Coordination Failures, Poverty Traps, "Big Push" Policy and Entrepreneurship: A Critical View

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Abstract

Poverty traps occurs when agents fail to coordinate their actions to achieve the optimal allocation of resources. It is argued that this phenomenon makes economic convergence impossible and keeps agents in a poverty trap from which they cannot escape unless a massive and coordinated industrial policy is implemented. This analysis shows that the literature on coordination failures has overemphasized the significance of market failure. It argues that coordination is possible and profitable in a free market system. State intervention is responsible for the systematic misallocation of resources (discoordination), in general, and for poverty traps in particular.

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1. Introduction

Market failure is the utmost reason for defending an active economic role of the state. Among other market imperfection-based arguments, the theory of coordination failure is widely used at the present by development economists to define a new case for industrial policy (Matsuyama, 1995; Rodrik, 2006).

The central pillar of the literature on coordination failure is the idea that economy can fail to achieve coordination among complementary activities. Coordination failure leads the market to an outcome (equilibrium) inferior to a potential situation where resources would be correctly allocated and all agents would be better off.

The occurrence of these inefficient equilibria or poverty traps is supposed to provide an opportunity for a positive state intervention. It is argued that such situations can be overcome only by massive coordinated investments, something which is unlikely to happen if poor regions are left on their own. As Dercon (2003, p. 5) puts it, "A poverty trap is an equilibrium outcome and a situation from which one cannot emerge without outside help, for example, via a positive windfall to this group, such as by redistribution or aid, or via a fundamental change in the functioning of markets." In a few words, poverty traps can be removed by a "big push" strategy.

This paper intends to provide a refutation of the idea that entrepreneurial coordination problems can lead to poverty traps. In subsidiary, it criticizes the claim that public intervention can improve the coordination of economic agents.

The paper is organized as follows. The next section puts the coordination failure argument in historical perspective. Section three describes the coordination failure argument which pushes the case for industrial policy, with a focus on the relation between coordination problems and poverty traps. Section four explains the role of entrepreneurs in achieving coordination on a free market. Section five criticizes the notion of coordination failure and underscores the weaknesses of "big push" theory, explaining the risks associated with development planning. The last section concludes the paper.

2. Intellectual pedigree: Rosenstein-Rodan, Nurkse, Hirschman

The literature on coordination problems has a long tradition.[1] A pertinent review of the literature on coordination failure can be found in Hoff (2000) and Hoff and Stiglitz (2001). Paul Rosenstein-Rodan, in his seminal 1943 article "Problems of Industrialization of Eastern and South-eastern Europe" argued that poor economies cannot grow because of coordination failure among complementary industries. If industrialization is simultaneously achieved in all economic sectors, industries could end up with profit, even though no sector would be profitable if it chooses to industrialize alone. As a result, an underdevelopment equilibrium was possible. To solve this problem, a large amount of investments are required – the so-called "big push" policy.

In the 1950s, most economists thought that, if left to the impersonal forces of market, underdeveloped economies would never turn into rich and prosperous ones. Ragnar Nurkse (1953) argued that underdevelopment persists because of a so-called "vicious circle of poverty": on the one hand, domestic market is thin because of low incomes and, on the other hand, the supply of goods is scarce exactly because people are too poor to save. Thus, the level of capital accumulation, investment and productivity is low.

The assumption was that free market is unable to direct capital toward the most socially efficient investment projects. Unlike Nurkse, who favoured a uniform industrial policy – the doctrine of "balanced growth", which required a massive investitional effort, i.e. a "big push" – Albert Hirschman (1958) maintained that developing countries lack also managerial and entrepreneurial abilities. Therefore, the optimal policy should have as a goal an unbalanced development, concentrating investments in those sectors with significant external effects, which can facilitate and promote complementary investments in the rest of the economy.

The dissapointing results of state led industrialization and the collapse of central planned economies have convinced most economists to repudiate early development models. However, although "big push" strategies seemed to be definitively expelled from the realm of development economics, recently they have started again to claim the

[1] Graham and Temple (2005) consider that its origins can be traced back to Malthus.

attention of economists. "The big push has returned to favor in the development policy-making, after half a century of exile" (Easterly 2005, p. 3). A good illustration of this change is the adoption of Millenium Development Goals by the U.N. which, claiming that many third world countries are kept in a poverty trap, argued for "a big push of basic investments between now and 2015 in public administration, human capital (nutrition, health, education), and key infrastructure (roads, electricity, ports, water and sanitation, accessible land for affordable housing, environmental management)" (U.N. 2005, p. 19).

"Big push" policy is back in development economics because in the last decades a number of contributions have attempted to refine the case for industrial policy and ground it in a more solid theoretical bedrock. Using rational expectations hypothesis, several authors have atempted to formalize the coordination failure argument and elaborate a multiple equilibria theory of development.

A reference work illustrating the resurgence of interest for coordination problems is Murphy, Shleifer, and Vishny (1989) which formalized some aspects of the Rosenstein-Rodan viewpoint. In addition, other development economists[2] have emphasized a number of situations where interdependence among private agents seems to produce coordination failures that prevent economies from achieving a better equilibrium.

After the publication of Sachs *et al*. (2004), this author has quickly become one of the foremost advocates of "big push" industrial policy of our times. Sachs's influence is phenomenal throughout the world. He is a "guru" of economic development, "spiritual father" of numerous research institutes, initiatives and projects, and advisor for economic development policy in many countries. Economists like Rodrik (1996; 2004) and Rodriguez-Clare (2005a; 2005b) have used this particular market failure argument as justification for a "new industrial policy", the goal of which is to induce entrepreneurs to invest in those projects with the highest social return.

3. From coordination failure to big push policy

[2] See Acemoglu (1997); Adsera and Ray (1997); Azariadis and Drazen (1990); Easterly (2001); Matsuyama, (1991; 1996); and Krugman (1991)

As the coordination externality argument goes, the economy works like an ecosystem:

> "In an ecosystem, a key factor determining how any individual will behave is his environment. One of the most important aspects of that environment is the behavior of others. Under some conditions, ecosystems have multiple equilibria, and individuals may fail to "coordinate" on the equilibrium that is preferred by everyone… The basic mechanics of coordination failure are simple: An individual's behavior – for example, to produce or to prey on the production of others – creates externalities. The externalities affect not only the *welfare* of others, but also their *decisions*. The interaction of the slightly distorted behaviors of many different agents may produce very large distortions and can lead to the existence of multiple equilibria, some very good for every member of the economy, and some very undesirable." (Bowles, Durlauf and Hoff, 2006, p. 6-7)[3]

For Matsuyama (1996, p. 2), this coordination problem, like "the problem of hundreds of people, scattered in a dense, foggy forest, trying to locate one another – is of such fundamental difficulty that no algorithm can solve it. What the economics of coordination tries to show is that even the market mechanism cannot solve the problem."

A good explanation of this market failure is provided by Rodriguez-Clare (2005) and Rodrik (2004). The former author (p. 3) points out the fact that the success or failure of an action depends upon the context in which it is undertaken: "A firm's productivity depends not only on its own efforts and abilities, and on general economic conditions (e.g., the macroeconomic environment and the legal system), but also on the actions of other firms, infrastructure, regulation and other public goods".[4]

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[3] "Whereas neoclassical economics emphasizes the forces pulling toward equilibrium— and with similar forces working in all economies, all should be pulled toward the same equilibrium, modern development economics focuses more on evolutionary processes, complex systems, and chance events that may cause systems to diverge. Thus, it tends to be influenced more by biological than physical models…The economy is like an ecosystem, and Darwin was implicitly recognizing that ecosystems have multiple equilibria. Far more important in determining the evolution of the system than the fundamentals (the weather and geography) are the endogenous variables, the ecological environment. Luck—accidents of history—may play a role in determining that and, thus, in the selection of the equilibrium." (Beyond Rosenstein, p. 14-15)

[4] In such a case, the actions of different agents are "complements".

On a more specific note, Rodrik (pp. 12-13) notes that

> "Many projects require simultaneous, large-scale investments to be made in order to become profitable. […] An individual producer contemplating whether to invest in a greenhouse needs to know that there is an electrical grid he can access nearby, irrigation is available, the logistics and transport networks are in place, qurantine and other public health measures have been taken to protect his plants from his neighbors' pests, and his country has been marketed abroad as a dependable supplier of highquality orchids. All of these services have high fixed costs, and are unlikely to be provided by private entities unless they have an assurance that there will be enough greenhouses to demand their services in the first place. This is a classic coordination problem. […] More generally, coordination failures can arise whenever new industries exhibit scale economies and some of the inputs are non-tradable (or require geographic proximity)."

Put it differently, the coordination problem illustrates the old proverbial chicken and egg dilemma. Agents cannot introduce a new good X on the market because they cannot rely on complementary suppliers of Y and Z but, in turn, suppliers of Y and Z have no reason to produce because there is not enough demand for their output.

As Howitt (2001, pp. 3-4) argues, the coordination effort market participants put depends critically on their expectation that other individuals will act to take full advantage of potential gains from trade: "When people on one side of a market put more effort into the matching process, this makes it more worthwhile for those on the other side to do the same thing, because it makes transacting less costly for them." For example, pessimistic expectations on the part of firms that they can find appropriate workers will make more costly for workers to find suitable jobs. A vicious circle seems to ensue, keeping the market at distance from an efficient allocation of resources.

Following a similar line of reasoning, Marshall (p. 13-14) provides a good explanation of what is meant by coordination failure:

> "Suppose the economic performance of a country (or a firm, industry, or financial market) depends on large numbers of investors being willing to provide

> funds. If it is generally believed that *other* investors will withhold funds, it is rational for any *given* investor to refrain from investing. Thus, these beliefs become self-fulfilling. This represents a coordination failure because *everyone* would be better off if *all* investors provided funds to the affected country. Unfortunately, there is no way to coordinate investor actions in this way."

More precisely, under the circumstances described above, there are multiple equilibria: a good equilibrium, obtained when entrepreneurs have optimistic expectations and thus manage to coordinate their businesses, and a bad equilibrium, resulting from entrepreneurs' reluctance to invest and their failure to coordinate. When the market mechanism does not work, the government should coordinate (stimulate) entrepreneurs into the good equilibrium.

This policy prescription echoes the arguments of Rosenstein-Rodan (1943) and Hirschman (1958) who argued for the necessity of a massive and concentrated industrialization policy ("big push" strategy) in order to break the underdevelopment equilibria. In light of the negative consequences of industrialization policy carried out by many developing countries in the 1960s and 1960s, market failure theorists are cautious, and insist that the solution requires skill rather than resources (Hoff, 2000). Essentially, the government should adopt policies that rein in the spillovers among entrepreneurs, paving the way for the good equilibrium.

4. Alternative perspectives on coordination

The proponents of coordination failure argument provide a very simple definition of coordination. In their view, coordination problems typically arise when "profitable new industries fail to develop unless upstream and downstream investments are coaxed simultaneously" (Rodrik 2004, p. 13). For example, "building an airport in a region that has no hotels would not lead to any traffic, but hotels without a regional airport may not be profitable either" (Rodriguez-Clare, 2005, p. 10).

This view of coordination may be considered as simply a truism. If a successful investment occurs, it is profitable because it is properly integrated into a network of

complementary businesses. Inversely, any investment failure brings a loss because it does not fit in a suitable network of complementary businesses.

The example does not demonstrate that market may fail in coordination; rather, it shows that not all potential activities can be brought in line into a coherent structure of production, and this is the reason for which some activities are not undertaken. Building an airport and hotels may be considered "complements", but there is nothing special about them except the fact that they are two. We could add easily that building hotels, or highways, or museums, or fancy restaurants and shops, or providing ski transportation facilities, or artificial snow, are all complements because they can be used together. But the example does not say anything about how (in what combination), when, and especially if consumers do wish to buy their services. It does not say if consumers prefer to have this set of activities at 10,000 feet altitude or at the sea level. Most importantly, it overlooks the fact that if consumers do have a clear preference for all these (not yet existing) services, then they must stop supporting other alternative activities (farming or mining, for instance).

It should be noticed that any action or policy has coordinating as well as discoordinating effects, and we are left without precise indication about what coordination is better.

Alternatively, we can use the word "coordination" in a different sense. Coordination can be viewed not as a problem of technical complementarity/compatibility between different economic units, or as a problem of synchronization of producers, but as a relation between producers and consumers.

The entire economic system is nothing but a combination of inter-related production processes. An efficient functioning of this social device requires a smooth coordination among its various activities. Because individuals' preferences for various consumption goods alter endlessly, as well as their inter-temporal preferences and the availability of resources, producers need to revise their plans, and the configuration of production is continuously reshaped. Some production processes are dropped while other activities are undertaken. Economic development occurs when this structural change is fueled by capital accumulation and the production structure is widened and deepened.

The market process – that is, voluntary exchanges between individuals within a private property framework – has been considered for a long time an excellent mechanism for achieving spontaneous coordination. Adam Smith described metaphorically the process by which general welfare is enhanced as a result of each individual pursuing his own self-interest, using the expression "as if led by an Invisible Hand." More accurately, Frederic Bastiat pointed out that the interests of all members of society are harmonious, even if they occasionally fail to act in harmony with each other.[5]

However, error is inescapable. It is the result of human limited cognitive abilities (bounded rationality) and a highly complex network of economic relationships. It is optimistic to think that entrepreneurial effort (within the framework of a market order) can manage to overcome all coordination problems. Therefore, the existence of coordination failures cannot be disputed. The very existence of success stories reported by business magazines, the very fact that new entrepreneurs enrich themselves suggests the existence of coordination problems in the first place.

Unfortunately, advocates of "big push" policy are biased in their analysis of market failure and poverty traps. It should be noted that development economists are not interested in analyzing coordination failures *per se*. The allocation of resources changes permanently, and there is a permanent need for recoordination of economic activities. Coordination failures happen everywhere. All regions and all countries are developing. Thus, in terms of coordination, the diference between rich regions (countries) and poor regions (countries) is only a matter of degree. (Matsuyama, 1995) Divergent economic evolutions happen all the time among various regions within every country. But, as Easterly (2006, p. 1) aptly notes, "no serious economist that I know of is proposing a Big Plan to triple US per capita income, or to end poverty in the US." Instead, we hear this argument with reference to different countries. What is of interest is not infra-national coordination failures, but only inter-national coordination failures, and this for purely ideological reasons.

"The economy never reaches a state of full coordination. How close or how far away it is depends on how severe and how recent shocks have been in "wants, resources and technology" – and monetary conditions. The impossibility of perpetual full

[5] See Hülsmann (2001) for a pertinent account of Bastiat's contribution to economics.

coordination is no defect of the market system. It is an inevitable consequence, rather, of the circumstances with which any economic system must cope." (Yeager, p. 226)

5. Entrepreneurship and coordination

No mechanism can help us to achieve the perfect allocation of resources. However, the price mechanism is superior to other alternative means of coordinating economic activities. This verdict is based on the following considerations:

a. rational calculation

First of all, we must emphasize that in a market system coordination is possible because agents have a rational method for selecting what and how production processes should be coordinated. The essential instrument used by entrepreneurs in deciding upon the allocation of resources is monetary calculation.[6] If their undertaking ends with a profit, then it means that resources were brought in line with consumers' needs. If the result is a loss, then inputs were diverted from their optimal employment and wasted into less important activities. Therefore, entrepreneurs have a robust guide for selecting among competing production processes. On a free market, production is rational and coherent, always subordinated to consumers' wishes.

b. Incentives

Again, this is not to say that the free market system manages to achieve a perfect coordination of economic decision-makers. There is still plenty of room left for imperfections, errors and discoordination, and the literature on bounded rationality provides many reasons for these failures. Yet this is a consideration of a different nature. The important fact is that agents have a strong weapon to fight against error. Individuals can use their rationality in choosing among alternative activities, despite any shortcomings that may infect their decision-making process. Investors and producers are stimulated to coordinate their businesses in order to respond to consumption demand. Failure to use resources to satisfy the most urgent consumers' needs is penalized, while success is rewarded.

[6] Mises (1920) pointed out the crucial importance of economic calculation as an indispensable tool for coordinating the complex network of exchanges that constitutes an advanced economy.

"The entrepreneurial element in human action is the force that drives the market system towards a greater level of coordination. This force is unleashed because of the existence of pure profit that necessarily exists in disequilibrium situations." (Sautet, p. 31)

Moreover, the presence of incentives improves the quality of judgment tasks, leading to a reduction of errors. Incentives affect the willingness of individuals to use resources to make optimal decisions.

c. selection

The profit and loss mechanism provides not only powerful incentives for avoiding error but also serves as a test for selecting the most able entrepreneurs. Only competent entrepreneurs pass the market test and are able to continue to produce, and they can stay on business only as long as they manage to demonstrate their abilities over and over again.

The market process effectively coordinates productive efforts because the structure of prices is shaped according to the relative importance of resources for their final users – the consumers.[7] More precisely, by forecasting future market conditions, entrepreneurs bid for resources in an attempt to increase investments in those production processes with the highest expected rate of return, that is, resulting in the output of those goods consumers need most. Thus, because the prices for factors of production are continuously adjusted to the expected prices of final goods, the emerging constellation of prices coordinates the various uses of resources and result in a coherent structure of production.

6. Paternalism and coordination economics

Despite the profession's tradition to use the economics of coordination failure as a base for public policy, a closer analysis suggests we should regard this habit with suspicion. There is still a huge gap between the actual arguments about the necessity of solving coordination failure through government-sponsored mechanisms and the

[7] An excellent description of the coordinative property of the market process can be found in Salerno (1991).

requirements these arguments have to fulfill in order to be considered scientifically valid. In what follows we will present shortly the three main arguments that can be advanced against industrial policy.

a. The information argument

One major problem is the lack of knowledge. Each decision-maker, private or public, possesses only very partial knowledge of the economic scene. The argument echoes the work of Hayek (1937; 1945), that argued that knowledge about economic allocation exists only in a dispersed form among individuals. Each agent do not posses a clear picture of the situation, but only "specific knowledge of time and place." The crucial economic problem is to coordinate these bits of separate information, and this is precisely what the price system can do.

Given that policymakers are not omniscient, they cannot know ex ante the optimal pattern of investments and consequently, are not able to improve the market outcome. This objection stipulates, in a popular and condensed form, that "government cannot pick winners." The history of development policy is full with wrong decisions, which wasted resources into wrong investment projects, creating inefficient industries and social unrest.

b. The incentive argument

This argument is concerned with the lack of incentives for people to conserve/increase the value of resources whenever they do not own (have a property right over) these resources. It maintains that industrial policy is an invitation to corruption and rent-seeking. Once the government is in the business of providing support to firms, the incentives' pattern changes, leading to perverse outcomes. It becomes profitable for private sector to withdraw resources from productive employment and channel them in the competition for political favors. Thus, such an institutional setting leads to a bad equilibrium, being itself a source of coordination failure.

c. The calculation argument

As Boettke and Leeson (2004) and Beaulier and Subrick (2006) show, development economists have to acknowledge the fact that social planners are neither benevolent nor omniscient. However, the free market cannot be defended successfully by pointing out that policymakers do not posses enough information to allocate resources optimally, or by emphasizing the corruptive nature of the state. As mentioned above,

some of the leading advocates of industrial policy acknowledge both these difficulties.[8] But they believe the quality of government's activity can be improved. Therefore, we can accept, for the sake of argument, that perhaps government bureaucrats are both smarter (and better informed) than private entrepreneurs, and well intended. This hypothesis is, of course, completely imaginary, but it should not be dismissed only because it is empirically irrelevant. Government interventionism has to be criticized granted that policymakers are morally and intellectually the best members of society.

In spite of its new clothes, government interventionism has no more solid foundation that it ever had. The problem with industrial policy is deeper than most of its critics admit. Starting with Mises (1990), a large Austrian literature argued that in the absence of private property, money prices cannot emerge and economic calculation is impossible.

As Salerno (1994, p. 112) explained, the market process transforms the qualitative knowledge of various individuals about particular market conditions into quantitative data, i.e. market prices. Without such cardinal values, it is impossible to determine the relative profitability of different production processes, and therefore there is no guide for determining a superior pattern of resources' allocation.

At the limit, in a socialist commonwealth, the central planner has no rational way to decide whether to shift resources from project A to project B. Its intervention is arbitrary because cannot be subjected to the profit and loss test, as private activities are. As Rothbard (1962, p. 825) observed, any punctual decision to socialize investment introduces an island of calculational chaos in the market economy. Promises to bail-out entrepreneurs in case they fail to operate profitably, as Rodrik indicates, amount in a *de facto* socialization of private investments.

The advocates of industrial policy think government can act as private businesses do, using the profit and loss criterion to decide between different investment projects. At this point, Rodriguez-Clare (2005, p. 28) believes that, "at least in principle, one could calculate a social return for such an investment. With limited resources, the obvious approach would be to invest in the proposals that entail the highest social returns. The problem, of course, is that calculating such social returns is very difficult. One (perhaps

[8] See especially Hausmann and Rodrik (2006) and Rodrik (2007).

limited) way to interpret prospective studies is as a way to facilitate this calculation." Here, the author (to his own merit) touches the real problem of industrial policy. The state is not an entrepreneur, so it is not in position to "interpret" prospective studies the same way private individuals do.[9] More precisely, policymakers cannot calculate as private entrepreneurs do. Therefore, their decision is merely a "leap into darkness".

The public allocation of resources raises insurmountable issues. One cannot say whether it is relatively more successful in coordination than the market process based on private property. Nothing prevents *a priori* government-sponsored allocation to result in a better coordination of economic activities in a certain region at a certain point in time. However, there are strong theoretical reasons for which this case is unlikely to happen. Without the possibility of economic calculation, proper incentives and an impersonal selection mechanism of entrepreneurs-coordinators, the discovery of optimal pattern of allocation is almost impossible. On the other hand, a market-based process of coordination includes powerful endogenous forces that *systematically* push the economy toward the best equilibrium.

7. Conclusion

In this paper I have tried to prove that the coordination failure argument does not provide a solid ground for a reshaping of the industrial policy because of its lack of sound theoretical foundation. We have seen that at the root of the argument is a misunderstanding of the role of entrepreneurs in industrial organization. Although the lack of conceptual precision makes the case for industrial policy appealing, coordination analysis cannot be used to improve the allocation of resources above the level reached on a free market. There is no recipe for industrial policy. Government intervention intended to repair the supposed market coordination failure, such us cluster-based targeting and infrastructure development are so widely practiced not because of scientific merit, but for political reasons. Last, but not in the least, the rationale for "big push" initiatives fails to address properly the information, incentives and calculation problems which plague

[9] Rather, as Buss (1999b, p. 367) says, "there are only individual or group interests that use public authority to their benefit, often at the expense of others."

economic policy in general. Thus, numerous pitfalls prevent the "new" industrial policy to be considered a refined ingredient of development economics.

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