caloffi  
Mauricio Serra**

**Fevereiro 2022**



**ie** Instituto de  
economia

# Revisiting Perroux's development poles: the cases of Italy and Brazil

Annalisa Caloffi <sup>1</sup>  
Mauricio Serra <sup>2</sup>

## Abstract

François Perroux was an economist of strong convictions and fruitful ideas. His belief, which was also shared by other eminent development economists of his time, that backwardness was not a fate is entirely reflected in his development pole theory, which has a prominent place within the regional development theory. This implies that his theory was highly influential, as evidenced by the fact that strategies based on development poles were implemented around the world, in both developed and developing countries. Although these strategies took different forms, largely depending on the specific contexts in which they were applied, there was a common factor in all of them, which was the importance of the direct use of large-scale investment resources to generate the hoped-for structural changes through accelerated economic growth. Looking carefully at the Italian and Brazilian cases, it should be noted that the development pole strategies had, in addition to the use of heavy investment resources already mentioned, some common characteristics, such as: the focus of attention directed towards the backward regions, specifically the Mezzogiorno region in Italy and the Amazon region in Brazil; the fight against regional disparities within both countries through structural change and the strengthening of backward regional economies as an underlying reason; and the active participation of the State in the drawing up and implementation processes of development poles. This paper aims at comparing the development pole strategies in Italy and Brazil, highlighting similarities and differences of these experiences in triggering the long-awaited regional development.

**Keywords:** Perroux, Development poles, Regional development strategies, Italy and Brazil.

## Resumo

François Perroux foi um economista de fortes convicções e ideias frutíferas. A sua crença, que era igualmente comungada por outros eminentes economistas do desenvolvimento do seu tempo, de que o atraso econômico não era uma fatalidade está inteiramente refletida em sua teoria dos polos de desenvolvimento, que ocupa um lugar de destaque na teoria do desenvolvimento regional. Isto implica que sua teoria foi extremamente influente, tal como evidenciado pelo fato de que as estratégias baseadas nos polos de desenvolvimento foram implementadas ao redor do mundo, tanto em países desenvolvidos quanto em desenvolvimento. Embora essas estratégias tenham assumido diferentes formas, muito em função dos contextos específicos em que foram aplicadas, havia um fator comum em todas elas, que era a importância do uso direto dos investimentos em grande escala com o propósito de gerar as desejadas mudanças estruturais por meio do crescimento econômico acelerado. Ao se olhar atentamente para os casos italiano e brasileiro, pode-se notar claramente que as estratégias dos polos de desenvolvimento tiveram, além dos elevados investimentos, algumas características comuns, tais como: o foco de atenção direcionado para as regiões atrasadas, especificamente a região italiana do Mezzogiorno e a região amazônica brasileira; a luta contra as disparidades regionais dentro de ambos os países por meio de mudanças estruturais e do fortalecimento de economias regionais atrasadas como uma razão subjacente; e a participação ativa do Estado nos processos de elaboração e implementação dos polos de desenvolvimento. O objetivo deste artigo é comparar as estratégias dos polos de desenvolvimento na Itália e no Brasil, destacando as semelhanças e diferenças dessas experiências no desencadeamento do tão esperado desenvolvimento regional.

**Palavras-chave:** Perroux, Polos de desenvolvimento, Estratégias de desenvolvimento regional, Itália e Brasil.

**JEL:** B31, O20, R58.

---

(1) Department of Economics and Management, University of Florence, Italy. Email: [annalisa.caloffi@unifi.it](mailto:annalisa.caloffi@unifi.it).  
ORCID: <http://orcid.org/0000-0002-7819-5173>.

( 2 ) Institute of Economics, University of Campinas, Brazil. Email: [mserra@unicamp.br](mailto:mserra@unicamp.br). ORCID:  
<http://orcid.org/0000-0002-5643-425X>.

## **Introduction**

This paper focuses on the concept, formulated by François Perroux, which has been most successful in the field of regional economics, namely the growth pole (Higgins and Savoie, 1968). In addition to its scientific relevance, this concept has influenced the public debate and the design of development policies in many countries around the world. In doing so, the growth pole – initially formulated in an abstract space – has been measured against the challenges posed by real territories and their different socio-economic conditions (King, 1974; Kinsey, 1978; Ryder, 1990).

Policies aimed at creating growth poles have been promoted in many countries to facilitate the development of lagging-behind regions and reduce regional gaps (Parr, 1999). This is the case in Italy and Brazil, which we analyse in this paper. The two countries are united by the fact that here the policies for the creation of growth poles have been aimed at reducing the regional gaps between the North and the South of the country (Higgins, 1968). Such policies, implemented from the 1950s to the 1980s, were part of a broader framework of policies that were aimed at addressing the problem of regional imbalances, which was considerable in both countries. In Italy, in the 1950s, the gap between the North and the South was significant, with respect to all indicators relating to employment, income, productivity in industry and agriculture, education, and mortality. The gap had become so important that the effort to promote the South became central to post-war policies (Rosenstein-Rodan, 1955). In Brazil, the gap between the North and the South of the country (as opposed to Italy, which favoured the latter) was such that the South was home to modern, higher-productivity industry, while the North was home to traditional, low-productivity sectors. In the 1950s, growth was concentrated in a few rich areas of the South, where most of the national income was produced, but where only part of the national population lived (Baer, 1965, cited in Higgins, 1968).

In both countries, the national planner placed great trust in public investment to stimulate growth. The poles were in fact built around the activity of public enterprises operating in what were considered impulse sectors (e.g., iron and steel, chemistry) and public investment in infrastructure that was supposed to trigger growth and make the location attractive to other private investors.

As we will discuss in what follows, the poles in the two countries do not seem to have been fully able to stimulate the hoped-for economic growth processes, let alone solve the problem of the country's North-South gaps, which still persist today. However, especially in some places, they have contributed to the growth of certain economic activities in lagging-behind regions that would hardly have developed otherwise.

The article develops as follows. Section 1 describes the concept of growth pole, and contextualises it in the Perrouxian theoretical framework. Section 2 and 3 are devoted to the analysis of the policies that have been implemented in Italy and in Brazil. In both sections, we also present the case of a major development pole to better illustrate how the pole concept was implemented in the two contexts. Section 4 sums-up and concludes, by highlighting similarities and differences of these experiences in triggering regional growth and regional development.

### **1. The Perrouxian theoretical framework**

Throughout his long professional life, François Perroux was a highly productive and combative economist. Deeply rooted in the humanist and European traditions, his vast work, which

is full of fruitful and original ideas and concepts, influenced many economists of his time and also of future generations. His article on development poles is an illustrative example of this influence insofar as it not only gave rise to a lasting and intense academic debate on regional development, but also stimulated several governments around the world, both in developed and developing countries, to design and carry out development poles strategies.

Although development poles are the main focus of this section, this concept is embedded in a broader theoretical framework, in which Perroux's economic thinking cannot be dissociated from his world view. This means that understanding both the concept itself and its transformation into an effective instrument of regional policy requires that some key elements of Perroux's "broad theory" be addressed. However, before doing this, it is important to place his work in historical context.

According to Perroux (1998b), the term "poles" has its roots in his lectures at Harvard University in the late 1940s and was first employed in his 1950 article on economic spaces (Perroux, 1950). It is worth noting that the term in his article had the same meaning as centers or *foci*, which later contributed to a conceptual misunderstanding about growth poles. It was only in the mid-1950s that Perroux set up the concept of "growth poles", which stemmed from his observation that "growth does not appear everywhere and at the same time; it appears at growth points or poles with varying intensities; it spreads along diverse channels and has varying terminal effects for the whole of the economy" (Perroux, 1955a, p. 308).

This sentence, widely quoted in regional development literature, including by Albert Hirschman (1958) in his seminal book *The Strategy of Economic Development*, has two important implications. The first concerns the construction of the growth pole theory itself. The underlying idea is that efforts should be made to strengthen those poles in sluggish-growth regions with the clear purpose of starting a process of sustained regional economic growth. The second one, and perhaps more important, is intrinsically related to the nature of development itself. In fact, the emergence of growth poles in the course of the development process denotes that growth asymmetries, both international and interregional, are an inexorable condition of growth itself, which is, in geographical terms, essentially unbalanced. This means that imbalances and development are inextricable.

Indeed, the idea that development, once started, would be a smooth and progressive process provides an extremely unrealistic picture of reality, especially in the context of developing countries. This illusory reality was a direct result of the neoclassical paradigm, with its simplistic and narrow general equilibrium approach. The search for a truly general explanation is pointless inasmuch as generalisations, although they may seem seductive, do not capture the complexity as well as the multiplicity of problems that development entails. As societies are very different, problems and solutions are necessarily different. It was for no other reason that Perroux became a severe critic of neoclassical economics (Bernis, 1990; Chambre, 1990; Higgins, 1988; Perroux, 1969; 1988b; 1991). It should be stressed here that Perroux's perception that disequilibria were intrinsic mechanisms to the development process was in line with the main ideas of Hirschman (1958) and Myrdal (1957), who were the major dissenters of the then dominant balanced growth theory in the 1940/50s and also critics of neoclassical equilibrium.

It is important to highlight that this alignment of ideas clearly shows that Perroux was acutely aware of the then current literature on economic development. Like many early development economists, Perroux had little faith in free market forces as main drivers of development, and he

believed that economies as a whole required, to a certain degree, both planning and co-ordination. There is here a clear influence of the successful Marshall Plan, which was implemented between 1948-1952 with a twofold objective: the reconstruction and economic co-operation of the Western European economies affected by the Second World War and the containment of the advance of communism. With massive financial assistance, European economies showed signs of rapid recovery and surpassed past levels of development. The remarkable success of this experiment contributed tremendously to the strong belief among economists that promoting development was entirely feasible.

Two key issues in Perroux's theoretical framework are domination and power, which are intertwined and pervade his work, including its core approach: the growth poles. As already mentioned, growth – and hence development – does not spread itself evenly across geographic space. This implies that they necessarily entail polarisation, in which the concentration of agents, resources and economic and technological capacity is a vital prerequisite for producing and disseminating the propulsive effects. The clustering of growth in a given geographic space leads not only to extensive and cumulative changes, but also to agglomeration of economic power, which in turn has close connections with the effects of domination. It should be stressed here that the domination effect, in Perroux's understanding, goes beyond economic dimension insofar as it is related to social structures and the organisation of space. Furthermore, asymmetric power relations, according to Perroux himself, can be perceived at different levels, that is, between individuals, companies, regions and nations (Perroux, 1969; 1991; 1994).

Drawing on Schumpeter's insight about the pivotal role played by innovation in economic development, Perroux pointed out that innovations were the driving force of economic growth. Indeed, technological and organisational innovations would be responsible for increasing the productivity of labour and capital. Nonetheless, they would tend to be concentrated in certain companies, the propulsive industries, which would be clustered in particular places. If technological innovations are deemed the engines of economic growth, they are also important sources of power generation in market economies. Furtado (1994) underlined that this power is not only the main factor for the transnational integration of economic activities, but it is also at the origin of the asymmetries that bring about underdevelopment.

This issue was also a focus of attention for Perroux (1955b; 1969; 1991), who stressed that underdeveloped countries were characterised by a duality in which a few existing growth islands were surrounded by empty or stagnant regions. Furthermore, these countries had both a marked heterogeneity and a juxtaposition of poorly articulated economic sectors. Owing to structural reasons, obstacles to growth and development were the rule rather than the exception, which means that the development process in those countries had barely started or was then incomplete. In short, they were not only disconnected, but also dominated economies, from which the financial dependence was its most visible face. The effects produced by domination considerably worsened both the disconnection and the insufficiency of living standards. It is no coincidence that Furtado (1994) stressed the convergent thinking of Perroux and Prebisch in which the latter, through his centre-periphery concept, emphasised the dynamics of the structure of world inequality, which favoured developed economies (centres) to the detriment of underdeveloped ones (peripheries). In other words, the dynamics of the global system itself were directly responsible for the uneven development of nations.

A crucial point to be made here is that Perroux's general theory – in which the growth poles occupy a prominent place – aimed to account for the realities of a world in deep and rapid change. In this regard, three elements assume considerable importance: the inequalities of agents, their particular strategies and the geographic space. However, they cannot be dissociated from issues related to domination and power, which also have impacts on the organization of geographic space itself. It is worth recapitulating that the unequal power relations, which can be verified at all possible levels, served as the basis for Perroux's theoretical development on economic spaces and growth poles, with a later use for regional development. Therefore, the spatial implications of development in geographical terms were not the focus of attention of Perroux, who aimed to both describe and explain the process of economic development, through the growth poles, in an economic space, which was essentially abstract.

It is important to bear in mind that Perroux made a significant contribution to regional economics. Considering that growth did not emerge simultaneously or regularly across the economy and that it tended to be polarised, he deepened his understanding of the development process by pointing out that propulsive industries had particular characteristics, which were the tendency to cluster in geographical space; to generate spread effects on their environments; and to grow faster, by virtue of being highly innovative, than other industries that were linked with them. Accordingly, propulsive industries produced domination effects on others. As development is an essentially polarised phenomenon, Perroux underlined that the growth poles were a source and, at the same time, disseminators of innovations. This means that they played a crucial role in regional economies insofar as they were sources of regional dynamism itself and, above all, generated positive effects elsewhere.

Many policy-makers, government officials and professionals in general turned to the Perrouxian theoretical framework with the hope of finding insights and, principally, a solid groundwork for promoting the development of their backward regions. Perroux's ideas, especially regarding to growth poles, fitted in well with the regional contexts in which those professionals operated. Indeed, while they were looking for ways to address their regional problems, the theory emphasised that growth poles should be stimulated in order to start a process of self-sustained regional economic growth. In addition, there was an underlying and bewitching idea that it was fully feasible to promote economic growth, tackle regional inequalities and, at the same time, encourage the integration of lagging regions through a decentralized development strategy. Despite the interest and wide acknowledgement of the growth poles concept, there was a major challenge to be faced: the transformation of that concept, conceived in an abstract economic space, into an operational instrument for regional planning.

This task was carried out by Perroux's disciples, who made a determined effort to make the concept useful for regional planning, keeping in mind the diversity of regional contexts. As a direct result of several attempts to put the concept into practice, Perroux's theory was significantly widened, but not all these attempts were in line with the original ideas. For this reason, many scholars, notably Higgins (1983; 1998), pointed out that Perroux's disciples had misinterpreted his theory, and thereby applied a completely distorted version, that is, an entirely different theory. Although it is beyond the scope of this section to analyse misconceptions about Perroux's pole theory, some important points should be highlighted. In fact, distortions in the application of the pole theory occurred. They stemmed from various factors, such as misinterpretation by professionals involved in regional planning, different political contexts (the theory, because of its underlying idea, had a very strong

appeal) and Perroux's vagueness with respect to various concepts. Nonetheless, Perroux himself (1988a) was aware of the contributions of his disciples, recognized the validity of many of them, especially Boudeville (1966; 1968), and also stressed the prompt and lasting acceptance of his pole theory.

It should be pointed out that both concepts – growth pole and development pole – were employed interchangeably in the literature. For instance, Hansen (1967, p. 710) underlined that “a new body of thought has emerged in recent years which centers on the notion of development poles (*pôles de croissance* [growth poles])”, which had been introduced by Perroux (1955a) in his well-known article “*Note sur la notion de pôle de croissance*” (Note on the concept of growth pole). Perroux himself (1988a, p. 48) stated that “a considerable literature has evolved around the concept of growth pole (pole of development) in France and elsewhere”. There is no doubt that growth and development are far from synonymous and that all scholars were perfectly aware of this difference. The terminological confusion, however, has its roots not only in Perroux's conceptual imprecision, but also in the very belief that one thing led to another, that is, that growth, once started, would trigger development. Furthermore, both growth and development can occur jointly in the same region. All these factors actually contributed to blurring the distinctions between growth and development poles inasmuch as the predominant idea was that development – spatial and sectoral – was centred on growth, which did not emerge neither simultaneously nor uniformly throughout the economy. Irrespective of the chosen term, the key point is that both growth and development poles were applied to regional development policies with the same purpose, i.e. to produce beneficial spread effects for the regional economy as a whole.

Although the beneficial spread effects were supposedly generated by dynamic and innovative propulsive firms, investments were considered crucial for enabling growth impulses and, at the same time, expanding their diffusion, thus promoting economic development. This expansion was intrinsically linked to the complementarity effects of investments because the success of isolated investments only occurred during a certain period of time. The main purpose was that the investment, once made, would encourage new investments, in which this sequence was brought about by the linkage effects (Hirschman, 1958). It should be stressed that these linkage effects, centred on the idea of industrial interdependence, had far-reaching practical implications for investment decisions as policy-makers and regional planners would be guided by structural bottlenecks showed up by the market, therefore avoiding the usual praxis of anticipating supply and demand imbalances. The rationale was that investments in specific firms and sectors with strong backward and forward linkages would generate a large multiplier effect on the regional economy. It is not a coincidence that Perroux (1969, 1991), who was completely in line with Hirschman, underlined the importance of both the ability of invest and the inducement of decision making for the process of development.

Within this context, a deliberate creation of development poles became the centre of all attention. Indeed, in countries marked by imbalances, the induced development poles would be a sort of magic bullet as they would generate, through extensive and strong linkages between firms, the long-awaited spread effects for their own regions, thus contributing to the strengthening of national economies. It is widely accepted that the 1960s was at the height of the so-called “Keynesian era” (Hall, 1989), a period marked by both the judicious use of macroeconomic management and a proactive role of the State. In this regard, developed economies showed sustained economic growth, high levels of employment and low inflation rates. Despite the success of Keynesian macroeconomic

policies, structural problems in these economies persisted. A concrete example of this structural problem, which also affected developing countries, was the continuing population growth of large urban centres and the simultaneous shrinkage of backward regions. The solution lay in the setting up of development poles, which could be induced by government policies directed towards infrastructure, capital subsidies and a number of other incentives. As a consequence, these induced poles would absorb substantial contingents that tended to migrate to large, congested urban centres.

According to the theory, these poles were expected to operate as both attraction and balance poles. This means that they would benefit from agglomeration economies and also generate spread effects to their immediate lagging regions, thus promoting a “balanced growth” throughout a country in years to come. As Hansen (1967; 1968) pointed out, an illustrative example of this strategy based on induced medium-size development poles was the French regional policy of the 1960s. Eight urban centres (“*pôles d'équilibre*” [equilibrium poles]) were selected and investments channelled into them with the clear purpose of stimulating both economic and population growth. These positive impacts were expected to offset the growth of Paris. It is worth noting that there was a close connection between the development pole strategies carried out in the 1960s and the model of hierarchical diffusion of innovation that was prominent at that time. The rationale behind this is that induced poles were implemented in order to “link lagging regions more closely with the national system of hierarchical filtering and spread effects from urban centres to their hinterlands.” (Hansen, 1981, p. 22).

Another point worth highlighting here is that development pole strategy was one form of the top-down development approach, which was mainly characterised by supply-driven policies. Therefore, these policies centred their attention on the infrastructure provision as well as the attraction of industries as an important means of leveraging the economic development of backward regions. The economic backwardness would be overcome by breaking the regional isolation. In this regard, the belief in the 1960s and 1970s was that the right solution for depressed regions lay both in improving infrastructural endowment and in attracting large firms. Within this specific context, the economic take-off, a term coined by Rostow (1960), of these regions was strongly conditioned by a resolute participation of the State, with its national development strategies, in the economy. Due to the different realities, development pole strategies took different forms, as the Italian and Brazilian cases clearly show. Both experiences will be analysed in the next sections.

## **2 Looking at the Italian experience: development poles in Mezzogiorno**

In Italy, the promotion of development poles inspired by Perroux's thinking took place within the framework of the special policy for the Mezzogiorno (“Intervento Straordinario per il Mezzogiorno”), launched in 1950 (Cafiero, 2000; Pescatore, 2008). The Mezzogiorno was an area of the country that showed a much lower level of socio-economic development than the North and the Centre of Italy. The disparity with the rest of Italy was evident in many areas – from literacy to industrialization to household incomes – and was widening (Lepore, 2020). Consistent flows of migrants moved from the regions of the South to the richer areas of the North or to other countries.<sup>3</sup> In the idea of the policymaker, this special policy would have provided a temporary support to the

---

(3) Following SVIMEZ (1950, cited in Higgins, 1986), between 1861 and 1936, the Southern regions lose around 3.8 million inhabitants (i.e., about 40% of the natural increase of the population) due to migration to the North of the country or to other countries in search of work.



lagging-behind areas of the South, aimed at creating the conditions for development (Galisi, 2014). However, following repeated extensions, this “temporary” support continued until the 1990s (D’Antonio, 2002).

Through this special policy, the Italian government – guided by the national technocracy that managed the various public policy organizations – tried to rebalance the country’s economic growth processes by promoting an agricultural reform, creating various types of infrastructures and supporting the development of industrial activities (De Benedetti, 2013). The special policy targeted the southern regions of Abruzzo, Molise, Campania, Apulia, Basilicata, Calabria, Sicily and Sardinia, and some very small lagging-behind areas in the Centre of Italy (the provinces of Latina and Frosinone, Elba Island, Giglio and Capraia, the municipalities of the Cittaducale district and the Tronto river drainage district). The organization that was to finance the development projects in these areas was the Cassa per il Mezzogiorno, a public body, which was established in 1950 by the Law 646 (Pescatore, 2008).<sup>4</sup>

The industrial strategy of the Intervento Straordinario per il Mezzogiorno was based on Perroux-inspired development poles. The influence of Perroux’s ideas came from the fact that many of the technocrats who played an important role in the design and implementation of this strategy – and, more generally, in the definition of an Italian regional policy – were actively participating in the process of creating the European Economic Community (Adorno, 2015).<sup>5</sup> The national debate was therefore strongly influenced by (and, in turn, influenced) the reflection taking place on the European level, to which François Perroux contributed greatly. However, the idea of a pole was dropped into the reality of policies for the development of lagging-behind regions without much theorizing. Although many of the technocrats who worked on the formulation of a plan for the development of the Mezzogiorno were economists, they did not show any particular theoretical interest in the pole concept, apart from the fact that the concept of a development pole was consistent with the emerging idea of regional policy as a policy aimed at reducing territorial imbalances (Schachter and Schachter, 1968; Pace, 1969). Realizing its potential usefulness, they basically limited themselves to applying the concept in policy practice.

## 2.1 The policy promoting development poles

The policy promoting development poles (initiated with Law 634/1957) was aimed at attracting in the lagging-behind regions of the South investments in new large industrial plants by companies operating in basic industries. The latter would have absorbed local labour and could have triggered the emergence of upstream and downstream activities, as well as a number of complementary industries.

---

(4) For the first 10 years of its operation, from 1951 to 1960, the Cassa del Mezzogiorno was allocated 100 billion Italian Lire per year. In 1952, the allocation was increased to 1,280 billion Italian Lire to be used in the period 1951-1962. The Law 634 issued in 1957 provided further 760 billion Lire to the budget of the Cassa and extended its operation period up to 1965.

(5) One of these was Pasquale Saraceno, a famous Italian economist and founder of SVIMEZ, an organisation whose aim was to promote the development of Southern Italy, who actively participated in the process that led to the definition of the Treaty of Rome that established (in 1957) the European Economic Community.

The sectors involved were metallurgy, chemistry and some branches of the mechanical engineering industry, which were expected to expand in the years to come, and whose firms could benefit from the labour pool available in the Mezzogiorno. Once some basic infrastructures had been created, it was the opinion of policymakers that there should be no obstacles to the localization of these firms in the Mezzogiorno (Adorno, 2015). Moreover, these sectors were considered more capable than others of stimulating the birth of complementary industries and thus spreading development.

The industrial development areas in which the poles were to be created were identified by consortia promoted by municipalities, provinces and chambers of commerce, which could formulate industrial development plans.<sup>6</sup> The Cassa per il Mezzogiorno granted funding (initially, with a contribution not exceeding half of the current expenditure, later increased) to these consortia to construct the basic infrastructures that were needed to host the industrial activities of the poles. The same law that set up the poles established the obligation for state administrations to reserve 40% of their investments in the Mezzogiorno, and the commitment for state-owned companies to locate at least 60% of their new investments, and in any case not less than 40% of their investment, in these areas (Graziani et al., 1973; Del Monte and Giannola, 1978; Giannola, 1979).

The law also established a substantial system of financial, credit and fiscal incentives aimed at small and medium-sized enterprises, which, if located in municipalities with a population of less than 75,000 inhabitants (extended to 200,000 by Law 555/1959), would benefit from non-repayable grants covering 20% of their investment.

The Law 555, issued in 1959 identified a double typology of industrial settlement on the basis of size, distinguishing between industrialization areas and industrialization nuclei (Figure 1). While the former were based on the presence of large plants created by big companies, the latter also included smaller-scale investments by small and medium-sized enterprises.

The first poles developed around large-scale investments made by big, public-owned companies (Florio, 1995; Pirro and Guarini, 2008). Important production facilities were located in Southern Italy, including Finsider's IV steel center in Taranto, Alfa Sud in Pomegliano, Montecatini's petrochemical plant in Brindisi, Saras refinery in Sarroch, and mechanics in Naples and Bari. In 1966, 16 industrialization areas (hosting the development poles) and 26 industrialization nuclei had already been created. Many more were developed in later years.

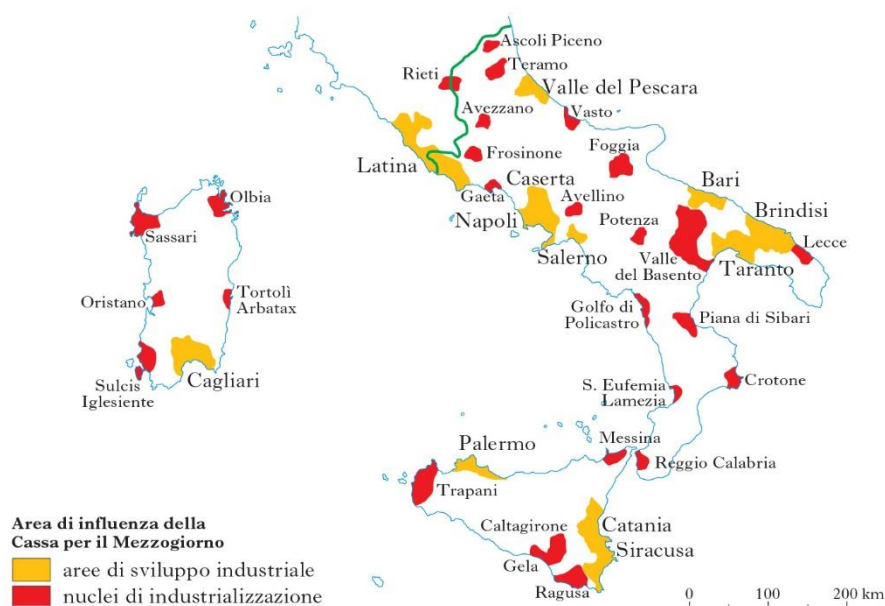
The policy aimed at the creation of development poles, which was initially seen as temporary, was extended until 1980, and survived even later in the procedures of 'programmed bargaining' ("programmazione negoziata"), which were launched in 1968 and are still present today.<sup>7</sup>

---

(6) The consortia were funded by the Cassa del Mezzogiorno and were politically directed by the Committee of Ministers for Southern Italy (Comitato dei Ministri per il Mezzogiorno), which had two consultative bodies: the Technical Commission for Industrial Development Areas, with the task of controlling that the areas identified by the consortia met a number of requirements; the Commission for the Territorial Regulatory Plans, with the task of approving the regulatory plans.

(7) Today, the instruments of the promoted development poles around companies, including foreign ones, which were (and still are) invited to locate in lagging-behind areas on the basis of an investment programme agreed with the national and local policymakers (Giunta; Florio, 2002).

Figure 1  
Industrialization areas (hosting development poles) and industrialization nuclei in the Mezzogiorno



Source: Adorno (2015)

Note: Industrialisation areas (the poles) are highlighted in yellow. Industrialisation nuclei are highlighted in red.

## 2.2 Finsider's pole in Taranto

An important pole, with a history well documented in the literature, is the one that developed around Finsider's IV steel centre in Taranto. Finsider – Società Finanziaria Siderurgica S.p.A. – founded in 1937, was the company of the IRI Group (Istituto per la Ricostruzione Industriale, a public body that managed the State's shareholdings in economic activities) that operated in the steel sector. From 1945 onwards, Finsider was directed by Oscar Sinigaglia, a well-known industrialist who was appointed by the government to reorganize the entire iron and steel sector, also thanks to the funds coming from the post-war European Recovery Program. The so-called Sinigaglia Plan provided for the reorganization of Finsider (which at the time already had three plants: in the north-west, in Genoa, in the centre, in Piombino, and in the south, in Bagnoli) and its expansion from the production of raw material to the manufacture of semi-finished products for industry. With the aim of expanding into full-cycle production on a large scale, Finsider set up the fourth steelmaking centre in Taranto, around which one of the largest development poles in Southern Italy developed (Balconi, 1991).

The Finsider (later Italsider) plant, whose creation began in 1960 and ended in 1965, absorbed a large workforce. By the end of the 1960s – i.e., in about a decade from the start of its construction – the factory had generated about 12,500 jobs. The presence of job opportunities reversed the trend of previous years towards migration to the North. In the 1960s, Taranto was one of the few areas in the South where migration flows were inward rather than outward. Overall, the number of people employed in economic activities in the province of Taranto rose from 28,000 in 1951 to around 40,000 in 1961 to 70,000 in 1971 (Bonel, 1975, cited in Cerrito, 2010). Most of these jobs were in industry,

but service activities also developed. The latter mainly involved personal services, which arose as a result of the increase in the local population. The creation and expansion of the plant gave a strong impetus to the growth of employment in local construction activities (5.4 million working days in the creation phase and up to 14,000 workers in the expansion phase following Cerrito, 2010). Some productive activities developed around the plant, related to the production of metallurgical products or metallurgical processing. The port of Taranto greatly increased its freight traffic, becoming the second most important port in Italy.

Despite this, according to many authors, the pole did not generate all the desired spillover effects (Cerrito, 2010). In part, this was due to the nature of the steel sector and of the processes that were carried out in Taranto – mainly integrated cycle processes that took place within the plant. External connections, if any, were mainly with the parent company for the supply of raw materials. The main clients were extra-local. For this reason, not many upstream and downstream activities related to the steelmaking plant, nor many complementary industries grew in the area (Pirro; Guarini, 2008).

The crisis in the steel industry – the formal state of crisis of the European steel industry was declared by the European Community in 1980 – had repercussions on the Taranto plant, and slowed down its growth for some years. However, the plant resumed its growth in the subsequent years and in the 2000s it was the largest steel plant in Europe. During the 2010s, production has been stopped on some occasions, due to severe environmental pollution problems (Romeo, 2019). In 2012, a major clean-up and redevelopment of the plant and the whole city of Taranto where it is located was initiated by the Italian government, which is still in progress<sup>8</sup>.

### **3 The Brazilian case: development poles in Amazonia**

By underlining the importance of Perroux's work in the formation of a thought that enabled the conceptualisation of underdevelopment, Furtado (1994, p. 17-18) stressed that his "ideas greatly influenced social science research in Latin America because they complemented Raul Prebisch's vision in terms of 'centre-periphery'". With regard specifically to Brazil, Perroux's influence was considerable. Furtado himself (1997), who worked with Prebisch at ECLAC<sup>9</sup> and was Minister of Planning, had been his PhD student at the Sorbonne in the late 1940s and was therefore entirely familiar with his ideas. Boudeville (1957; 1964), one of Perroux's most prominent disciples, lived in Brazil and published two significant studies on development poles for the Brazilian states of Minas Gerais and Rio Grande do Sul. In addition, there were some French intellectuals, mainly geographers, teaching at Brazilian universities and employing Perroux's concepts. All these presences were essential to disseminate Perroux's theory, with particular emphasis on development poles, among Brazilian professionals involved in regional problems.

The acknowledgement of Perroux's ideas in Brazil is clearly reflected in the various national development plans drawn up from the mid-1960s to the mid-1980s. It should be stressed here that this long period was marked by the military dictatorship, and therefore regional strategies based on

---

(8) See "Protocollo d'intesa per interventi urgenti di bonifica, ambientalizzazione e riqualificazione di Taranto". Available at: <https://web.archive.org/web/20121203020349/http://www.governo.it/backoffice/allegati/68907-7918.pdf>. Last accessed on 2 October 2021.

(9) Economic Commission for Latin America and the Caribbean.

development poles were carried out within a specific context characterised by strong State authoritarianism. This means that these regional development strategies are intrinsically associated with both the economic and geopolitical aims of military governments (Serra, 2003). The armed forces seized power in a coup d'état in 1964, dealing a death blow to democracy, which was interrupted for twenty-one years. With the support of the industrial and financial elites and most of the middle class, a “new” project for the entire Brazilian society was set in motion. Based on a triple alliance between State capital, transnational firms and the national bourgeoisie (Evans, 1979), this project combined orthodox economic policies with both a deliberated State intervention and widespread political repression.

### 3.1 Development pole policies: a brief overview

When the first military president took power in April 1964, Brazil was experiencing a period of high inflation. Therefore, the government's highest economic priority was price stabilisation. Its relative success in bringing down the annual rate of inflation, which dropped from 100% in 1964 to 20% in 1969 (Lara Resende, 2014), combined with institutional reforms, paved the way for the rapid economic growth achieved by the country over the following five years. In fact, the economic success, confirmed by the average annual growth rate of 11.2% (Lago, 2014) and then termed “economic miracle”<sup>10</sup>, generated not only a wave of optimism and pride in the government, but mainly the confidence that an accelerated economic growth was definitely the key factor to modernise Brazil, making it comparable to developed countries as well as a regional power in South America. That was the general goal of the military regime.

Despite the “miracle”, the economic success was short-lived and the reason lies in the fact that the government opted for the consumer durable-goods sector as a means of attaining rapid economic growth. This implies that the development of the industrial park was neglected, culminating in the relative deterioration of the intermediate-goods and basic-inputs sectors. As a result of the rapidly growing imports, a crisis occurred in the balance of payments in 1973, which was made worse in the same year by the first oil shock. It was within this economic context that General Geisel assumed the Presidency of the Republic (1974-79). His government launched the Second National Plan (PND II, 1975-79), which focused on the intermediate inputs and capital goods sectors, deemed the final stage of the import-substitution industrialisation (Brasil, 1974). The shift in the Brazilian economy's focus meant that the 1973 crisis was deliberately ignored. In fact, PND II's strategy for overcoming the serious problems in the balance of payments was to maintain high rates of investments, which made it possible to achieve high rates of economic and industrial growth (Carneiro, 2014). In short, the main goal was to repeat at any cost the high growth rates achieved in the previous period.

It should be noted the central role played by the State in leading the development process throughout the military regime, mainly in the last stage of import-substitution industrialisation. State-owned enterprises were considered of strategic importance to enable the country's accelerated modernisation. Indeed, they represented a significant State intervention in the economy, which was

---

(10) The term appears in quotation marks because high economic growth rates experienced by the Brazilian economy at that time were accompanied by worsening social indicators.

expanded to encompass those sectors that had important strong backward and forward linkages (Evans, 1986; 1995). In this regard, the government made all efforts to determine, articulate and provide, through joint ventures, massive investments in order to change the production structure of the economy; build the infrastructure needed to integrate different systems; and also to produce the intermediate inputs indispensable for heavy industrialisation, especially the chemical and metallurgical industries. Another aspect worth highlighting is the fact that the first oil crisis greatly contributed to the government's determination to exploit Amazonia with the aim of generating exchange through export. Based on this decision, the PND II concentrated on expanding infrastructure, such as transport, energy and communications, as well as the export of some specific products, and, moreover, on investing in the expansion of basic industries located in selected areas of the Amazon region (SUDAM, 1976a).

Amazonia was really understood by the PND II as a "tropical frontier" because of its resources of comparative advantage, which were mainly in the mineral, timber and beef sectors, and also in crops. Irrespective of this understanding, it is important to underline here that the Amazon region was always the centre of attention of the military regime. Indeed, this region, with its overwhelming potential of natural resources, huge areas of uninhabited land and socio-economic vulnerability, was perceived by military governments as a means of rapidly solving a range of social, economic and geopolitical problems. In this context, the governmental emphasis, during the first ten years of the military regime, was channelled towards agribusiness, the rapid expansion of the road network and colonisation projects in the region. While there was a firm belief that cattle ranching would change the Amazonian economy and maximize immediate economic advantages, colonization projects aimed to attract thousands of unemployed migrants, mainly from the Northeast, thus contributing to alleviate social tensions in that region and, at the same time, avoid the exodus from its poor areas to highly-populated Centre-South cities. However, both economic and social objectives were inextricably connected with the geopolitical objective, which was based on the idea of national integration, perfectly crystallised in the slogan "to integrate in order not to forfeit" (Hall, 1991). According to the military governments, the best way to achieve this goal was to productively occupy the vast empty spaces in Amazonia. This means that it had to be populated, which required the construction of a wide road network, the attraction of hundreds of thousands of migrants, and also the generation of economic opportunities.

The key point is that the notion of Amazonia as a resource frontier was taken to an extreme by the PND II, which emphasised the complete transformation of the regional economy through a set of programmes, fiscal incentives and investments; the need to integrate the region with markets; and its contribution to the improvement of the Brazilian trade balance. Although the focus on the economy had changed, the PND II followed the same general directives established in the previous plan, and therefore national integration remained a cornerstone of the Brazilian development strategy. In order to carry out all its objectives simultaneously, development pole strategy was resolutely implemented by the federal government. The rationale behind this decision was in Perroux's pole theory itself, which suggested, as seen in the first section, that economic growth, interregional balance and integration of lagging regions could be achieved through a strategy of decentralised development.

This basic idea provided an appropriate theoretical justification for both the economic objective – an accelerated economic growth – and the geopolitical objective – national integration and occupation of Amazonia – of the military regime (Becker; Egler, 1992; Serra, 2003; Serra; Fernández, 2004). It should be stressed that there was concern with social issues, but they were understood by military governments as a result of economic progress, that is, social benefits would stem from an accelerated economic growth.

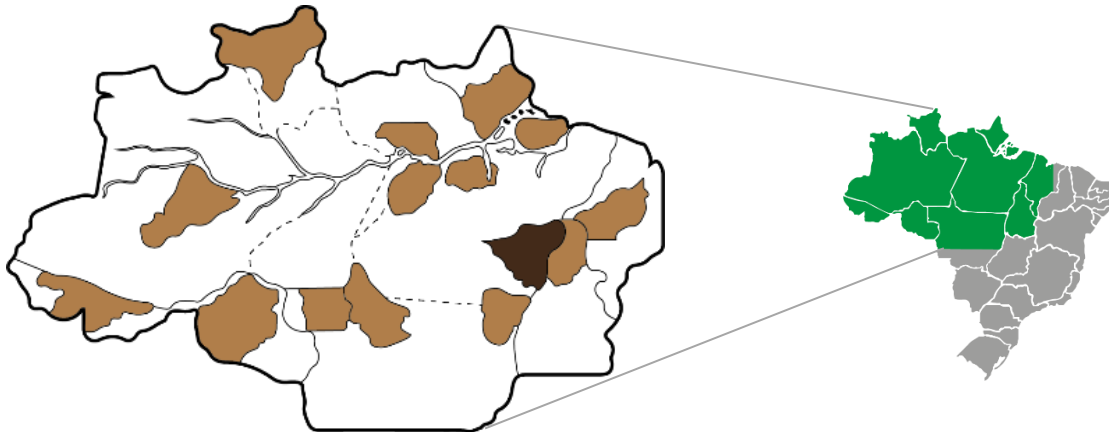
Within this context, the Programme of Agro-Livestock and Agro-Mineral Poles for Amazonia (henceforth Polamazônia) was set up on September 25, 1974 with the clear purpose of creating fifteen development poles throughout Amazonia, which covers 61% of the Brazilian territory (see Figure 2). By choosing these development poles in specific areas in accordance with their potentialities, the federal government did hope to deeply transform the Amazonian economy and boost the productive occupation of the region as well. In this regard, all prospective economic activities in the previously selected development poles – forestry, agro-livestock, agro-industrial, and principally mineral – received heavy investments, estimated at Cr\$4 billion<sup>11</sup>, from Polamazônia (Brasil, 1974). These investments were a precondition for these poles to start their activities. Once set in motion, the Brazilian government expected them to generate the long-awaited beneficial effects for their immediate peripheries and, at the same time, contribute to accelerating the country's economic growth.

Due to its potential for mineral resources in which huge reserves of iron-ore stood out, the Carajás pole (which is in dark brown in the figure below) was a high priority for Polamazônia. Although the mineral activity was the backbone of this development pole, agro-livestock was also deemed important. In addition, forestry exploitation was perceived as promising activity because there was land for this purpose and, moreover, demand for timber in both domestic and international markets (SUDAM, 1976a; 1976b). It is worth highlighting here that the importance of the Carajás pole grew even more in the last military government. Indeed, the economic situation at the end of 1970s had deteriorated, principally because of the second oil shock in 1979, which was a decisive factor in increasing the Brazilian external debt. This was the context in which the federal government launched the PND III (1980-85), which maintained some characteristics of the previous plans but focused on increasing exports in order to decrease the external debt crisis. With respect to Amazonia, the PND III continued to underline the need for national integration and occupation of Amazonia. Therefore, Polamazônia was maintained by the federal government, which considered development poles the best way to achieve its general objectives, that is, to integrate the Amazonia into the national territory and, at the same time, occupy it productively (Brazil, 1979). However, the main point is that there was a shift in the government's focus. This means that cattle-breeding was no longer the best solution for the long-term Amazonian development. The emphasis was therefore placed on the mining sector.

---

(11) This amount is equivalent to approximately US\$ 3.3 billion in 2021. The computation was carried out through the inflation calculator of the Bureau of Labor Statistics.

Figure 2  
Development Poles in the Brazilian Amazon



Source: Authors' elaboration based on SUDAM (1976b).

### 3.2 The Carajás pole

As seen above, the Carajás pole, due to its intrinsic features, was considered the most important among the fifteen development poles selected by Polamazônia programme. Its importance grew even more during the Figueiredo government (1979-85), which placed great trust in the mining sector. The reason for this preference lay in the fact that this sector was responsible for more than 10% of Brazil's export, roughly 1.3% of GDP and about 1% of government revenues in 1980. While some seventy different minerals were produced at that time in the country, iron-ore dominated total national output, accounting for 26% of all mineral production and more than 90% of the value of mineral exports (World Bank, 1992). Moreover, Brazil had considerable reserves of metallic and non-metallic minerals in Eastern Amazonia. It was in this context that the federal government decided not only to carry forward the Carajás iron-ore project, which had been started under the previous administration, but also to establish the Greater Carajás Programme (henceforth PGC).

The PGC covered an area equivalent to 10,6% of Brazil (895,000 km<sup>2</sup>) and larger than France and United Kingdom combined. In fact, this programme comprised four major integrated projects: the Carajás iron-ore project, which was the PGC's backbone and encompassed the mine, a 890km railway (it links the Carajás mine to the Ponta da Madeira terminal in São Luís), a deep-water port and the town site; two aluminium plants (the Albrás-Alunorte and the Alumar); and also the Tucuruí hydroelectric. In addition, the PGC involved investments in agriculture, infrastructure, livestock and forestry (Hall, 1991; Serra & Fernández, 2004). However, the key point is that the federal government hoped that, once several of investments were channelled into infrastructure associated with a wide range of fiscal incentives, further industrial and agribusiness ventures would be attracted to the PGC's seven development poles, which were located along the Carajás railway (Hall, 1991; Serra, 2003; Serra & Fernández, 2004). Another point worth stressing here is that the federal government, through both programmes PGC and Polamazônia, provided a number of incentives and infrastructural investments in order to create favourable conditions for these development poles to generate the hoped-for beneficial spread effects to their peripheral areas and, as a consequence, promote an accelerated economic growth.



The implementation of development poles associated with manifold investments and a variety of fiscal incentives contributed to boosting the Amazonian economy, whose economic performance in the 1970s and 1980s was superior to that of the Brazilian economy as a whole. In these two decades, the GDP of the northern region<sup>12</sup> grew at rates of 12.2% and 6.3% respectively, while that of Brazil grew by 8.3% and 1.9%. Within this context, the industrial GDP of the northern region also performed better than that of Brazil, as it had growth rates of 22% and 4.6% for the 1970s and 1980s respectively, while those of the country were of 11.2% and 0.8% (Maia & Vergolino, 1997). It should be mentioned here that Carajás stood out as a very dynamic region for the Amazonian economy. In looking at this region, it is fully possible to see several positive effects generated by the implementation of the Carajás development pole. For instance, the Carajás project, according to the World Bank (1992), generated at least two or three indirect permanent jobs for each direct employment.

At the peak of its construction activities (1982), that project employed roughly 26,500 workers, of which 24,000 were hired by subcontracting firms and 2,500 were CVRD<sup>13</sup> employees. In 1994, there were 1,599 CVRD employees at the Carajás mine and about 4,800 workers employed by 80 firms outsourced by CVRD (Serra, 1997). This means that all these firms paid taxes, thus providing an increase in municipal revenue, which could be channelled towards the development of the local economy. Moreover, CVRD paid royalties for mineral exploration, which characterises a direct fiscal linkage (Hirschman, 1981; 1992). The municipality of Parauapebas is an illustrative example insofar as it had the third largest income in the state of Pará in 1994 (Serra, 1997). Another important point to be made here is that there was positive effects at the national level. In this regard, CVRD spent approximately US\$980 million in material and equipment that were essential for the Carajás project, but of that amount only 9% (US\$ 90 million) was imported from abroad, while 91% (US\$890 million) was produced in Brazil, mainly by domestic companies located in the Centre-South (World Bank, 1992).

Although Brazilian companies had benefited from the Carajás project, the key point is that goods and services had to be imported from outside the region and this condition makes the Carajás pole an enclave with limited beneficial spread effects for the surrounding region. This aspect leads to another one, which are the reduced multiplier effects in the Carajas region. The weak intersectoral linkages in this region were reinforced by its input-output matrix, which showed that while the national average of the sectoral multiplier is roughly 3,1, the multiplier for Carajás was about 1,2 (World Bank, 1994). In addition to the economic aspect, it should be noted that development poles strategies brought about adverse social and environmental impacts in Amazonia. For example, the Carajás project allied to many other public interventions in that region were responsible for attracting, directly or indirectly, a considerable flow of migrants, which worsened the already deficient infrastructure and service-capabilities of all cities and towns along the Carajás railway (also termed Carajás corridor). Urban areas, to which access was facilitated by the construction of a wide road network, became swollen, and accelerated spatial occupation was crucial not only for predatory exploitation of natural resources, but also for the aggravation of social disparities (Coelho, 1991;

---

(12) Due to the limitation of statistical data in Brazil, the North region is synonymous with Amazonia.

(13) Rio Doce Valley Company. At that time, it was a State-owned mining company and a government agency responsible for the Carajás project and for the PGC.

World Bank, 1992; Serra, 1997; 2003). Despite their attempts to tackle a wide range of problems in their municipalities by improving some facilities, municipal governments were not able to cope with the growing local demand.

#### **4 Summing-up and conclusions**

Particularly in the period between World War II and the 1970s, policymakers in many countries around the world took up the challenge of bringing the concept of the development pole à la Perroux into reality.

In the case of Italy and Brazil, discussed in this article, these policies were aimed at promoting national integration and the development of lagging-behind regions such as the Mezzogiorno and Amazonia. Despite the many differences between the two countries, in both cases the state defined its strategy around two main pillars: public investments in infrastructure and the activity of public enterprises that were supposed to play the role of driving enterprises. In both cases, governments placed great trust in the ability of these two pillars to trigger development processes based on the ability to attract population and new productive activities locally, and to develop upstream and downstream linkages with other activities that would multiply growth opportunities.

In both countries, the poles do not seem to have been able to trigger multiplicative growth processes. Very often, there have been no significant spin-offs of upstream and downstream activities, nor the proliferation of activities complementary to those of the poles hoped for by policymakers. This has happened mainly because many of the driving firms possessed mainly extra-local upstream and downstream ties, which they have maintained over time. The region of establishment, for many of the driving companies, was neither a place where to supply materials or product, nor a place where to develop productive collaborations or to sell products.

For these reasons, scholars' judgment of these poles was for a long time quite negative. Especially in Italy, where spontaneous forms of agglomeration and development such as industrial districts have been particularly important (Becattini, 2004), the policy promoting growth poles has often been perceived as the creation of cathedrals in the desert (Becattini, 1998; Becattini et al., 2003; Asheim, 2000; Hospers et al., 2008). An 'official' evaluation of the growth poles has never been carried out by the Italian State. However, many studies are available that, at various times, have tried to evaluate parts of this long and complex experience (Costa, 1970; Cerrito, 2010), showing that these policies had a modest impact on employment growth at the local level. Sometimes, this modest growth has also come at the expense of neighbouring areas (Andini and De Blasio, 2016). However, in most recent times, the judgment of Italian scholars has become less critical than it was in the past. Many scholars note that some successful industrial establishments were created, which were able to create new jobs in the South, and increase incomes (Cerrito 2010, Adorno, 2015). The presence of large firms in the Mezzogiorno also contributed to the internationalization and the modernisation of the Southern economy and society.

In both countries, growth was the fundamental objective of the creation of the poles, confident that development would come as a consequence. An objective of the poles was also to maintain (for Italy) or attract (for Brazil) the population in lagging-behind areas that were experiencing migration processes towards the richer areas of the country. Indeed, in accordance with development pole theory, a surplus population was a necessary condition for setting in motion the dynamic process of

economic development. Social problems that could emerge with these migratory movements were somehow dismissed, in the idea that social benefits would stem from an accelerated economic growth.

The belief that high rates of economic growth would generate a “trickle-down” effect to benefit the entire population has been unfounded in relation to the Carajás region. In this regard, the attraction of tens of thousands of migrants was a deliberate attempt to make the Carajás pole viable and policy-makers were not worried about the number of migrants attracted to the region, certainly because of the economic objective, but also because of the crude and extremely convenient “trickle-down” assumptions.

The planning for development in Brazil was very technocratic, over-centralised and clearly took priority over the economic aspects. Indeed, it was a top-down process in which even the local needs were determined by the federal government, which did not tolerate any type of pressure, interference or participation by different tiers of government. By centralising every function and by giving priority to the economic aspects, planning fitted in well with the geopolitical and economic objectives of the federal government on the one hand, but was absolutely negligent in relation to the interests of the vast majority of urban and rural populations on the other hand. Therefore, development planning contributed, to a large extent, to the process of social exclusion in Amazonia.

This did not happen in the Italian case. Even if the poles do not seem to have promoted all the growth hoped for, they have temporarily contributed to slowing down the migratory flows towards the north of the country, which had impoverished the social fabric of many regions. According to some, the experience of working in large companies has even helped to modernize the local social fabric (Cerrito, 2010).

In this article, we have focused primarily on the economic development fostered by the poles. Interestingly, in both countries, a debate has recently developed about other types of impacts that the poles have had as well, first and foremost urban and environmental impacts (Adorno, 2015). Especially on the environmental side, the example of the Italian pole is certainly negative. However, it must be recognized that similar examples have also characterized the history of many industrial areas that were not characterized by development poles.

## References

- ADORNO, S. (2015). Le Aree di sviluppo industriale nella costruzione degli spazi regionali del Mezzogiorno. In: SALVATI, M.; SCIOLLA, L. (Ed.). *L'Italia e le sue regioni*. 1. Istituzioni. v.1, p. 375-394. Roma: Istituto dell'Enciclopedia Italiana Treccani.
- ANDINI, M.; DE BLASIO, G. (2016). Local development that money cannot buy: Italy's Contratti di Programma. *Journal of Economic Geography*, v. 16, n. 2, p. 365-393.
- ASHEIM, B. (2019). Industrial districts: the contribution of Marshall and beyond. In: CLARK, G. L.; FELDMAN, M. P.; GERTLER, M. S.; WILLIAMS, K. (Ed.). *The Oxford Handbook of Economic Geography*, p. 413-431.
- BALCONI, M. (1991). *La siderurgia italiana (1945-1990)*. Tra controllo pubblico ed incentivi del mercato. Bologna: Il Mulino.

- BECATTINI, G. (1998). *Distretti industriali e made in Italy*. Le basi socioculturali del nostro sviluppo economico. Torino: Bollati Boringhieri.
- BECATTINI, G. (2004). *Industrial districts: a new approach to industrial change*. Edward Elgar Publishing.
- BECATTINI, M.; BELLANDI, G.; DEI OTTATI, G.; SFORZI, F. (2003). *From industrial districts to local development*. An itinerary of research, Cheltenham, Edward Elgar.
- BECKER, B.; EGLER, C. (1992). *Brazil: a new regional power in the world economy*. Cambridge: Cambridge University Press.
- BERNIS, G. (1990). La dynamique de François Perroux, l'homme, la création collective, le projet humain. In: DENOËL, F. (Ed.). *François Perroux, Lausanne, Suisse: l'Age D'Homme*. p. 99-130.
- BOUDEVILLE, J-R. (1957). Contribution à l'étude des pôles de croissance brésiliens: une industrie motrice – la siderurgie du Minas Gerais. *Cahiers de l'I.S.E.A.*, Série F, n. 10.
- BOUDEVILLE, J-R. (1964). Croissance polarisée du Rio Grande do Sul. *Caravelle*, n. 3. Actes du Colloque sur le Problème des Capitales en Amérique Latine, p. 345-362.
- BOUDEVILLE, J-R. (1966). *Problems of regional economic planning*. Edinburgh: Edinburgh University Press.
- BOUDEVILLE, J-R. (1968). *L'espace et les pôles de croissance*. Paris: Presses Universitaires de France.
- BRASIL. República Federativa do (1974). *II Plano Nacional de Desenvolvimento (1975-79)*. Rio de Janeiro: IBGE.
- BRASIL. República Federativa do (1979). *III Plano Nacional de Desenvolvimento (1980-85)*. Rio de Janeiro: IBGE.
- CAFIERO, S. (2000). *Storia dell'intervento straordinario nel Mezzogiorno, 1950-1993*. Taranto: Lacaita.
- CARNEIRO, D. (2014). Crise e esperança, 1975-1980. In: ABREU, M. de P. (Ed.). *A ordem do progresso: dois séculos de política econômica no Brasil*. Rio de Janeiro: Elsevier, p. 241-262.
- CERRITO, E. (2010). *La politica dei poli di sviluppo nel Mezzogiorno – Elementi per una prospettiva storica* (The policy of growth poles in the Mezzogiorno – Elements for a historical perspective). Bank of Italy Economic History. (Working Paper, n. 3).
- CHAMBRE, H. (1990). Itinéraire économique de François Perroux. In: DENOËL, F. (Ed.). *François Perroux*. Lausanne, Suisse: L'Age D'Homme, p. 130-143.
- COELHO, M. C. (1991). *Socio-economic impacts of the Carajas railroad in Maranhão, Brazil*. Ph.D. Thesis. New York: Syracuse University.
- COSTA, P. (1970). Poli di sviluppo ed economia regionale: un'analisi sistematica degli effetti di propulsione. In: FRANCO, G. (a cura di). *Rendiconti del Comitato per il potenziamento in Venezia degli studi economici*, v. III. Padova: Cedam-Milani.

- D'ANTONE, L. (1995). L'interesse straordinario per il Mezzogiorno (1943-60). *Meridiana*, 24, p. 17-64.
- DE BENEDETTI, A. (2013). *Lo sviluppo sospeso. Il mezzogiorno e l'impresa pubblica, 1948-1973*. Soveria Mannelli: Rubbettino.
- DEL MONTE, A.; GIANNOLA, A. (1978). *Il Mezzogiorno nell'economia italiana*. Bologna: Il Mulino.
- EVANS, P. (1979). *Dependent development: the alliance of multinational, State, and local capital in Brazil*. Princeton, New Jersey: Princeton University Press.
- EVANS, P. (1986). Generalized linkages in industrial development: a reexamination of basic petrochemicals in Brazil. In: FOXLEY, A.; McPHERSON, M.; O'DONNELL, G. (Ed.). *Development, democracy and the art of trespassing: essays in honour of Albert O. Hirschman*. Notre Dame, Indiana: Notre Dame University Press, p. 139-181.
- EVANS, P. (1995). *Embedded autonomy: states, and industrial transformation*. Princeton, New Jersey: Princeton University Press.
- FLORIO, M. (1995). *Large firms, entrepreneurship and regional development policy: "growth poles" in the Mezzogiorno over forty years*. Università degli Studi di Milano. Dipartimento Economia Politica e Aziendale, giugno. (Working Paper, n. 4).
- FURTADO, C. (1994). *Retour a la vision globale de Perroux et Prebisch*. Grenoble: Presses Universitaires de Grenoble.
- FURTADO, C. (1997). *A fantasia organizada*. Tomo I, São Paulo: Paz e Terra.
- GALISI, R. (2014). *Ricostruzione e programmazione nell'intervento straordinario per il Mezzogiorno*. Milano: Franco Angeli.
- GIANNOLA, A. (1979). Imprese a partecipazione statale e industrializzazione del Mezzogiorno. In: GRAZIANI, A.; PUGLIESE, E. (Ed.). *Investimenti e disoccupazione nel Mezzogiorno*. Bologna: Il Mulino.
- GIUNTA, A.; FLORIO, M. (2002). L'esperienza dei contratti di programma: una valutazione a metà percorso. *L'Industria*, v. 23, n. 2, p. 359-396.
- GOMES, G.; VERGOLINO, J. (1997). *Trinta e cinco anos de crescimento econômico na Amazônia (1960/1995)*. Brasília: IPEA. (Texto para Discussão, n. 533).
- GRAZIANI, A. (1973). *Incentivi e investimenti industriali nel Mezzogiorno*. Milano: Franco Angeli.
- HALL, A. (1991). *Developing Amazonia: deforestation and social conflict in Brazil's Carajás Programme*. Manchester: Manchester University Press.
- HALL, P. (1989). Conclusion: the politics of Keynesian ideas. In: HALL, P. (Ed.). *The political power of economic ideas: Keynesianism across nations*. Princeton, New Jersey: Princeton University Press, p. 361-391.
- HANSEN, N. (1967). Development pole theory in a regional context. *Kyklos*, v. 20, n. 4, p. 709-727.

- HANSEN, N. (1968). *French regional planning*. Edinburgh: Edinburgh University Press.
- HIGGINS, B. (1968). The North-South Problem: Italy and Brazil. In: HIGGINS, B. (Ed.). *Economic development: principles, problems and policies*. London: Constable & Company. p. 706-763.
- HIGGINS, B. (1983). From growth poles to systems of interactions in space. *Growth and Change*, v. 14, n. 4, p. 3-13.
- HIGGINS, B. (1988). François Perroux. In: HIGGINS, B.; SAVOIE, D. (Ed.). *Regional economic development: essays in honour of François Perroux*. London: Unwin Hyman, p. 31-47.
- HIGGINS, B.; SAVOIE, D. J. (Ed.). (1988). *Regional economic development: essays in honour of François Perroux*. London: Unwin Hyman.
- HIRSCHMAN, A. (1958). *The strategy of economic development*. New Haven: Yale University Press.
- HIRSCHMAN, A. (1981). A generalized linkage approach to development, with special reference to staples. In: HIRSCHMAN, A. *Essays in trespassing: economics to politics and beyond*. Cambridge: Cambridge University Press, p. 59-97.
- HIRSCHMAN, A. (1992). Linkages in economic development. In: HIRSCHMAN, A. *Rival views of market society and other recent essays*. Cambridge, Massachusetts: Harvard University Press, p. 56-76.
- HOSPERS, G. J.; SAUTET, F.; DESROCHERS, P. (2008). 24 Silicon somewhere: is there a need for cluster policy? *Handbook of research on innovation and clusters: cases and policies*, 2, 430.
- LAGO, L. (2014). A retomada do crescimento e as distorções do “milagre, 1967-1974. In: ABREU, M. de P. (Ed.). *A ordem do progresso: dois séculos de política econômica no Brasil*. Rio de Janeiro: Elsevier, p. 213-239.
- LARA RESENDE, A. (2014). Estabilização e reforma, 1964-1967. In: ABREU, M. de P. (Ed.). *A ordem do progresso: dois séculos de política econômica no Brasil*. Rio de Janeiro: Elsevier, p. 197-211.
- LEPORE, A. (2020). L'evoluzione del divario tra il Nord e il Sud dal dopoguerra a oggi. *Estudios Históricos*, v. XII, n. 23.
- KING, L. J. (1974). Conceptual limitations and data problems in the fashioning of growth pole strategies: the case of Ontario, Canada. *Geoforum*, v. 5, n. 1, p. 61-67.
- KINSEY, J. (1978). The application of growth pole theory in the Aire Metropolitaine Marsellaise. *Geoforum*, v. 9, n. 4-5, p. 245-267.
- MYRDAL, G. (1957). *Economic theory and underdevelopment regions*. London: Duckworth.
- PACE, C. (1969). Il fondamento delle politiche di sviluppo regionale. *Giornale degli Economisti e Annali di Economia*, p. 213-237.
- PARR, J. B. (1999). Growth-pole strategies in regional economic planning: a retrospective view: Part 1. Origins and advocacy. *Urban Studies*, v. 36, n. 7, p. 1195-1215.

- PERROUX, F. (1950). Economic space: Theory and applications. *Quarterly Journal of Economics*, v. 64, n. 1, p. 89-104.
- PERROUX, F. (1955a). Note sur la notion de pôle de croissance. *Economie Appliquée*, n. 1-2, Janvier-Juin.
- PERROUX, F. (1955b). Trois outils d'analyse pour l'étude du sous-développement. *Cahiers de l'ISEA*, Série F, n. 1.
- PERROUX, F. (1969). *L'économie du XX<sup>e</sup> siècle*. Paris: Presses Universitaires de France.
- PERROUX, F. (1991). *L'économie du XX<sup>e</sup> siècle: ouvrage et articles*. Fontaine, France: Presses Universitaires de Grenoble.
- PERROUX, F. (1994). *Pouvoir et économie généralisée*. Textes réunis par Renato Di Ruzza et Pierre Berthaud, France: Presses Universitaires de Grenoble.
- PERROUX, F. (2014). *A new concept of development: basic tenets*. Abingdon, Oxon: Routledge.
- PERROUX, F. (1988a). The pole of development's new place in a general theory of economic activity. In: HIGGINS, B.; SAVOIE, D. (Ed.). *Regional economic development: essays in honour of François Perroux*. London: Unwin Hyman, p. 48-76.
- PERROUX, F. (1988b). Peregrinations of an economist and the choice of his route. In: HIGGINS, B.; SAVOIE, D. (Ed.). *Regional economic development: essays in honour of François Perroux*. London: Unwin Hyman, p. 77-90.
- PESCATORE, G. (2008). *La Cassa per il Mezzogiorno*. Un'esperienza italiana per lo sviluppo. Bologna: Il Mulino.
- PIRRO, F.; GUARINI, A. (2008). *Grande Industria e Mezzogiorno 1996-2007*. Gruppi, settori e filiere trainanti fra declino dei sistemi produttivi locali e rilancio dei poli di sviluppo, Bari: Cacucci
- ROMEO, S. (2019). *L'acciaio in fumo*. L'Ilva di Taranto dal 1945 a oggi. Roma: Donzelli.
- ROSENSTEIN-RODAN, P. N. (1955). Programming in theory and in Italian practice. In MILLIKAN, M. F. (Ed.). *Investment criteria and economic growth*. Cambridge: MIT Press, p. 19-22.
- ROSTOW, W. (1960). *The stages of economic growth: a non-Communist Manifesto*. Cambridge: Cambridge University Press.
- RYDER, A. (1990). Growth pole policy in Poland and the Lenin steel-works. *Geoforum*, v. 21, n. 2, p. 229-244.
- SCHACHTER, G.; SCHACHTER, F. N. (1968). Politiche per lo sviluppo regionale nelle economie aperte: il caso italiano. *Giornale degli Economisti e Annali di Economia*, p. 670-697.
- SERRA, M.; FERNÁNDEZ, R. (2004). Perspectivas de desenvolvimento da Amazônia: motivos para o otimismo e para o pessimism. *Economia e Sociedade*, v. 13, n. 2, p. 107-131.
- SERRA, M. (1997). *The social impacts of regional development policies in Eastern Amazonia: a case study of Parauapebas*. PhD Thesis. London: London School of Economics and Political Science.

SERRA, M. (2003). Development pole theory and the Brazilian Amazon. *Estudos Econômicos*, v. 33, n. 1, p. 1-43.

SUDAM (1976a). *II Plano Nacional de Desenvolvimento da Amazônia: detalhamento do II Plano Nacional de Desenvolvimento (1975-79)*. Belém: SUDAM.

SUDAM (1976b). *POLAMAZÔNIA – Carajás*. Belém: SUDAM.

WORLD BANK (1992). *World Bank approaches to the environment in Brazil: a review of selected projects – The Carajás Iron Ore Project*. Washington D. C.: The World Bank.

WORLD BANK (1994). *O Polo siderúrgico de Carajás: perspectivas, opções energéticas e gestão ambiental. Relatório síntese*. Mimeo.