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The Myth of Natural Monopoly: The Case of Railroads

João F. R. Lanza*

Abstract: Amid the major regulatory reforms to increase the competitiveness of the rail market worldwide, it is essential to reflect on the nature of rail transport as an economic activity in order to develop appropriate regulatory policies. In the academy, it is common to treat railroads as "natural monopolies," considered to be a "public benefit." This article will explain the origin of the natural monopoly theory and the illusion that monopolies can be efficiently controlled by regulation and present evidence to show that railways do not constitute natural monopolies.

THE RAILWAY INDUSTRY ACCORDING TO NEOCLASSICAL THEORY

DiLorenzo (1995) writes that conventional (neoclassical) economic theory defines a natural monopoly as a situation in which the high fixed costs necessary to operate a business are a major barrier to entry, making the market work more efficiently served by a single company or a small group of companies. Samuelson (1964) explains:

> Under constant decreasing costs for firms, one or a few companies will expand their production, taking a significant share of the total market.

* João F. R. Lanza (joaorodriques1995@protonmail.com) graduated from Fundação Getulio Vargas with a degree in business management (2021) and is an academic researcher specializing in the economics of rail transportation. Unless otherwise noted, all translations are the author's own.

> We would then end up with (1) a single monopoly firm dominating the entire market; (2) a small group of large firms dominating the market or (3) some form of imperfect competition that is either stable or in an intermittent price war, in a notorious rupture with the perfect competition model, where no firm has control over the prices or the market.

In much of the economic and railroad regulation literature, the railroad sector is described as a natural monopoly due to the large economies of scale it requires and the high costs necessary to build the rail infrastructure. This categorization implies that a single producer can offer transport services at a lower cost than a sector with two or more producers and that the presence of more competitors would be bad for consumers, as in the case of water supply and pipelines. Railroad monopolization is therefore justified to avoid these possible losses of economies of scale and scope for the use of assets (Daychoum 2013; Pinheiro and Ribeiro 2017).

However, according to neoclassical theory, this situation is "unfavorable" to perfectly competitive markets, in which there is an atomized arrangement of companies offering a single homogeneous good. In these arrangements, companies are price takers—that is, they accept the price already established in the market. To maximize their profits, they produce until the marginal revenue of the last unit sold equals that unit's production cost. Thus, under competitive equilibrium conditions, production occurs at the most "efficient" point in the market. In a natural monopoly, the monopolist's demand function is necessarily tilted downward, and the monopolist has total control of demand. The monopolist can charge prices higher than the marginal cost, producing a smaller amount than would be offered to the market in "perfectly" competitive conditions.

Thus, to mitigate the social harms of the monopoly, two solutions are proposed: (1) state regulation of private companies through a governmental regulatory agency and (2) nationalization and direct management of assets by a state-owned company (Durço 2011). In both cases, the conventional analysis recommends that the state manage resources, whether directly or indirectly through regulation. According to the theory, state intervention ensures efficient allocation in the market by fixing the price so that the monopolist behaves like a competitive firm, producing the "optimal" quantity

at which the marginal cost is equal to the selling price, emulating a market in "competitive equilibrium."

THE LIMITATIONS OF CONVENTIONAL THEORY

There seems to be growing discontent with the management model based on strict state regulations (if not nationalization) that prevailed throughout the twentieth century. From the 1980s onward, several governments began to carry out regulatory reforms in the railroad industry, which had been stagnating for decades and losing competitiveness compared to other means of transport. As Durço (2011) writes:

> Currently, there seems to be a worldwide consensus among specialists and regulatory agencies on the need to increase competition in the rail industry and, at the same time, reduce public intervention. On the other hand, there is a broad debate about the right way to promote competition: practicing vertical unbundling or maintaining vertical integration.

The issue of deregulation to "increase competition" is corroborated by Daychoum (2013):

> Currently, the allegation of the impossibility of competition in all segments of industries classically considered natural monopolies is being questioned. Even though that infrastructure still constitutes a monopoly, since its duplication is economically unfeasible, it was found that, depending on the regulatory model adopted, it is possible to operate in a competitive regime some activities of the sector containing a natural monopoly. In other words, through regulation, it is possible to identify the market segments that have competition, but were previously hidden by the notion of natural monopoly.

Several economists admit that deregulation in the rail industry (such as promoted by the 1980 Staggers Rail Act in the United States) was beneficial but do not systematically support it. These authors agree that deregulating the market bring benefits, but they still defend some regulation. Ramos (2015, 49) observes that when talking about antitrust law and regulation of industries said to be natural monopolies, such as the rail industry, it is common to approach the subject in an "interventionist" manner:

> First, we present two opposed theories: Socialism, founded on public ownership of the means of production and centrally planned economies; and Liberalism, founded on private property, free enterprise, and free competition between economic agents. Then, we criticize specific aspects of each of these theories, rejecting the radicalism of both socialism—the state is inefficient in some sectors of the market, which private companies should exploit—and of Liberalism—the free market generates monopolies and cartels that the state must fight. Finally, we present a third theory, interventionism, which would have the great virtue of not being radical, reconciling the other two's supposed qualities. Interventionists recognize the benefits of the free market defended by libertarians, but support socialists by defending the state as an essential regulator of the economy. It is precisely this wrong reasoning that guides antitrust advocates.

A good example of an interventionist solution is vertical unbundling, a regulatory model adopted by the European Union and Australia. In this arrangement, competition between independent railway operators is allowed, because state-controlled monopolies are considered inefficient; however, railway lines remain controlled by the government, for they are considered a natural monopoly. Therefore, any effective criticism of antitrust law and its derivatives should seek to demonstrate the superiority of liberalism over socialism *and* the superiority of liberalism over interventionism, which is a task yet to be accomplished.

AUSTRIAN CRITICS OF NATURAL MONOPOLY THEORY

Austrian economists have a completely different view of monopolies than neoclassical economists. The latter's analysis is based on the search for efficient market allocations, while the former's criticism of this approach illustrates the least-addressed point in the natural monopoly theory: the issue of the freedom of entry and exit (Bastos 2016). The question of how a company obtains a monopoly position, creating an inefficient allocation of economic resources, must be answered.

Also, the evident contradiction among mainstream authors in proposing deregulation to increase competition even though, in theory, competition is unfeasible or undesirable in such a market must be highlighted. This also gives rise to a second question: If state

regulators generate more efficient results than free competition, why would it be necessary to introduce competition in the market?

Armentano (1978) argues that the creation of monopolies may result from government prohibitions on the entry of competitors, a fact even recognized in neoclassical literature, especially in countries where the rail network is managed by a state-owned company. However, it is common to identify "nonlegal barriers to entry" that supposedly limit competition and preserve monopolies and misallocation in the market. In the railroad industry, these can include the capital needed to enter the market (for example, for the construction of infrastructure), the importance of economies of scale to profitability, and the pricing, and differentiation strategies practiced by existing railroad companies (supposedly monopolists).

In response to the first question, the Austrian critique of the natural monopoly theory emphasizes two main points: (1) the perfect competition model that is used as a comparison from which to define monopoly conditions and (2) the role of consumer preferences in the allocation of resources. Finally, in response to the second, Austrians criticize the theory for dismissing the entrepreneurial function and for its assertion that so-called market failures can be corrected by regulated monopolies.

THE CRITIQUE OF THE PERFECT COMPETITION MODEL

The perfect competition model, used as the primary analytical tool for competition, is an abstract model that is practically nonexistent in the real world but applied by most economists (including neoclassicists). Armentano (1978) notes:

> Most economists would agree that pure competition is not actually possible. Some would agree, perhaps reluctantly, that it might not even be desirable or optimal if it could exist (if they agree to this, of course, they must also agree that moving toward pure competition is not necessarily desirable, either). But few economists have noticed or emphasized the fundamental flaw of the purely competitive model: it is not at all a description of competition. Pure competition is a static, equilibrium condition whose very assumptions are such that the competitive process is ruled out by definition. Or to put the matter more charitably, while pure competition may describe the outcome of a particular competitive

> situation, the ultimate result, it does not describe the competitive process that produced that particular outcome. The purely competitive theory is not a theory of competition as such.

Using an unrealistic arrangement as an analysis tool gives rise to the phenomenon known as the nirvana fallacy: comparing the real world with an unrealistic model invites the conclusion, of course, that the whole real world is imperfect. For example, product and price differentiation practices, advertising, and large volumes of capital investment in pursuit of economies of scales are often labeled as monopolistic: none of these practices are possible under "perfectly" competitive conditions, in which all entrepreneurs only follow fixed conditions and prices are determined outside the market. Therefore, all competition in the real world is labeled as monopolistic; and a market such as the railroad industry, in which these practices are essential to business activities—and perfect competition is notoriously impossible—is now labeled as "naturally" monopolistic.

Furthermore, Bastos (2016) points out that there are two inherent contradictions in this model. The first is that every market has at least one price-setting firm: because someone needs to initially set a price, this would classify all markets as imperfect, and by extension the entire competitive process that would lead to perfect competition. The second is that if a market is imperfect because it has imperfect elasticity, consumers are also imperfect because they do not have uniform preferences. It is precisely consumer preferences for certain companies' products and services that promote the prevalence of these in the market and give them what is called market power—the ability to influence price formation.

Therefore, the analytical conclusions obtained through the perfect competition model are not only unrealistic, but patently untrue (Armentano 1978; Machovec 1995). Far from predicting or realistically explaining the functioning of markets and competitive activity, it only describes how far real markets are from the unreal conditions that would exist if there were homogeneous consumers with identical preferences and uniform companies without any differences in size, location, advertising, or products and services.

THE CRITIQUE OF BARRIERS TO ENTRY IN NATURAL MONOPOLIES

Despite the inadequacies of the perfect competition model as a point of reference in identifying natural monopolies, monopolies for railroad operators are commonly promoted under the premise that allowing multiple competitors to enter and the subsequent duplication of infrastructure would be unfeasible or inconvenient for consumers due to the presence of barriers to entry. This argument is often used to promote the arrangement known as unbundling, in which the railroad infrastructure remains a "natural monopoly" of the government (as it is considered), while there is free competition in its use among rail transport services (Pinheiro and Ribeiro 2017). However, the evidence does not support this model due to the countless cases of private rail operators (and other providers of services considered natural monopolies) and the fact that duplication of infrastructure may or may not occur due to demand. In many cases, operators carry out shared operations on the same line through the right of way. As Behling (1938) writes:

> There is scarcely a city in the country that has not experienced competition in one or more utility industries. Six electric light companies were organized in the year 1887 in New York City. Forty-five electric light enterprises had the legal right to operate in Chicago in 1907. Before 1895, Duluth, Minnesota, was served by five electric lighting companies, and Scranton, Pennsylvania, had four in 1906. During the latter part of the nineteenth century, competition was the usual situation in the gas industry in this country. Before 1884, six competing companies were operating in New York City. Competition was common and incredibly persistent in the telephone industry. According to a special report of the Census in 1902, out of 1051 incorporated cities in the United States with a population of more than 4,000 persons, 1002 were provided with telephone facilities. The independent companies had a monopoly in 137 of the cities, the Bell interests had exclusive control over communication by telephone in 414 cities, while the remaining 451, almost half, were receiving duplicated service. Baltimore, Chicago, Cleveland, Columbus, Detroit, Kansas City, Minneapolis, Philadelphia, Pittsburgh, and St. Louis, among the larger cities, had at least two telephone services in 1905.

Like the elasticity of demand for products and services, the issue of duplication of infrastructure and differentiation of products and

services as barriers to entry is also directly related to consumer preferences. As Armentano (1978) explains:

> Actually, the neoclassical theorists have gotten the matter completely and precisely backward. It is because, and only because, consumers find resources satisfactorily allocated that would-be competitors find entry difficult or impossible. Product differentiation, especially differentiation that does raise prices, can only act as a barrier to entry if consumers prefer that differentiation and pay the presumably higher prices associated with, say, new annual auto styles. If consumers do not prefer such differentiation and, instead, reward the firms that change styles *less* often, or not at all, then product differentiation could hardly act as a barrier to competitive entry. Indeed, in the case just postulated, product differentiation would be an open invitation to entry and competition.

The only way to obtain adequate infrastructure that reflects opportunity costs and occurs at appropriate duplication levels is to grant freedom to operators. The imposition of legal restrictions on alleged natural monopoly activities and state monopolization of infrastructure only lead to distortions in the market and the impossibility of economic calculation to price these scarce resources appropriately, leading to their overuse. Therefore, the issue of duplicating infrastructure has the same origin in the formation of monopolies: the imposition of restrictions on competitive activities.

Demsetz (1982) also approaches the question of barriers to entry, mentioning how conventional economic discussions fail for being based on explanations of monopoly that are not directly provided by the perfect competition model. Once in perfect competition, prices are equal to marginal costs. The presence of prices higher than marginal costs, or higher rates of return, has come to be seen as an indicator of barriers to entry, especially in industries with a higher degree of concentration. As Demsetz demonstrates, this analysis fails, for most of the barriers to entry that neoclassical economists identify do not meet the necessary criteria of limiting the industry's effective functioning.

A good example is the resources necessary for the construction of a railway line. If these resources are available in a free market, there are no barriers to entry despite many companies' inability to build a railway line. The fact that not every company can build a line does not imply that there is no competition or the possibility of

entering this market. As DiLorenzo observes (1996), the possibility of new competitors even in an industry with a low number of firms is *potential competition*, that is, competition that has not been established yet, which with freedom of entry makes a monopoly unfeasible in the free market. Pindyck and Rubinfeld (2002) also come to this conclusion with their concept of a *disputable market*, which can be competitive despite the presence of even only one firm, because that company is susceptible to new competitors.

Another barrier to entry that is often mentioned is marketing and product differentiation expenditures and investments in fixed assets necessary to gain consumers' loyalty. Consumers tend to be more loyal to established brands. Advertising expenses tend to be important in industries that involve more information about the product or service, and fixed assets are essential in industries that involve many resources (also called sunk costs), such as physical infrastructure. However, as Armentano (1978) stated, these expenses only constitute barriers to entry if consumers reward some companies to cover their costs with advertising and economies of scale.

Let us consider an investment such as a railway line, fixed infrastructure whose creation is often considered a barrier to the entry of other companies in this market. In a genuine free market, competition can be "increased" if consumers indicate a preference to pay higher prices to finance the costs of other firms in building new tracks. The fact that consumers usually do not do this means they consider resources well allocated in the market. The neoclassical economist's vision of an "optimal" allocation under perfectly competitive conditions is frustrated by this situation, not the resource allocation of a consumer´s perspective.

Also, Demsetz (1982) affirms, the cost of building a reputation in the market (i.e., through advertising and infrastructure) is an asset for companies and consumers, because information is not perfect and free. If the need to build fixed infrastructure reduces competition, then competition can be increased by promoting duplicate infrastructure by law, or by forcing the builder to give competitors free access to his infrastructure. Mainstream economists often consider the first absurd due to its unfeasibility in several cases; the latter is commonly promoted in countries that have adopted vertical unbundling, which discourages private companies from building

railway lines, making it necessary for a state-owned enterprise to provide this infrastructure.

Moreover, if advertising and product differentiation reduce competition, more competition can be achieved by limiting these practices by law. Especially in the rail transport market, in which competition rarely occurs between equal products and services, prohibiting differentiation and the production of unique services means prohibiting the essence of competition between companies to serve customers better. Therefore, taking the barriers to entry theory seriously and condemning the practices above as barriers to entry and sources of monopoly power is to condemn consumer preferences in the name of consumer welfare.

Finally, natural monopoly theorists often do not consider substitute products and services to the "monopolized" one. According to Daychoum (2013), the government should create monopolies in the rail industry to prevent the inconvenience of infrastructure duplication, decrease enterprises' returns rate to what would occur in a free competition environment, and preserve the rates of return of the monopolist firm. However, Paranaíba (2016) observes that if governments wish to take seriously the creation of monopolies to protect a monopolist railway, they should prohibit not only the entry of competing railways, but also every potential substitute service, such as trucks, buses, and airplanes on similar routes and, in the case of subways, even cars and walking. That the railways provide one of the most substitutable services compared to water, electricity, and gas services, the consideration of substitute services should make it the "least monopolist" of the "natural monopolies."

THE CASE OF THE MISSING ENTREPRENEUR AND THE CHIMERA OF PRICES WITHOUT MARKETS

Finally, in response to the second question, one can criticize the progressive abandonment of the entrepreneur's role in modern economic theory due to the adoption of market equilibrium models. The structural error in the modern formalist analysis is to establish parametric prices that producers cannot change and that thus are independent of the market structure. Therefore, if in neoclassical

competition theory prices are "given" and companies only "take" prices, the entire price formation process—the most essential part of the competitive process—is alien to the model. As Machovec (1995, 20) notes:

> In neoclassical economics, the what-to-produce question is not an issue: perfect knowledge, market-clearing prices, and the Lagrangian optimality calculus combine to ensure the utility-maximizing mix of goods is produced at every instant…. When the notion of the economic problem was transformed from defining output to allocating output, the role of economists changed—from an analyst of the public and private avenues traveled by the agents in their quest for knowledge—to a builder of models to ascertain equilibrium conditions associated to various initial conditions. The entrepreneur is indispensable in the former scenario but is nonexistent in the latter; therefore, our habits of thought were altered as our conceptual framework was rebuilt under the perfect-information models of the neoclassical era.

Even when adopting more modern models such as imperfect knowledge, neoclassical theory cannot address the real uncertainty in the market: what to look for and where. As a result, obtaining efficient allocations in the market has become a purely technical problem, totally separate from the institutional issue. In the case of natural monopolies, we now have economists proposing that the government regulate the market, seeking to emulate the conditions of a purely competitive market by forcing companies to produce until the marginal cost equals the selling price.

However, Hayek ([1964] 1967) asks how firms would know which prices and costs will prevail in "competitive conditions" if the competitive process to discover them were blocked by regulation. After all, to say that there was an increase in prices and a reduction in output, it is necessary to affirm that there was an increase *in relation to a past price* and a reduction *in relation to a previous output*. At this point, neoclassical economists make a gross conceptual error: if prices and costs were given automatically and independently of business activities, it would be possible to dispense with the price system, private property, and freedom of decision necessary for competition to occur, but these are necessary because entrepreneurs cannot automatically gather information about prices and costs in the market. As Mises (1990, 460) explains:

> Prices are a market phenomenon. They are generated by the market process and are an essential part of the market economy. There are no prices outside the market economy. Prices cannot be manufactured as if they were a synthetic product. They result from a particular constellation of circumstances, actions, and reactions of the members of a market society…. Behind the efforts to determine prices without markets is the confused and contradictory notion of real costs. If costs were real, that is, an amount independent of personal value judgments, it would be possible for an impartial arbitrator to determine their value and, consequently, the correct price. There is no need to dwell on the absurdity contained in the idea. Cost is a valuation phenomenon…. It cannot be defined without reference to valuation. It is a phenomenon of valuation and has no direct relationship with physical phenomena or of any nature in the outside world…. The same applies to monopoly prices. It is very convenient that policies that may result in monopoly prices are determined by pro-monopoly government policies, or whether they are due to the absence of such policies, no "investigation" or academic speculation is in a position to discover what the price would be at which demand would match supply. The failure of all attempts to find a solution to limited space monopolies, as in the case of public service, clearly proves this truth.

Hayek (1944) makes several criticisms of the proposal that a central planner can "monitor" a regulated monopoly to obtain competitive market results. Central planners charge consumers with a "cost-plus" pricing strategy that adds the cost of the service and a "normal rate of return" to capital assets. This method, of course, presupposes that there is a "fixed cost" that can be determined in advance and a "fixed rate of return" independent of market fluctuations.

This happens because mainstream analysis overwhelmingly focuses on market equilibria and efficient allocations without considering how the market achieves these conditions. Natural monopoly theorists suppose the solution to the market's allocative problem is already known and that they have at their disposal all the necessary information about the market. As Hayek argues, this approach misunderstands the function of competition as a process and prices as transmitters of value and information in the market.

Hayek argues that such an approach evades the question that a theory of competition is supposed to answer. There is no way to know in advance the "competitive" prices and costs involved and then expect competition to set them in a predicted level. Instead, competition's

real function is to coordinate knowledge between economic actors to discover prices and costs involved in market activity, not to be a perfect state where prices and costs reflect all information.

Furthermore, regulation brings other problems to the functioning of a regulated industry. Essentially, the regulator's role is to prevent uncontrolled rises in prices, establishing a limit to the prices monopolist firms can charge. On the other hand, it is also necessary to guarantee a "fair" return on assets for the regulated companies, to make them stay on the market.

The first problem is attacked with Price Cap and Revenue Cap methods, while the second, with rate of return regulations. Price cap regulation consists of establishing a "cap" on the prices that utility companies can charge consumers to promote cost reduction. It has become common in North American railway regulation after the Staggers Act in 1980. It is also common to set price "floors" to discourage companies from lowering their rates to "predatory" levels to undercut rivals.

Despite being considered a more efficient regulation method, price caps can discourage investments in unattractive services within price limits, causing quality and service problems. As Rothbard (1962) argues, price limits distort resource allocations in the market: artificially low prices create an artificial shortage of the utility; artificially high prices impose restrictions and a monopoly price on consumers. It can also discourage efficiency in the regulated industry: more efficient firms that could eventually enter the market offering lower prices—or even an existing firm willing to do so—will be considered "predatory" toward their competitors. Finally, price cap and revenue cap regulations can discourage firms from adding new clients and increasing sales regardless of the benefits to society. They probably will be criticized for not practicing the "fair" prices established by politicians and regulators.

Rate of return regulation (which was the most common utility regulation in the United States during the twentieth century) produced a tendency to overcapitalize in public utility markets. Averch and Johnson (1962) first described this phenomenon, later called the Averch-Johnson effect. The guarantee of a "normal rate of return" promotes inefficiency, because firms are exempted from market forces by a guaranteed return on their assets. Also, it encourages the

excessive accumulation of capital goods to maximize profits, given that the costs of adding useless capital are offset by government adjustments of the rates consumers pay. McKenzie (2017) observes a notable example of overcapitalization in railroads' acquisition of large amounts of rolling stock (locomotives and railcars) beyond what is necessary for operations.

In addition to the problems mentioned above, for the governmental solutions to be viable, it is necessary to believe: (1) that the regulator is perfectly well intentioned and (2) the regulated company does not react to regulation. The Chicago school, and especially George Stigler (1971), studied this theme—"regulatory capture"—which occurs when a regulatory agency supposedly created to defend the public interest ends up acting in the interests of the regulated industry.

Regulatory capture occurs (or is very likely to occur) for three main reasons: (1) regulated companies tend to be fewer in number and more influential than the supposed beneficiaries of regulation, generally more dispersed and larger in number; (2) information asymmetry between regulators and regulated; and (3) conflicts of interest among regulators. After all, it is common for companies to have more specialized knowledge about their cost and revenue structures than external regulators (especially if there are political and nontechnical indications). Also, conflicts of interest arise among regulators when affiliates of the regulated firms are in the regulatory agencies, as in the case of the Brazilian ANP (Agência Nacional de Petróleo), which is staffed mostly by former Petrobras technicians.

Regulated companies can take advantage of regulators in several ways, such as setting import quotas, giving away subsidies, or banning new entrants. A famous example in the railroad industry was the pressure from companies to have the Interstate Commerce Commission restrict the entry of truckers into the transport market, as well as place weight, size, and height limits on road vehicles. These measures contributed to the delay in the development of the trucking industry in the United States in the twentieth century, postponing the competition of trucks against the low-density rail branches in the 1960s and 1970s.

The idea that the government should regulate markets to obtain more efficient allocations starts (or should start) with the premise

that interventions generate better results than free competition. This reasoning, according to Bastos (2016), is based on a methodological semi-individualism that defines the market as imperfect because the agents that act in it are imperfect and self-interested. So, the problem of monopoly originates in the profit-maximizing entrepreneur. On the other hand, these problems do not exist in the government: regulators are immune to incentives—especially the perverse ones—and can gather all the information necessary to regulate the market and promote the best allocation of resources.

AUSTRIAN MONOPOLY THEORY

As noted above, neoclassical monopoly theory cannot create an adequate depiction of real-world phenomena. Austrian theory approaches monopoly differently, emphasizing its origins and how it affects consumer sovereignty and resource allocations in the market. Furthermore, Austrians do not treat it as necessarily harmful to consumers, but as a market phenomenon. Mises (1990, 434) describes it as follows:

> We must not confuse the notions of monopoly and monopolistic prices. Simple monopoly itself is catalytically unimportant, if it does not result in monopoly prices. Monopoly prices are important because they result from a commercial conduct that challenges the supremacy of consumers and replaces the public's interest with the monopolist's private interests…. Prejudices of a political nature have overshadowed the discussion of the monopoly problem, preventing attention to more essential aspects.

The main problem Austrian economists analyze is not the predominance of certain companies in the market nor the prices charged in relation to marginal costs, but how entrepreneurs achieve market prevalence and whether this condition is due to consumer preferences or not. In general, three situations often considered to yield monopolies: (1) unique product, (2) limited space, and (3) state restrictions on free competition.

The first case—the monopoly of unique products—happens in a market where producers offer very different or even unique goods or services, in an arrangement often described in neoclassical literature as monopolistic competition (Mankiw 2018). This type of "competition

for unique goods" is prevalent in service-based industries, as companies seek to offer customized solutions to consumers, and it is particularly inevitable in the railroad industry, given the practical impossibility of two or more companies offering service on identical rail lines. However, this phenomenon is not considered a monopolistic threat or a barrier to competition. According to Kirzner (1973), the manufacturer of a single product is always subject to the competitive process due to the possibility of entry by other entrepreneurs and similar products, in what is called a disputable market. Also, Hayek (1948, 97) says that in most markets—including the railway industry—the existence of identical goods and services would be meaningless. In his words, "the function of competition is here precisely to teach us who will serve us well."

The issue of the single-product monopoly, although coherent in several cases, makes no practical sense, as it is very broad and comprehensive. Hayek (1948) says that the error of this conception is that the goal of free competition is precisely to offer different products and services to consumers with different needs, and that homogeneous products are of little use in most markets, such as railroads, hotels, clothing, and books. Furthermore, Rothbard (1962) argues that any difference between two goods perceived by consumers can make them unique (specific) and, by definition, monopolistic. Ultimately, every entrepreneur can be considered a monopolist of his own goods; after all, each individual has exclusive control of his intellectual property.

The second case—the limited space monopoly—occurs, for example, in the operation of local railroad lines in small cities. The low demand in these regions makes them unattractive to many competitors, allowing one or a few firms to corner the market. However, this type of monopoly suffers the same specificity and applicability problems as the previous one, since almost any firm can be considered monopolistic in a given area. As Rothbard (1993, 619) writes:

> First, this "limited space monopoly" is just one case where only one company is profitable in a given area. The number of profitable companies in any production segment is an institutional issue. It depends on concrete data such as the level of consumer demand, the type of product sold, the physical productivity of the processes, the supply and pricing of the factors of production, the forecast of entrepreneurs, etc. Spatial limitations are often of little importance; look at grocery

> stores: spatial limits can allow only the smallest of "monopolies"—the monopoly over the sidewalk portion of the vendor's property. On the other hand, there may be situations where only one company is viable in the industry. But we have seen that this is irrelevant; "Monopoly" is a meaningless term, unless monopoly prices are reached, and, again, there is no way to determine whether the price charged for the good is a "monopoly price" or not.

The second problem with this definition of monopoly is that, in an unobstructed market, any fluctuations in demand or consumers' dissatisfaction with the prices and services offered by a company may attract other competitors. The possibility of competitive markets with a single company is recognized even in the neoclassical literature. For example, Mankiw (2018) and Pindyck and Rubinfeld (2002) claim that even these unique companies can be threatened by new competition in the absence of legal barriers to entry. As in the case of single-product monopolies, consumers can "increase" competition at any time by signaling their preferences for the services of other companies, and the fact that they often do not indicates that they consider the resources to be allocated efficiently. In the words of Armentano (1978), "Again, it is the economist's vision of the purely competitive wonderland that is upset by the large, efficient firm, and not allocative efficiency from a consumer perspective."

Finally, the third definition of monopoly consists of a governmental privilege granted to a company (or group of companies) that restricts production and sales in free competition. Rothbard (1962) considers this definition the only one incompatible with a free market environment, since the entry of new competitors is prohibited by the state and it is possible to achieve monopoly prices incompatible with those that would appear in a free market. Because it is the only definition in which competitive activity and consumers' free choice are effectively blocked by a factor exogenous to the market mechanism, this the most widely accepted definition of monopoly among Austrian school supporters.

THE EVIDENCE OF AUSTRIAN MONOPOLY THEORY

Although the mainstream argues that antitrust legislation and its derivatives are essential to guarantee free competition—in other words, to ensure the free market's protection against eventual

monopolies arising in the same market environment—its origin is unclear. Austrian authors' criticisms of antitrust legislation focus on the fact that this regulatory apparatus was not created for economic reasons but political reasons and that its adoption in the economic sciences only occurred decades later, with the formalization of the discipline and its adoption of equilibrium models. In the words of DiLorenzo (1996):

> It is a myth that natural-monopoly theory was developed first by economists and then used by legislators to "justify" franchise monopolies. The truth is that the monopolies were created decades before the theory was formalized by intervention-minded economists, who then used the theory as an *ex-post* rationale for government intervention. When the first government franchise monopolies were being granted, the large majority of economists understood that large-scale, capital-intensive production did not lead to monopoly, but was an absolutely desirable aspect of the competitive process.

The idea that railway companies—like most companies providing so-called public services—were "monopolistic" dates back to the antitrust movement that emerged in the United States in the second half of the nineteenth century. The antitrust movement, whose primary focus was to create a regulatory agency to control the "abuses" practiced by these public utilities, received little support from economists at the time. As DiLorenzo (1985) describes in "The Origins of the Antitrust Movement: An Interest-Group Perspective," the implementation of antitrust legislation did not reflect the opinion of economists at the time: the adoption of the antitrust apparatus for correcting supposed market failures only became popular among them with the adoption of the purely competitive model, in which the vast majority of competitive practices turned out to be considered potential sources of monopoly power.

The lack of support among economists for the view of railroads as monopolies is explained, for example, by the fall of rail freight prices at a faster rate than average prices and the expansion of railways at a pace much faster than the market average. Besides, the railway sector was not experiencing any concentration in the hands of a few companies, unlike the inevitable concentration and emergence of monopolies commonly pointed out by the mainstream scholars. As Kolko (1970) observes:

> [B]etween 1900 and 1907, the peak year, the number of operating railroad companies increased from 1,224 to 1,564, although there were 874 independent branches in 1900, and that number declined to 829 in the following decade. When all lines are counted, it is the diffusion, not the concentration of the North American rail system, that is the most significant factor in the political behavior of the leading railroad companies.

As many economists of the time had a dynamic view of the competitive process, they did not consider trusts and capital-intensive production in sectors such as railways as threats to free competition, but as a regular aspect of the evolution of competitive markets. On the contrary, the conception that railway companies were abusing their market power was not created by economists, but by rural and industrial producers in these markets, who considered unfair the discounts given to their most efficient competitors. The fact that trusts significantly reduce the prices of products for the final consumer was even recognized by the antitrust supporter Congressman William Mason:

> Trusts made products cheap, have reduced prices; but if the price of oil, for instance, were reduced to one cent a barrel, it would not right the wrong done to the people of this country by the trusts, which have destroyed legitimate competition and driven honest men from legitimate business enterprises. (DiLorenzo 1998)

Therefore, one can conclude that the idea that trusts exploited consumers did not come from consumers, but from the competitors of these companies that suffered in the face of successive price drops. However, the mistaken idea that these successful entrepreneurs exploited consumers persists—and it is still common to call businessmen like Cornelius Vanderbilt and James Hill "robber barons." This notion originates in the fact that although some entrepreneurs were successful in the market due to their business strategies, others, such as Consolidated Gas Company of Maryland, were successful because of political privileges obtained to create a monopoly in their region.

In *The Road to Serfdom*, Hayek (2001) explores the rise of monopolies in the utility industries, describing an evident contradiction in the argument that the market economy produces monopolies. If it is true that the market produces monopolies, they should have appeared

in countries that industrialized earlier and in more developed economies, such as the United Kingdom. In contrast, monopolies in industries such as railways, gas, and electricity arose in countries that were relatively young in terms of industrialization: the United States and Germany. Although in the UK monopolies were created by protectionist laws, in the US and Germany, they were deliberately promoted by the government as part of the realpolitik about fifty years before the UK tested these policies.

In *How Capitalism Saved America: The Untold Story of Our Country*, DiLorenzo (2004) differentiates market entrepreneurs from political entrepreneurs based on how they obtain wealth: while the former serve consumers in the market and thrive on their preference, the latter operate through political privileges. In the railway sector, the most prominent case is that of the transcontinental railways built in the United States in the second half of the nineteenth century, most of them with government subsidies. In addition to several land plots, companies interested in building transcontinental lines could receive subsidies of $16,000 per mile of track built on flat terrain, $32,000 per mile on sloping terrain, and $48,000 per mile on mountainous terrain. (DiLorenzo 2004, 116)

The most common (and obvious) consequence of subsidizing railway undertakings by track mileage built was to encourage beneficiary companies such as Union Pacific and Central Pacific Railroads to build winding routes to receive more funds and pocket the difference between the subsidies and the actual cost of construction. In the long run, cheap construction in poor locations meant that companies often had maintenance costs that were higher than the subsidies earned (about $50,000 in the first year after construction alone), besides the need for further adjustments to ensure good operation. Only seven years after the famous meeting of the Union Pacific and Central Pacific lines at Promontory, Utah, on May 10, 1869, the entire rail layout had to be redone, a rework that took more than five years.

In fact, all the US transcontinental companies went bankrupt a few years after completing their rail networks except the Great Northern Railway, owned by the entrepreneur James Hill. However, the evil practices of other companies that received government subsidies contributed to spreading the mistaken image of railway

sector entrepreneurs as corrupt exploiters of political benefits. Furthermore, the 1887 Interstate Commerce Act's ban on tariff differentiation practices in 1887 contributed to hurting the most efficient companies, which could charge the best customers lower freight rates to the detriment of inefficient companies, whose high operating costs forced them to charge higher rates.

The contemporary narrative that antitrust legislation is essential to containing the monopolistic practices that may appear on the market is also demolished by Armentano (2007). As he argues, the antitrust apparatus tends to do more harm than benefit consumers, attacking companies' alleged monopolistic practices with little or no basis. This is mainly due to the lack of clarity in the neoclassical microeconomic theory's definition of "monopolistic" practices in a free market environment:

> For example, when a company reduces its prices, is this competition or an attempt to monopolize the market? When a company gains market share, is this evidence of efficiency or a threat to competition? When business mergers are restricted by law, does competition increase or decrease? When a company engages in expensive research and innovation that competitors cannot easily duplicate, is it monopolization? Faulty theorizing about these issues could explain the attack of public policies on economic efficiency in the name of preserving competition. (Armentano 2007, xii)

As Armentano demonstrates, neoclassical microeconomics does not have objective criteria for defining competitive or monopolistic practices in the numerous situations between perfect competition and absolute monopoly, the "adequate" market share for companies ("competitive prices" versus "monopoly prices"), and the appropriate number of companies to guarantee the competitiveness of an economic activity. Like the issue of defining "competitive prices" through economic regulation, the whole purpose of "defending competition" from antitrust and regulatory agencies meets with the same pitfall that Hayek called "pretension of knowledge." Therefore, the essential problem with antitrust regulations is the power conferred on legislators to intervene in the market environment completely arbitrarily and, for many companies, the possibility of using this apparatus to limit the growth of more efficient competitors.

CONCLUSIONS

Although, in the long run, the creation of the Interstate Commerce Commission reduced the competitiveness of the railway market, there is still the belief that it guaranteed fair competition in the sector. However, this position does not come from rigorous and precise analysis, but from adopting an ex post narrative that regulations were created to moderate monopolist firms. Moreover, this view is strongly supported by neoclassical microeconomics, which considers infrastructure, economies of scale, and service differentiation as anticompetitive practices and sources of monopoly power rather than signals of competitive activity.

Despite most economists' view that regulations were necessary in the railway industry, they failed to protect the Interstate Commerce Commission from abolition in 1995. In spite of holding that an increase in competition helps promote efficiency, neoclassical economists fail to defend a free market in this industry effectively. Ramos (2017) defines this ambiguous position as a particular interventionist approach that has become popular among specialists in antitrust law and its derivatives. This approach is not "liberal," for it does not embrace a free market and considers a free, unregulated market fertile terrain for the surge of monopolies, but it is also not socialist, since it recognizes that state management is inefficient and does not defend complete economic planning.

As DiLorenzo (1985) demonstrates, the implementation of antitrust legislation in the United States at the end of the nineteenth century found no support among economists of the day, who did not consider economies of scale, market concentrations, or other practices currently regarded as anticompetitive as threats to the dynamic competition process. No economists were consulted because it was already known (by the supporters of the cause) that they would not provide support for such a regulatory apparatus—it was only with the mathematical formalization of the discipline and adoption of the concept of perfect competition that these regulations came to be seen as essential to mold the so-called imperfect markets to this "ideal" theoretical model. The neoclassical argument of seeking "efficient" allocation was never used to defend the creation of antitrust regulations, but was an ex post justification for maintaining the existing protectionist policies.

In relation to the Austrian approach, mainstream analysis is severely hard pressed to explain why the introduction of competition in the rail sector has been sought recently. To Austrian economists, the market environment functions as a discovery process in which competitive activity plays a crucial role in searching for new ways of serving consumers. To neoclassicists, there is nothing to be discovered—agents always maximize known functions and the business function is relegated to the background. After all, the question to be resolved is not what to produce, but how to allocate production.

Historically, monopolies have been associated with government restrictions such as tariffs, import quotas, commercial privileges, and market reserves. However, the gradual transformation of the concept of competition—from the process of discovery and rivalry to the efficient allocation of resources—shifted the focus of economists from government intervention to business activities, which also came to be seen as potential sources of monopoly power. In this sense, Rothbard's definition of a monopoly appears to be the most consistent with Austrian methodology—and with how studies in economics have been conducted since the emergence of this discipline—since it is the only one which is independent of competitive activity and in which consumer choice is restricted by law. In short, it is the only definition that establishes a monopoly as incompatible with the market economy.

From a historical point of view and in defense of competition, the antitrust regulatory apparatus deserves severe criticism. However, abolishing these regulations will not be easy, since the idealistic view that the free market can produce monopolies and that regulation protects the public interest is rooted in most contemporary economists' thinking. Also, the benefits of suppressing this apparatus are diffuse while the losses are concentrated: gains for consumers in a freer economy would be difficult to measure, unlike the elimination of the jobs and income of the countless professionals involved in antitrust proceedings. Moreover, this topic does not attract much interest from the discipline; after all, as Stigler (1971) pointed out, antitrust lawsuits currently pay economists very well.

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