



# **Dynamic Efficiency in a Planned Economy: Innovation and Entrepreneurship Without Markets**

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**ABSTRACT:** A common Austrian criticism of socialist economic planning points to its supposed inability to boost the dynamic efficiency of an economy, given that adequate business innovation and efficient social coordination cannot be achieved in the absence of private property and market processes. This conception presents two main failures. On the one hand, it is based on a circular argument: dynamic efficiency requires free exercise of the business function and the market, given that said efficiency is defined as that same business function and market. Besides, new information and communication technologies can mobilize dispersed information without markets. On the other hand, planning is compatible with diverse means of decentralization at the decision-making stage. There are institutional formulas that allow fostering decentralized corporate innovation and entrepreneurship in a framework of social ownership. Thereby, Investment Councils in different branches can be responsible for selecting new business projects from among all the proposals received from entrepreneurs, within an adequate system of incentives.

**KEYWORDS:** socialism, dynamic efficiency, innovation, entrepreneurship, planning

Introduction

**O**NE OF THE MOST COMMON CRITICISMS of socialist economic planning points to its supposed inability to boost the dynamic efficiency of an economy, given that the adequate promotion of business innovation and efficient social coordination

cannot be achieved in the absence of market processes. This criticism was developed mainly by the Austrian School, which argues that only through the free exercise of “entrepreneurship” (defined as the innate capacity of all individuals to detect profit opportunities, thus driving the continuous conception and pursuit of new goals and means) can we generate the information and incentives necessary to perform rational economic calculations and promote dynamic efficiency. According to this approach, any limit on free private entrepreneurship would prevent efficient and rational economic behavior. From this it follows that the organization of a complex economy (with developed divisions of labor) via non-market procedures is impossible, since the planning body would be unable to obtain the necessary information for efficient social coordination. Such an assessment, in the opinion of proponents of the Austrian School, has already been confirmed in practice by the real problems experienced by Soviet-type economies, especially since the 1960s, when the stage of extensive industrialization was elided and the division of labor became increasingly complex.

This criticism, focused on dynamic efficiency, developed from a reinterpretation of the problem of economic calculation by socialist states, carried out by a new generation of Austrian School economists in the 1980s, including Lavoie (1985) and Kirzner (1988). These authors questioned the standard reading of the 1930s debate through its basis in the static assumptions of neoclassical economics (general equilibrium models), where all information is taken as given — a theoretical framework from which the “market socialists” (Lerner, Dickinson, Durbin, Lange) built their responses to a contemporary challenge by Ludwig von Mises.

To answer this criticism of socialist planning, we have divided our article into four parts. In the first section we present the Austrian School’s conception of dynamic efficiency and its view that this is impossible to achieve in the absence of market processes. Second, we examine the critiques of this conception by emphasizing its basis in circular reasoning and arguing that there is no insurmountable problem with information inherent in socialism. Third, we describe, for a socialist economy, the basic features of the decision-making process in production, as well as its relation to problems of agency (incentives). Finally, we present an institutional formula for the promotion



of business innovation and entrepreneurship within a framework of social ownership of the means of production.<sup>1</sup>

Our central thesis in this article is that socialist planning of an economy is not only compatible with dynamic efficiency, but indeed that it constitutes the most favorable institutional framework for its genuine development, freeing dynamic efficiency from the restrictions and distortions imposed by the narrow criterion of profitability, as well as from the uncertainties inherent in markets, and linking more directly to the preferences and real needs of the population.

### *1. Dynamic Efficiency and Market Processes: The Austrian School Perspective*

The concept of economic efficiency alludes to the ability of agents (and, by extension, of the whole of society) to extract the maximum possible benefit from productive resources. In this respect, two dimensions of economic efficiency can be said to coexist: static, related to the adequate management of resources already available, so as to avoid waste (placing the economy on the production-possibility frontier); and dynamic, which seeks to increase the quantity and variety of goods and services through innovation and entrepreneurial creativity (thus shifting the frontier of production possibilities to the right).

On the basis of this distinction, for the Austrian School, the fundamental problem facing a complex economy is not the meeting of its production-possibility frontier (achieving static efficiency) so much as the displacement of those limits as much as possible (ensuring dynamic efficiency) with an eye to satisfying to a larger extent the consumption preferences of the population. In relation to this problem, the Austrian School argues that only the market, as driven by the entrepreneurial actions of individuals, can encourage business creativity and establish efficient economic coordination among all agents. Here we examine that perspective as presented by various prominent authors.

1 We would like to emphasize from the outset that this text is exclusively limited to addressing a “technical” answer to the Austrian critique in the area of dynamic efficiency. Thus, other essential aspects of a socialist economy, such as consumption, workplace participation, cost calculation or income are not approached.



Mises saw the market as a dynamic process driven by human action of a commercial nature, which undertakes the entrepreneurial evaluation of costs and benefits in a context of uncertainty. In his 1949 magnum opus *Human Action*, he wrote:

In order to succeed in business a man does not need a degree from a school of business administration. These schools train the subalterns for routine jobs. They certainly do not train entrepreneurs. An entrepreneur cannot be trained. A man becomes an entrepreneur in seizing an opportunity and filling the gap. (Mises, 1998, 311.)

The speculators and investors expose their own wealth, their own destiny. This fact makes them responsible to the consumers, the ultimate bosses of the capitalist economy. . . . In the market economy it is entrepreneurial action that again and again reshuffles exchange ratios and the allocation of the factors of production. (*Ibid.*, 705, 707.)

In the same line, Friedrich Hayek understood competition as a dynamic process of learning and discovery by agents:

The economic problem of society is thus not merely a problem of how to allocate “given” resources — if “given” is taken to mean given to a single mind which deliberately solves the problem set by these “data.” It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. (Hayek, 1945, 519–520.)

This would require mobilizing “the knowledge of the particular circumstances of time and place” (*ibid.*, 521) of the various agents.

Among more contemporary Austrian School proponents, Israel Kirzner defends a concept of the market “as a competitive–entrepreneurial process of discovery” (Kirzner, 1988, 1).

The modern Austrian perspective decisively draws attention to the manner in which the price system promotes alertness to and the discovery of as yet unknown information (both in regard to existing opportunities for potential gains from trade with existing techniques and in regard to possibilities for innovative processes of production). . . . in the Austrian view of the market, its most important feature is (and was) the dynamic entrepreneurial–competitive discovery process. (*Ibid.*, 4–6.)

Joseph Salerno, meanwhile, highlights the processes of assessment or evaluation carried out by agents, which take the form of entrepreneurial forecasts based on expectations:

This social appraisement process of the market transforms the substantially qualitative knowledge about economic conditions acquired individually and independently by competing entrepreneurs, including their estimates of the incommensurable subjective valuations of individual consumers for the whole array of final goods, into an integrated system of objective exchange ratios for the myriads of original and intermediate factors of production. It is the elements of this coordinated structure of monetary price appraisements for resources in conjunction with appraised future prices of consumer goods which serve as the data in the entrepreneurial profit computations that must underlie a rational allocation of resources. (Salerno, 1994, 112.)

Jesús Huerta de Soto develops Mises' idea of business action as the axis of capitalist functioning, noting that

entrepreneurship consists of the typically human capacity to recognize the opportunities for profit which exist in one's environment. . . each entrepreneurial act generates new information of an unspoken, dispersed, practical, and subjective nature and prompts the actors involved to modify their behavior or discipline themselves in terms of the needs and circumstances of others: it is in this spontaneous, unconscious manner that the bonds which make life in society possible are formed. Also, only entrepreneurship can produce the information necessary for *economic calculation*—understood as any estimation of the outcome of the different courses of action. (Huerta de Soto, 2010, 5.)

According to all these authors, entrepreneurship (*i.e.*, human action of a business nature) is a necessary condition for dynamic efficiency, for the following reasons: 1) it generates new information (in discovering profit opportunities that had previously gone unnoticed) that is subjective (exclusive to each person), practical (created only through the exercise of business action), dispersed (being disseminated through the minds of all human beings), and tacit (being difficult to articulate); 2) it is an essentially creative capacity, to the extent that all social mismatches are reflected in latent opportunities for gain yet to be discovered; 3) it transmits information about the availability of and demand for resources through price signaling; 4) it



has a coordinating nature, disciplining the behavior of agents according to the needs of others; 5) it is competitive, referring to a process of rivalry in order to discover profit opportunities; and 6) business performance is a continuous process that never ceases or exhausts itself, because whenever new information is discovered, the general perception of ends and means by the actors involved will be modified, leading to new imbalances and thus to new business opportunities.

The conclusion that follows is that without free exercise of the entrepreneurial function, as would be the case in a planned economy based on social ownership of the means of production, both economic calculation and dynamic efficiency would be impossible.

## *2. The Marxist Response to the Austrian Design*

**2.1. Circular reasoning.** The first thing to note about the Austrian School's conception of the entrepreneurial function as the engine of dynamic efficiency — and its consequent thesis that dynamic efficiency is impossible under socialism — is that it relies on a purely circular reasoning. It seeks to prove that dynamic efficiency requires the free exercise of the business function and the market, given that said efficiency is based on that same entrepreneurship (or business function) and market. Thus the attainment of dynamic efficiency is defined by the free exercise of the business function, which is taken to affirm that dynamic efficiency necessarily requires the entrepreneurial function. Clearly, this constitutes a logical fallacy.

The entire argument rests on the idea that entrepreneurship guides economic activity in a rational and innovative way, thanks to its ability to detect “profit opportunities” in the “environment.” However, the only environment in which this can be systematically true is, tautologically, an environment based on private property and voluntary exchanges, where each agent survives through business initiatives that are not insured by any institutional device — which is to say, the capitalist market itself. Only where the market and private property are allowed to govern will dynamic efficiency be driven by the entrepreneurial function, understood as the human capacity to seek profit opportunities by designing new products, techniques, and business projects. Absolutely nothing is said about how this innovation might be deployed in another, non-commercial social framework, much less why it would be impossible under socialism, even in a decentralized way, as we shall see.

To say that human action is inherently business-oriented in character is a tautological proposal that presupposes a private commercial-business framework, taking one consequence of a certain economic order (human business action) as its cause. Thus the capitalist social environment is naturalized, and the features of capitalist economies are projected as necessary features for any complex economy. This is an inevitable consequence of methodological individualism (a praxiological version of Mises), which aims to explain social processes by an aggregation of individual behaviors, and this is tautological because those same individual behaviors always occur within a given social context that establishes certain “rules of the game,” which are precisely what needs to be explained. Adherents of the Austrian School claim that agents unceasingly “speculate” and perform “assessments” (Mises), that they are ever “alert” (Kirzner), that they “discover” and “learn” (Hayek), yielding “estimates” and “valuation” (Salerno), or that “they capture opportunities for profit that are in the environment” (Huerta de Soto). However, these are all traits of human action within a capitalist framework, based on private ownership of factors of production and the market as a space for economic interaction.

In short, the entrepreneurship with the attributes cited by the Austrians is only necessary for dynamic efficiency within a capitalist social framework. In a context of private property, and with developed divisions of labor, it is trivially evident that the market and business function would be necessary to calculate costs, to generate and process information, and to coordinate activities and promote innovation — there being no other admitted possibility. None of this challenges socialism as an alternative economic order or says anything about the supposed institutional inconsistency of a planned economy.

*2.2. The problem of information.* Inspired by Hayek’s arguments, the new Austrian critique of socialism developed in the 1980s emphasizes that only the market (thanks to its decentralized structure and price mechanism) is capable of generating and articulating the information necessary for rational calculation and efficient coordination, since this information is essentially subjective in character, dispersed among all individuals, and tacit, by which argument no planning body can acquire it. To this assessment, the following responses may be made.

In the first place, and unlike in the era of the USSR, today it is technically possible to exhaustively *calculate costs* in terms of work (that is, without money), as well as to *balance* and *optimize* a complex

economy with tens of millions of distinct products, all without market processes. Furthermore this can be accomplished more quickly, and with greater flexibility and efficiency, than in a capitalist economy, without short circuits or bottlenecks in the flow of information. Alongside contemporary information and communication technologies, the fundamental tools for such cybernetic and democratic planning of an economy would include *input-output* accounting methodology,<sup>2</sup> both to calculate costs (including the reduction of high-qualification work to average work) and to ensure general balance, while mathematical techniques of *linear programming* would allow for the optimal allocation of resources (Cockshott and Cottrell, 1993; Cockshott, Cottrell and Michaelson, 2009; Cockshott and Nieto, 2017; Laibman, 2011; Castillo, 2018). The exponential increase in computing capacity, big data, the internet of things, and artificial intelligence all serve only to expand the enormous potential of economic planning. Some of these possibilities are already present in the operations of large leading companies in the application of new information technologies (Phillips and Rozworski, 2019; Jablonowski, 2011). Walmart operates as a networked system that connects the “center” in real time with stores, warehouses, and suppliers, all through satellite communication using Radio Frequency Identification (RFID) tagging to track the exact location of any product throughout the supply chain. Amazon makes available to consumers an enormous number of products and thus alters its stocks and makes supply requests to suppliers in real time based on sales, also assigning locations, routes, and warehouses using algorithms. This type of networked business organization, with computerized management of the supply chain, prefigures the type of operation at work in a planned socialist economy aimed at satisfying consumer preferences.

Second, it is not true that the information relevant to rational economic calculation and efficient coordination is subjective in nature, or consequently that no planning body could acquire it. In this regard, the following objections may be raised:

i) From the outset, and as explained above, this assessment is based on a circular argument, defining a rational economic calculation

<sup>2</sup> The input-output methodology registers in a double input table how the outputs of some branches are incorporated as inputs for other branches, expressing thus the matrix of inter-industry relationships in an economy. This methodology makes it possible to deal with many other economic problems, such as calculation of labor values or matrix algebra issues.

based on certain characteristics that it adopts within a commercial framework. Thus commercial forms of economic functioning are projected onto any type of society, to be considered valid (in an ahistorical sense) as the only possible ones. In effect, when productive resources are dispersed among private hands, then by definition the information necessary to calculate costs and coordinate activities arises from and is articulated through commercial interactions among the various owners. Only in relation to this process of commercial interaction can it be said that the necessary information is "subjective" in character, because it is based on the personal valuations that agents perform in order to assign use to their resources.

The entrepreneurial action of individuals as cited by Austrian School authors is to be ever alert in order to capture profit opportunities arising in that dynamic environment. For example, if A possesses many empty industrial spaces, B possesses unused equipment, and C has a "strong desire" to work (insofar as she may otherwise die of hunger), then the coordination among these three productive "factors" can only be established by commercial interaction, through individual acts of sale and purchase, according to the valuations carried out by the respective owners. However, it might perfectly well happen that such coordination never occurs, whether because there are insufficient expectations of profit by the owners of the means of production, or because the general opacity of the economy makes it difficult to know the precise availability of existing resources at any time. In fact there is no instance of mediation or coordination that advises or forces private owners to make determined use of the resources they own.

Now, if these industrial spaces and equipment were owned by the community, then a territorial planning agency could decide to make a specific use of the resources in response to citizen demands. Nothing would prevent the detection of social and economic needs without market processes and competitive price formation. In fact, in a framework of social ownership, the procedures and techniques for generating and processing necessary information (about what, how, where, and how much to produce) would be much more varied (decisions centralized or decentralized, mathematical optimization, investment advice, consumer preferences, etc.) and would involve different actors and levels of decision (national, regional, sectoral, business). Hayek examined the relationship between knowledge, ownership, and decision-making and argued that uncertainty and problems of



fragmented and dispersed knowledge require decentralized movement through the market, as only the market would allow efficient allocation, experimentation, and business creativity. But again, this is a tautology: problems of knowledge and insufficient information are precisely what provoke the market and private production (which react to opacity and uncertainty), also preventing deliberation and collective decision-making processes from taking place. In short, the liberal thesis goes on to say that the market (the system of commercial transactions among individuals) is absolutely essential to efficiently calculate and allocate . . . the market itself! That is to say, an area where resources are already dispersed among different private owners.

ii) Furthermore, the development of robotization and automation of production tends to eliminate any element of tacit or subjective knowledge, progressively overcoming practical knowledge within each company. The tendency of capitalism is to objectify all human knowledge, encoding it into industrial designs and software, as occurs today in so-called “smart factories.”

iii) In addition, genuinely tacit knowledge (in the form of skills, intuitions, or habits) that may continue to subsist despite the increasing technification of production would be mobilized in a socialized economy through the active participation of workers in decision-making, whether at the company level or in planning and coordination bodies. In fact, the full participation of individuals in economic life would allow such knowledge to be mobilized more extensively and efficiently. The liberal vision takes an individualized conception of tacit knowledge, although in fact this is largely social, residing in shared experience (the interaction of members in an organization accumulating more knowledge than the sum of individuals) and transmitting a set of conventions, routines, and social institutions (where each organization has a unique way of generating and articulating knowledge) (Adaman and Devine, 1996; 2002).

Finally, in a planned economy, the preferences and decisions of individuals are taken into account twice: *ex ante*, through democratic selection of major economic and development objectives; and *ex post*, through consumption decisions according to individual preferences. A planned economy with a computerized base would be able to respond automatically and with greater efficiency to any change registered at any point of the productive apparatus, or in the final demand of consumers, since information would be transmitted in real time through the chain of

productive interdependencies, and without adjustment processes being distorted by the uncertainty, expectations, or profitability of companies.

### 3. *The Process of Decision-Making in a Socialist Economy*

*3.1. Institutional and technological conditions of planning.* A democratically planned economy that aspires to be efficient and viable must meet two types of fundamental conditions: the technological, in order to calculate costs, allocate resources, and process information in the absence of market processes; and the institutional, to establish well-regulated bodies and procedures for participation and economic decision-making. Technological solvency and robust institutionality would therefore be the keys for endowing socialist economic operations with a certain automatism that avoids unnecessary bureaucracy and the vagaries of political voluntarism so characteristic of past experiences.

Materialization of these requirements in the design of the planning body would depend on two types of circuits or procedures for general economic coordination that would operate in conjunction, performing different functions:

i) *Procedures of scientific-technical coordination:* essentially mathematical optimization for efficient allocation, based on modern information and communication technologies (big data, artificial intelligence, etc.). One fundamental instrument to this end would be the construction of an input-output super-matrix that brings together all sectoral and business interdependencies in the national economy. On this basis, decisions concerning final consumption by individuals would automatically disseminate, in the aggregate, along the entire supply chain (similar to current practices seen at companies like Amazon).<sup>3</sup>

ii) *Economic decision procedures:* design of an institutional structure for the social control of investment that promotes the launch of new products, technologies, and businesses in a decentralized manner. Here the main bodies would be Investment Councils (ICs), distributed by sectors and regions and responsible for selecting and financing new projects presented by teams of “entrepreneurs.”<sup>4</sup> Faced with the

3 Regarding the components of this technical-scientific circuit, we assume the Cockshott and Cottrell model (1993) and Laibman's iterative procedure (2011).

4 We focus on investment and not on consumption (for which we defend the organization proposed by Cockshott and Cottrell, 1993), because it is the one that has a more direct relationship to dynamic efficiency.

use of information that has been largely “already given,” such as characterized the prior technical procedure, here the approach would be to generate new information (on ends and means) in a decentralized way, through a structure of plural participation involving very diverse actors, and with an adequate system of incentives.

*3.2. Centralization and decentralization.* The fundamental economic problem facing the organization of a complex society (with developed divisions of labor) is how to allocate resources and coordinate activities efficiently (which requires being able to make rational cost calculations) in order to effectively meet the population’s needs and consumption preferences.<sup>5</sup> In the capitalist mode of production, both economic coordination and calculation of costs are spontaneously established by means of the market, based on the particular initiatives of private owners of resources, who individually decide what, where, how, and how much will be produced and invested, always according to profit expectations. This is a highly atomized decision-making process marked by opacity and uncertainty, from which are derived blind operation of activities and a non-conscious form of regulation. Socialism, on the other hand, presupposes the abolition of private ownership of the means of production and the (tendency toward) integration of production into a general economic plan. Thus the obvious question to be posed in such a framework is: who will make the myriad productive decisions around tens of millions of varied goods and services?

From Mises onward, the Austrian School considers that social ownership of the means of production necessarily implies the imposition of a “single will” on economic performance, with a central planning organism where all productive decisions will be made, down to the smallest detail. Thus, in opposition to the decentralization of capitalism, socialism is where “the employment of all factors of production is directed by one agency only. One alone chooses, decides, directs, acts, gives orders. All the rest simply obey orders and instructions” (Mises, 1998, 692). The problem with such a system, according to Mises, is that the planning agency cannot be in a position to know the best uses for all means to achieve the proposed goals, and thus

<sup>5</sup> Solving this problem appropriately would be the required condition (but not enough) to achieve human development, which depends additionally both on democratic participatory institutions in all orders of life and abolition of social servitudes.

to organize the overall social division of labor, since the economic authority cannot be composed of "omniscient and infallible beings."

This is, without a doubt, one of the most characteristic misapprehensions of the critics of communism. The first clarification required here is that economic planning (like social ownership) does not in any way require a single level or instance of decision-making which programs an economy down to the last detail, but rather that the distribution of skills among the numerous areas, levels, and agents (ICs, authorities, businesses, users and consumers, etc.) proves coherent and ensures that the overall decision-making process be organic (Laibman, 2002, 2011; Campbell, 2002; Cockshott and Cottrell, 1993). The planning agency does not make all decisions and need not be omniscient. Economic planning merely constitutes an institutional device that allows the principle of conscious, rational, and democratic control of the global productive process to be operational. As such, the socialist model is the economic basis of self-government in a society in which decisions are made and their implementation conducted by those who are affected, in two fundamental aspects: production (workplace, company, sector, national economy) and territory (locality, region, country).

Based on current information and communication technologies, a democratically planned economy would function as a distributed system, simultaneously centralized and decentralized, not unlike the internet. Such a system would permit the management of information flows in real time, articulating knowledge and local decisions within the framework of a general plan. As a centralized system it would benefit from coherence, with access to all resources and the efficiency to mobilize them quickly toward democratically chosen objectives. As a decentralized system, it could articulate initiative and local knowledge (including autonomous relationships among companies to agree on the specific inputs required in each case) as well as independence from systemic failure (that is, burden sharing so that if a certain component fails, others can continue to operate).

The need for coherent coordination and strategic vision requires centralization, while the need for detailed information and the promotion of free and local initiative require some degree of decentralization. Decisions would be made at one or another level depending on the nature of the decision in question. Thus, decisions that require broad coordination to achieve an optimal result would have to be

sufficiently centralized (to avoid parallel decisions or blind dynamics), while decisions requiring detailed local information and which are free of coordination problems (for example, the variety and specific characteristics of the means of consumption) would necessarily be decentralized. Here decentralization adopts a non-commercial form, because in no case would there be private control over resources or investment.<sup>6</sup> In greater detail:

3.2.1. *Centralized decision-making.* i) Democratically: major development objectives and principal economic magnitudes that determine the pace and direction of social development. These will include: Division of the net product into consumption (the satisfaction of present needs) and investment (improvement of the economy's productive capacity); distribution of the three components of consumption: individual, collective (infrastructures and equipment), and social services (education, health, etc.); and large investment projects, some of which can be decided in the territories.

ii) Technically: optimization of production *via* mathematical techniques of linear programming, information technology, and input-output methodology. In order to balance the economy, results are derived backwards, from a list of final goods and services (determined by companies in a decentralized way) to the gross production requirements (Cockshott and Cottrell, 1993). As the consumption preferences of the population vary, the input-output matrix indicates the new inputs required in each case. Computerized management of inputs and products in a socialist economy would work in a way similar to modern supply-chain managing companies, such as Amazon or Wal-Mart (Phillips and Rozworski, 2019).

3.2.2. *Decentralized decision-making.* i) At the company level: 1) Production plans are drawn up and communicated to the "center" for balance and general optimization of the economy, and for calculation of costs in terms of both direct and indirect work. 2) The variety and characteristics of goods and services are determined here (industrial design and innovation departments determine the type of product — furniture, clothing, appliances, etc. — to be manufactured), eventually

6 In large modern organizations, businesses, and public institutions, decentralized decisions are made in a non-commercial way to organize activities. For example, in a public hospital, management does not decide on every aspect (detailed allocation of resources, medical protocols, etc.); in a capitalist industrial group, decisions around investment and organization of activities are adopted in a multi-level process.

with the support of consumer councils;<sup>7</sup> as regards the means of production, there would be direct communication among companies to determine the specific characteristics of the inputs. 3) Organization of work: management of facilities, promotions, incentives, etc.

ii) Investment Councils. These decide the destination of the investment assigned to each sector or territory, expansions of installed capacity, introduction of new technologies, development of new business projects.

iii) Entrepreneurship (individual or team) for business innovation (see section 4).

In this general process of decision-making, the dynamic issue is that of investment: where it should be dedicated, what criteria should be followed, and who decides. Although quantitatively this may not be the most significant component for an economy's final product, investment is decisive in its ability to determine the rate, quality, and direction of growth. In a capitalist economy, the decision as to how much will be invested — a magnitude determined from the result of infinite individual decisions by capitalists, all guided by profit expectations — is not consciously adopted. In contrast, a socialist economy is characterized precisely by social control over investment. Planned allocation can overcome the “anarchy of production” and orient social development in a rational and democratic way. Unlike in capitalist economies, where companies must expand at all costs if they hope to survive, a planned economy can choose between growth and a steady state without compromising stability, whether in general or in a given sector, when considered convenient by the population, which is furthermore not subject to the blackmail of capital flight, or fear of unemployment.

Investment in a planned economy would be allocated, depending on its nature, by way of three basic procedures:

i) Centralized: corresponds to strategic investments in large development projects, infrastructures, and social services that serve to determine the direction of society.

ii) Technical: automatically adapts the use of installed capacity (consumption of raw materials, energy, semi-finished products, etc.) to the evolution of final demand.

<sup>7</sup> The function of these democratic elected Consumer Councils is to elaborate proposals or recommendations to the consumer goods industries.

iii) Decentralized: through ICs, which undertake changes to the productive structure (new technologies, equipment, and business projects).<sup>8</sup>

*3.3. Management, social ownership, and incentives.* In capitalist economies, the business functions of innovation, organization, and management of activities are not performed by the legal owners of the means of production (the shareholders) but by management boards hired for those purposes. Business activity in capitalism is therefore not necessarily linked to the institution of private property, and the figure of businessperson–entrepreneur differs from that of the capitalist as a provider of financing. It is one thing for managers to make business decisions about a certain productive activity, and quite another thing to own the resources which are being decided upon.

This raises the well-known problem of the relationship between principal and agent: how to persuade a hired manager (agent) to comply with the will and interests of an owner (principal) and not to act according to his or her own advantage. The only way to prevent or limit the divergence of interests is through an adequate system of material incentives that directs the agent, depending on the degree to which it meets certain objectives. The key is to understand that private property is not a condition of efficiency in capitalism, since incentives to managers do not involve the conservation or increase of property. The problem of how to efficiently and responsibly manage resources that are not the property of the agent is in fact common to any complex organization.

In socialism, too, ownership and business management are separate: the community is the principal and, represented by a planning authority, it provides the resources that companies must manage efficiently through democratically elected management personnel. While in capitalism the managers must answer to private owners, in socialism they answer to the planning authority, which establishes the corresponding reward. Incentives might relate the functional ambition of proposed objectives (from the allocation of resources) to the degree of compliance. If management meets the set objectives,

8 Investment cannot be allocated solely by algorithm (for example, in terms of relative differences in consumer demand), because a product may experience low demand due to high expense, caused precisely by low investment, therefore requiring increase. Thus, there exists an irreducible component of human decision-making that cannot be eliminated and must be channeled through Investment and Consumer Councils.

rewards would be distributed among all members of the company (according to criteria that could be decided internally). Regarding material incentives, we must bear in mind that differences in the productive results of companies are likely to respond to factors that depend not on personal will, but on factors such as talent, type of work, technology used, etc. The only area in which a person (or collective) can exert their will is that of effort (Albert, 2003). Whenever possible, remuneration would be made according to improvements to personal records, thus offering incentive to all individuals regardless of their talents or abilities.

According to all of the above, and further admitting that business rivalry has been a condition to ensure dynamic efficiency and the satisfaction of consumer preferences, this would not imply that businesses be necessarily private (that is, economically independent companies, competing to maximize profits and outflank competitors), since other forms of rivalry or competition among productive processes can likewise be simulated in a framework of social ownership. There is no formal impediment in a planned economy to testing alternative methods and techniques of production. Rather, the contrary is true, because such tests would not be limited (as in capitalism) by criteria that are alien to existing technical possibilities (such as profitability, the financial capacity of a company, access to credit, oligopolistic barriers, or uncertainty).

Mises claimed that the most important factor is not the company managers but the capitalists who distribute capital among activities, thus risking their own wealth and thereby ensuring the dedication of resources to the purposes most valued by a population. In a democratic economy, this function is carried out by elected planning and investment bodies, and satisfaction of the population's preferences does not require that resources be private: changes in final demand are processed in real time, to modify the relative supply of goods and services. Both Mises and Hayek argued that collective ownership dilutes the responsibility for investment decisions, which are distributed indiscriminately among multiple agents (authorities, managers, etc.) in such a way that responsibility for errors becomes impossible to assign. But to what mistakes in investment were these authors referring? If the mistake is to allocate resources to activities that are already sufficiently covered, then this is precisely the type of error derived from the anarchic and opaque functioning of markets that socialism



is well-equipped to avoid. If the mistake refers to the possibility of producing a certain good more efficiently, then the possibility of a comprehensive calculation of costs in terms of labor allows for comparison of the efficiency of different technologies (Cockshott and Cottrell, 1993; Cockshott and Nieto, 2017).

#### *4. Innovation and Entrepreneurship in a Planned Economy*

**4.1. Innovation and social property.** Innovation occurs as a result of a long and complex accumulation process of knowledge and creativity, where very rarely is a single individual solely responsible. This is an essentially social process in which a plurality of actors and institutions contribute in very different spheres and circumstances. The Austrian School presents an idealized image of innovation in capitalist economies, attributing it exclusively to the figure of the enterprising entrepreneur — whether in a disruptive sense (Schumpeter), or in a strictly coordinating sense (Kirzner). In fact, the entrepreneurial function develops within specific institutional frameworks and organized structures, both at the micro and macro levels.

In this sense, a socialist economy has significant advantages for developing technological and business innovation, as opposed to a capitalist economy: i) socialism allows for greater and more efficient allocation of resources to R&D&I activities, thanks to centralized control of the surplus and the absence of sumptuous consumption and a rentier population; ii) there are no obstacles (property rights) to the free dissemination of new products and techniques; iii) the equal distribution of resources (which guarantees that no basic needs go unmet) allows for discovery and fuller development of talent, which likewise occurs when work is undertaken through tasks that are more balanced for the majority and less routine; iv) in allocating investment, more information is available and the criteria are more varied than mere expectation of profit; v) social ownership is more inclusive and participatory than capitalist enterprise in terms of generating and mobilizing knowledge (tacit or not) and encouraging innovation; vi) socialism does not impose short-term innovation cycles looking to generate products that can be commercialized in, say, four to six months, as is typical in capitalist economies.

Under these favorable general conditions, the development of innovation in a socialist economy would unfold in three fundamental areas:



- i) *Strategic planning*: this traces the main lines of scientific, technological, and innovation research. Here would enter programs for the development of new technologies and infrastructures, as well as visionary projects that explore eventualities and future scenarios. This sort of research is carried out in universities, scientific academies, technological institutes, and other specialized centers in coordination with the business world. The process would consist in testing different alternative productive projects or techniques in order to verify results, in connection with the companies and sectors being served.
- ii) *Companies*: research, design, and innovation departments.
- iii) *Business entrepreneurship*: individuals and teams put forward proposals in hopes of securing financing.

For any of these three areas, material incentives would exist that reward the degree to which the freely programmed objectives are achieved, in addition to purely social or moral incentives such as social recognition or professional and personal fulfilment. In the next section, we focus on how socialist entrepreneurship — something that the Austrian School considers impossible — would ostensibly work.

4.2. *Ecosystems for innovation and entrepreneurship*. In today's most dynamic capitalist economies, entrepreneurship and business innovation are developed mainly in the so-called innovation ecosystems, which are institutional environments dedicated to promoting symbiotic interaction among the different actors involved in the process of creating and transforming companies and industries. This sort of institutional framework represents the antithesis of the liberal mythology where the individual capitalist–entrepreneur operates in a purely commercial environment, since these ecosystems are based on public institutions and resources as well as procedures that are not strictly mercantile.<sup>9</sup>

An efficient and dynamic socialist economy needs institutional environments capable of fostering and channeling the initiative of individuals with special talents to translate innovative ideas into business projects. It must be clear that an ecosystem of socialist innovation does not substitute for, but instead complements, the innovations developed by particular state institutions and programs (such as the transition to a new source of energy, new materials, etc.) as well

<sup>9</sup> In the case of Spain, think tanks and capitalist consultants openly admit that “there is not enough private capital to invest in new companies, either through individual investment or through venture capital funds” (Price Waterhouse Coopers, 2015, 32).

as innovations taking place in the industrial design departments of businesses.

The actors involved in such an ecosystem are essentially the same as those participating in the equivalent ecosystems of the current capitalist economies. Principal differences would lie in the form of interaction among them (in the absence of mercantile links), their decision-making capacity (since no private property rights adhere), and the types of rules in force (including the incentive system). Among the main actors would be the following:

- Entrepreneurs: individuals or teams who launch ideas in the form of business projects around new products and technologies.
- Platforms for innovation: business incubators and accelerators.
- Financing institutions: in the form of ICs, constituted through public convocation, which manage the funds provided by the planning authority.
- Companies: productive apparatus that receive new ideas.
- Knowledge-generating institutions: universities, technological institutes, Scientific Councils, etc.
- Government and planning authority: the former provides the regulatory framework at the different levels, while the latter ensures the technical coherence of the detailed economic plan.

The challenge for a dynamic socialist economy will be to design an institutional formula that effectively relates the different actors, defining in a precise way the functions and responsibilities of each and establishing an adequate system of incentives. In what follows, we propose certain basic ideas and principles for such an institutional design.

1. First, as mentioned, specific platforms for the development of business innovation would be quite similar to those found in current economies; these are basically of two types:

*Incubators*: these accept projects in the gestation phase (transformation of knowledge into a product) and provide specialized advice, training, and basic infrastructure (spaces, services, etc.) in order to evaluate technical feasibility, relevance to the needs of industry or consumers, the professional caliber of team members, etc.

*Accelerators*: institutions to develop projects or start-ups (emerging companies linked to technological fields) that evaluate their insertion in the productive apparatus. They offer resources, knowledge, and support to entrepreneurs through patronage and facilitation of contact with investors.

2. In the process of the gestation, development, and insertion of a given business project into the productive apparatus (*i.e.*, its incorporation into the detailed economic plan), three types of actors contribute specific functions, skills, and incentives:

i) *Entrepreneurs*: individuals and teams present their proposals to the incubators through public calls. Once selected for funding, they move to the accelerator (development and experimentation) stage. The incentives can be material, in the form of bonuses depending on the success of the project, or in the possibility of developing and directing a personal business project, receiving compensation when that project is definitively integrated into the plan.<sup>10</sup>

ii) *Investment Councils (ICs)*: responsible for financing business projects from funds provided by the plan. There would be a plurality of ICs (representing sectorial branches, clusters, consumers, etc.) that would be constituted by way of public calls, competing to capture the best ideas. The incentive for these ICs are premiums depending on the success of the selected projects once they are integrated into the plan. Thus if an IC proves successful in the projects it has financed, in addition to the corresponding premium, it would in the following year receive an additional allocation of funds to manage; and the opposite would occur in the case of an IC showing poor results, eventually causing its dissolution if minimum goals are not attained.

iii) *Planning Bodies (central or territorial)*: these have two essential functions — on the one hand, to allocate funds to the ICs (through public calls or auctions) and, on the other hand, to process the technical aspects of the incorporation of projects chosen by the ICs into the detailed economic plan. The incentive to act diligently derives from their nature as elected bodies, in such a way that those teams or members that manage badly may be replaced in periodic elections.

In the process described, two fundamental features are worth highlighting. On the one hand, the Planning Body is part of a pluralist structure of actors, instances, and practices meant to foster rivalry within the framework of social ownership. On the other hand, these bodies (at their corresponding levels) are merely technical-administrative agencies for coordination, without the power to decide on the projects to be undertaken; instead they channel information

10 In contemporary economies it is common for entrepreneurs to receive their true incentive in the early stages of project gestation, and not so much in continuing to lead once their project is consolidated.

and coordinate the decentralized decisions of entrepreneurs and ICs. Through this structure, the aim is to achieve greater dynamism, efficiency, and the assumption of responsibility in the process of selecting, financing, and developing innovative ideas, and to involve the greatest number and widest variety of agents in decision-making, all within a well-established framework of competencies and incentives.

3. In order to guide entrepreneurial activity toward the objectives proposed in the plan, as well as to improve business activity, two sorts of practices may be undertaken:

i) *Open innovation*: companies, sectors and branches, industrial clusters, and ministries reveal their concerns and the challenges they face; a competition or open contest is promoted to an Investment Council for the presentation of solutions; investors hire the best entrepreneurs to devise and launch prototypes.

ii) *Spin-offs*: these are business initiatives promoted by members of the scientific community, who base their activity on new processes and products generated from knowledge developed in the academic field. In this way, scientific research is more closely linked with the business world through an improvement in transfer routes (with technology transfer centers located at universities).

4. The institutional formula described in this section seeks to present the clear rules and sufficient incentives that would provide positive results in terms of business innovation. If the quantity and quality of innovation were still found to be unsatisfactory, then more aggressive formulas could be enabled as regards incentives and risk. In our proposal, we have assumed that the funds managed by the ICs would be entirely public, corresponding to amounts determined by the overall plan; however, if deemed appropriate, investment funds could alternatively be established by way of private participation, as from private savings where interest or a premium is paid. Such an alternative formula could of course introduce elements of risk, uncertainty, and income inequality among certain groups of citizens, but we expect that this alone would not have the capacity to alter the general economic operation, and it would not be incompatible with the principles and values of a socialist economy, for the following reasons: 1) The democratic and planned functioning of the economy would not be compromised, since the essential social control over the investment would remain in place (albeit through a less centralized decision-making structure), and social ownership of the means



of production would be maintained at all times. 2) Such a variant would not introduce instability into the system, because the private funds received or borrowed would not have the capacity to create economic fluctuations, much less generalized overcapacity or crises. 3) No exploitation would emerge, since only a single factor of income inequality and dispersion would be introduced (insofar as someone would be gaining income not earned through work); but limitations would be set and, in any case, these would not necessarily be higher than those established to incentivize undesirable work (as marked by physical difficulty, monotony, location in remote areas, etc.).

The disadvantages of this alternate approach in terms of a certain erosion of equity and cooperation might be a reasonable price to pay in order to further stimulate innovation and the efficiency of investments. But even then, should the final result prove less favorable than that registered in capitalist economies (a mere conjecture), we expect that this would not constitute a serious objection by which to reject an entire alternative economic and social order based on desired principles and values such as democracy, freedom, equity, efficiency, and stability.

### *Conclusion*

In this text we have aimed to prove that the Austrian theorem on the impossibility of the dynamic efficiency in socialism is not consistent. The alleged issues on subjective and dispersed information in planned economy are either based on tautological grounds that presuppose a market framework, where by definition the information for economic coordination is dispersed among the different private owners of resources, or on problems that can be solved technically by the state-of-the-art technology (telecommunications, AI and big data). We have explained that planning does not mean that a “single will” decides everything, since it is absolutely compatible with diverse means of decentralization at the decision-making stage. To materialize this idea, we have proposed an institutional formula that allows fostering decentralized corporate innovation and entrepreneurship in a framework of social ownership of resources.

The key aspect is that a part of the national economy investment — complementary to the strategic centralized component — is assigned by Investment Councils in the different branches (with funds



established by the general plan, according to their priorities). These Councils would be responsible for selecting the new entrepreneurship projects among all the proposals received from the entrepreneurs — who have transitory material incentives. Having demonstrated the possibility of dynamic efficiency in a planned economy, we are acknowledging to socialism all its potential to achieve its ultimate goal, that of the free and full development of human capacities.

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