On tragedy and hope: *homo economicus*, the invisible hand and reality

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Abstract

This article classifies goods according to their technical characteristics of rivalry and excludability, with the inclusion of new categories ranging from zero rivalry to infinite rivalry and from excludability to imposed access. The conceptual framework reveals concrete challenges in meeting the conditions of the first theorem of welfare economics, demonstrating that only private goods are the epitome of market theory, with an immense range of goods for which provision by means of free prices does not exist or is Pareto inefficient. A theoretical origin of externalities is proposed, as well as the technical or practical impossibility of completing markets and, through the price system, achieving their internalization. Lastly, the article demonstrates that many of the problems expected from market failures are fictitious because, rather than *homo economicus,* we are *homo sapiens*, the most cooperative beings in nature.

Keywords

Economic development, social welfare, welfare economics, markets, consumer goods, consumption, competition, social aspects

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I. Introduction

The first theorem of neoclassical welfare economics states that if consumers and producers are perfectly competitive, taking prices as given, if a complete set of markets exists and if there is perfect information, the market equilibrium —if it exists— is Pareto efficient. Together, these three conditions are known as a perfect market and their unfulfillment as market failure. The theorem indicates that, without market failures, free exchange guided by free prices will lead to Pareto efficiency, a term named after its creator, the Italian economist Vilfredo Pareto, an Italian fascist sympathizer who was appointed senator for life by Mussolini. A Pareto improvement is the reallocation of goods to benefit at least one person without harming anyone and a Pareto optimum is achieved when all Pareto improvements have been exhausted. This fundamental theorem is the formalization of Adam Smith's famous "invisible hand", which is often taken out of context and is mentioned only once in *The Theory of Moral Sentiments* of 1759 and once in *An Inquiry into the Nature and Causes of the Wealth of Nations* of 1776. In the former, Smith used the renowned expression to explain why landowners would divide their property into virtually equal shares. The author states: "It is in vain that the proud and insensitive landowner sees his extensive fields and, without thinking about the needs of his brothers, in his imagination consumes all the harvest that grows in them.…They are led by an invisible hand to make nearly the same distribution of the necessaries of life, which would have been made, had the earth been divided into equal portions among all its inhabitants" (Smith, 1759/2018, p. 128).

In his most important work, *An Inquiry into the Nature and Causes of the Wealth of Nations*, Smith uses the well-known expression to argue the importance of investing at national level:

> By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention (Smith, 1776/2012, p. 445).

However, Adam Smith's familiar phrase is used as a synonym for market efficiency, supposedly proven by the first theorem, which is a typical example of the deductive method, where the conclusion is determined by its premises. Like any mathematical theorem, it is a proposition that is always valid because the hypotheses define the result. If market equilibrium exists, using the conceptual framework of the first theorem, it is impossible not to arrive at the "invisible hand" since the very conditions that are imposed unequivocally establish the corollary. Within this perfect market, inaction is the best response, the famous *laissez faire*, *laissez passer*, since free prices would incorporate the information necessary to exhaust all possible Pareto improvements. The only problem is that the perfect market exists solely in an imaginary world; however, we economists tend to forget this and are left with the presumed, and perhaps desired, end result. The reality is that the basic model of market efficiency, which is supposedly universal, is based exclusively on one type of good, "private goods". Beyond this type of good and, in general, when one of the extreme conditions of the first theorem of welfare economics is not met, it is practically impossible for the free market to reach a Pareto optimum.

II. The exception as a rule

Classifying goods on the basis of two technical characteristics —rivalry and excludability in consumption— is very useful. Rivalry reflects the degree to which my consumption affects others' consumption of the same good at the same time. If I eat part of an apple, that part will no longer be simultaneously available to others, but when I watch a movie on Netflix, this in no way prevents tens of thousands of

other people from watching the same movie at the same time. That is, my consumption or use of that good does not affect in any way the simultaneous consumption or use of the same good by others, so its consumption is non-rival.

When classifying goods by their degree of rivalry, they are divided into the following categories: (i) individual goods, where my consumption prevents the simultaneous consumption of that unit of the good by others, as in the case of the apple, and (ii) collective goods, where several consumers —in this case, the term "users" would be more accurate— can simultaneously use the same unit of the good (see table 1). The consumption of collective goods may be congestible or non-congestible. With respect to non-congestible collective goods, which we will call "club goods", rivalry is non-existent since my consumption does not affect others' consumption in any way, as in the case of Netflix. Regarding congestible collective goods, my consumption does not impede that of others, but it does affect it, with varying degrees of rivalry. An example of this is a congested road or when the "tragedy of the commons" occurs, where any attempted consumption impedes consumption by all. This is an extreme case that represents a generalization of the problem presented by Garrett Hardin (1968) in his paper of the same name. An example would be the congested road that becomes gridlocked with my usage. In the case of club goods, non-rivalry may have a threshold beyond which such goods become congestible; in such cases we will call them "saturable club goods". Examples of these are roads, which can handle up to a certain number of vehicles without congestion, and Netflix, should its technology platform reach maximum capacity.

Table 1
Goods according to degree of rivalry

Rivalry	Rivalry	My consumption prevents consumption by others	A	Individual consumer goods
		My consumption affects consumption by others	B	Congestible goods
		No one can consume	C	Tragedy of the commons
	Non-rivalry	My consumption does not affect consumption by others	D	Club goods

Source: Prepared by the author.

Excludability is the technical possibility of exclusion from consumption of a good. In practice, excludability and non-excludability also depend on the institutional framework and, essentially, on property rights. An apple is a good with a high degree of technical excludability, but property rights can be established whereby apples are freely accessible and free of charge. By contrast, software —and knowledge in general— is a good that is generally easy to access. However, patents are imposed to restrict its consumption, thereby achieving a high level of excludability at the institutional level. While I could find a way to technically access the software, if I got caught, I would face severe penalties. Exclusive property rights of a good make it possible to establish prices and exchange it on the market; in other words, to turn that good into a commodity. These are collective decisions that should reflect civilizational and technical advances, as well as the circumstances of a given society in the pursuit of the common good. Ultimately, they are also profoundly political acts, reflecting power relations within society and globally. A clear example of this at the international level are the barriers imposed to access knowledge generated in developed countries, which is not the case for the consumption of global environmental goods produced in developing countries.

The cost of enforcing exclusive property rights is inversely proportional to the ease of exclusion. Thus, easily accessible goods often enter the market differently, without charging prices directly to consumers. One example is free-to-air television, where anyone with a television set can watch, for free, a movie broadcast by a given television channel. In this case, the business model revolves around requiring sponsors to pay for advertising, rather than the impossible task of charging a fee to viewers. However, technological progress can affect the degree of excludability. Cable television and services such as Netflix offer series and movies of the consumer's choice and without advertising, but only for those who pay a monthly fee. Thanks to new technologies, exclusion from these services is quite simple.

Excludability in easily accessible goods can also be achieved through imaginative solutions. Generally, garbage collection services are provided by the public sector, which charges citizens a flat fee or tax, regardless of the amount of service consumed. Garbage collection was generally considered a service with low excludability, since it was very costly to discriminate between those who paid collection fees and those who did not. In other words, garbage was collected from everyone, until one municipality started requiring citizens to purchase municipal garbage bags, rather than charging them fees. This simple change achieves not only excludability in collection (only garbage that has been placed in the municipality's bags is collected); in addition, those who generate more waste pay more, as is desirable. If the special garbage bags were private, the service could be provided spontaneously by the market. However, it would not allow competition since an existing company in the sector would always be able to serve one more customer at a lower cost than that of a newcomer. This is what is known as "economies of scale", which reduce average costs and generate "natural monopolies", where it is always better for the same company to provide more services than for new companies to enter the market. The problem is that garbage collection is a basic service, so demand is quite insensitive or inelastic to price. As a result, private service would lead to a monopoly with significant market power. This is one of the reasons why, in general, garbage collection remains a public service. Now let us look at the example of street lighting service. Even if you never go out at night, you have to pay the same rate as the neighbour who always goes out at that time. There is still no technical or institutional way to achieve excludability in this service, so it will have to continue to be financed with taxes and the private sector will not be able to provide it spontaneously.

Unless otherwise specified, this analysis refers only to the different levels of technical excludability.

When considering their degree of excludability, goods are classified into (i) goods from which my consumption can easily be excluded, called "excludable goods", as in the case of an apple; (ii) goods where it is very costly or impossible to exclude my consumption, called "free-access goods", as in the case of a road with many entrances; and (iii) goods where even I cannot exclude myself from consumption, called "imposed-access goods", such as national defence (see table 2).

Table 2
Goods according to degree of excludability

Excludability		
Excludability	Non-excludability	
I can be excluded from consumption	I can exclude myself from consumption	I cannot exclude myself from consumption
A	B	C
Excludable goods	Free-access goods	Imposed-access goods

Source: Prepared by the author.

Rivalry and excludability will now be combined. In the economic literature there are several conceptual frameworks, many ambiguities and a great deal of confusion when defining public and private goods. This classification often depends on whether the goods are provided by the State or the market, and whether they are publicly or privately accessible. In this article, goods will be classified solely on the basis of their respective technical characteristics of rivalry and excludability, regardless of who provides them or the associated property rights.

Private goods are characterized by individual consumption and excludable access (for example, an apple) and correspond to cell AA in table 3. The greater the ease or lower the cost of achieving excludability and the smaller the possibility of collective consumption, the purer the private goods will be and the greater the probability that the market will produce them spontaneously and efficiently in the Pareto sense. All other goods will generally be considered market failures, since free market provision,

if possible, will only be efficient in exceptional cases. At the other extreme of private goods are pure public goods, such as national defence; that is, club goods with compulsory access, which correspond to cell DC in table 3.

Table 3
Goods according to degree of rivalry and excludability

				Excludability		
				Excludability	Non-excludability	
				I can be excluded from consumption	I can exclude myself from consumption	I cannot exclude myself from consumption
				A	B	C
Rivalry	Rivalry	My consumption prevents consumption by others	A	Private goods (e.g. apple)	Winner-take-all (e.g. Mocha Dick)	
		My consumption affects consumption by others	B	Congestible excludable goods (e.g. road with access control)	Congestible free-access goods (e.g. road with no access control)	Congestible imposed-access goods (e.g. habitat)
		No one can consume	C	Tragedy of the commons (e.g. gridlocked road with access controls)	Tragedy of the commons (e.g. gridlocked road with no access controls)	Tragedy of the commons (e.g. collapsed habitat)
	Non-rivalry	My consumption does not affect consumption by others	D	Excludable club goods (e.g. Netflix)	Open-access club goods (e.g. open-access software)	Pure public goods (e.g. national defence)

Source: Prepared by the author.

The closer goods come to the characteristics of non-rivalry and non-excludability, they are referred to simply as public goods, and it is increasingly difficult for the free market to provide them and, if it does, to provide them efficiently. To understand this intuitively, let us examine the extreme cases. Once a club good like Netflix is created, excludability is undesirable owing to its Pareto inefficiency, given that the more people enjoy the good up to its saturation level, the better off someone is without anyone being worse off. For an imposed-access good like national defence, establishing exclusive property rights is completely ineffective, thus there are no market prices and the commercial production of the good using the price system is unfeasible.

This conceptual framework may also be used to understand the origin of "externalities". An externality is an effect of compulsory access on third parties, caused by the actions of an agent whose objectives differ from that effect. Defining whether something is an externality depends on subtle differences. Let us take as an example my neighbour's beautiful garden. If the intention was to decorate the house and that also provided a pleasant landscape for the whole neighbourhood, it is a positive externality. If the flower garden was created specifically to brighten up the neighbourhood, it is no longer an externality, but rather an intentional contribution to benefit others. If someone intentionally sought to live near that house to benefit from the garden landscape, it is not an externality either, because the benefit was not gained from compulsory access and the new neighbour is intentionally making use of a good for which exclusion is unnecessary or very costly. The two essential ideas in the definition of an externality employed here are: (i) the agent producing it is acting in his or her own interests and is not deliberately seeking to benefit or harm others and (ii) these benefits or harms entail compulsory access for third parties.

According to the present approach, positive externalities will arise from the production of an imposed-access good, while negative externalities will result from the use of a congestible good or from mutual blocking of access to a good. The neighbour's garden is a public good that generates a positive externality —a beautiful landscape— while ugly billboards that partially cover the garden would be visual pollution analogous to environmental pollution; that is, a negative externality resulting from the consumption of the congestible good called "habitat". The landscape of the neighbour's garden corresponds to a "local public good" because it is a club good with compulsory access that is restricted

to a specific place, unlike global or national public goods, such as the fight against climate change or national defence, respectively. For residents of other neighbourhoods, my neighbour's garden will be a free-access good, and if they try to view the garden from my house simultaneously, they will reach a point where they will block each other. This will generate negative externalities once again, this time for accessing the good.

A special case is that of individual but easily accessible goods, which can result only in the "tragedy of the commons" by mutual blockage or a "winner-take-all" situation (cell AB in table 3), because the winner effectively takes all without leaving anything to others. One example is the hunt for Mocha Dick, the giant white sperm whale that inhabited the seas off Mocha Island in Chile in the nineteenth century and inspired *Moby Dick*, the novel written by Herman Melville in 1851. Many whalers spent decades hunting the giant whale and may have blocked each other in the process, such that the sperm whale survived close to a hundred hunting attempts and some 20 harpoons in its body, until a single "winner" caught it in 1838.

III. The world is one big market failure

It is worth recalling that the first theorem of neoclassical welfare economics states that perfect competition, complete markets and perfect information are sufficient conditions for free prices to lead us to a market equilibrium that, if it exists, results in the famous invisible hand. In other words, it reaches a Pareto optimum.

The technical or practical impossibility of establishing effective property rights owing to a good's low excludability renders ineffective the existence of a price for such a good. As a result, it will generally not be provided by the market. In the —unfortunate— case of Mocha Dick, an individual "consumer" good, the market solution states that, if the exclusive right to hunt the sperm whale had been auctioned, the one who most wanted it would have acquired it and the result would be Pareto efficient. But how much would it have cost to enforce this exclusive right? If in practice it was impossible to enforce it, no informed and rational person would have purchased the right. In the case of free-access goods, such as free-to-air television, the market can provide them without using the price system directly, thus Pareto efficiency is not guaranteed. Only highly excludable goods would remain as direct candidates that meet all the conditions of the first theorem.

Turning now to analyse the technical characteristic of rivalry, the consumption of collective goods with a high degree of rivalry is a source of negative externalities. In turn, externalities are a form of incomplete markets. If the first motorists on the congestible road or the first residents from other localities who came to see my neighbour's garden could negotiate with each of the new users to determine their respective access, an efficient situation could plausibly be reached, but such a market does not exist. Consequently, congestible goods would break the second condition of the first theorem of welfare economics.

Conceptually, the neoclassical means of correcting an externality so that it reaches Pareto efficiency is its internalization; that is, ensuring that the agent producing the externality assumes the corresponding marginal cost or benefit that it creates in the system. Another example of a negative externality is if my officemate smokes and I am harmed by their cigarette smoke. If an air market is created, my colleague would have to pay me for consuming the clean air to which I am entitled, thus internalizing the externality being created, and we would supposedly reach Pareto efficiency through free exchange. The problem is that in the real world there are many participants who are unknown and even changing, as in the case of the congestible road or the commotion over the neighbour's garden, and if negotiation were possible, the transaction costs would be enormous.

Privatizing the road or access to the garden view (that is, giving property rights to a private agent) would be a type of centralized solution because the negotiation concerning access would not take place directly between the beneficiaries and the injured parties and, as such, efficiency would not be reached through mutual exchange and the respective exhaustion of the Pareto improvements. Moreover, Pareto efficiency would not even be guaranteed, since by having a marginal cost of zero to serve a new user and not directly receiving the cost of new users, the private administrator of the good will benefit from maximizing income, even if this leads to the tragedy of the commons. In countries such as Singapore, the public administrator of a congestible road charges new users a price close to the full marginal cost that such use entails, thereby internalizing the externality and approaching Pareto efficiency, but this requires a public rationale rather than a private one.

While collective goods involving a high degree of rivalry generate negative externalities among users, low-rivalry collective goods prevent competitive markets, since in principle it will always be cheaper to serve more people with an existing collective good than to produce new similar goods, thus breaking the first condition of the theorem once again. Returning to the issue of economies of scale and natural monopolies, such as garbage collection services, it will always be cheaper to serve one more user than to establish a new company to provide the service. An extreme case of this are club goods, where the marginal cost of serving a new user is zero and where exclusion produces Pareto inefficiency.

In short, all collective goods would break either the first or second condition of the first theorem of welfare economics, such that free market provision, if feasible, would not necessarily be Pareto efficient. As seen in the case of Singapore's roads, this does not mean that the provision of collective goods cannot be Pareto efficient. In their seminal articles, Samuelson (1954) establishes the optimal conditions for providing public goods and Buchanan (1965) does the same for congestible goods, which he calls "club goods". However, instead of a free market, these solutions correspond to centralized and cooperative arrangements, respectively.

For the much-desired efficiency of the free market, Adam Smith's famous invisible hand, we would then be left with only highly excludable and individually consumed goods: private goods. These goods are the exception, rather than the rule, yet they constitute the epitome of market theory and mainstream modern economics, which, as a corollary, justifies State intervention only to correct market imperfections. The problem with *laissez faire, laissez passer* is that, using proponents' own terminology, the world is one big market failure.

IV. Cooperation or competition?

A Beautiful Mind, the four-time Oscar-winning 2001 film based on journalist Sylvia Nasar's 1998 book of the same title, chronicles the life of mathematician John Nash of the United States, winner of the 1994 Nobel Prize in Economic Sciences for his contributions to non-cooperative game theory. Viewers will recall poor John desperately looking for an original idea for his thesis when he was a 20-year-old PhD student in mathematics at Princeton University. One night, while at a bar on campus with his friends, a beautiful blonde woman walks in surrounded by other attractive friends. Jokingly, one of Nash's companions proposes duelling until there is only one suitor left for the blonde woman. His friend and rival Martin Hansen then starts to quote Adam Smith and everyone says in unison that, in competition, individual ambition serves the common good, while one person concludes with "every man for himself". Nash —portrayed by Australian actor Russell Crowe— lights up and says that Adam Smith needs to be revised because if everyone goes for the blonde woman, they will block each other. He concludes that Adam Smith was wrong: competition is not necessarily good and could lead to the worst of all worlds. At that moment, Nash decides that this will be the subject of his thesis. When he presents his initial progress to his supervisor, Professor Albert Tucker, the latter comments in amazement, but with

absolute certainty of the genius of the idea, that he is changing 150 years of economic history. Today, the Nash equilibrium is a central concept in game theory and teaches us that, given the interdependence of our actions and other agents' response capacity, it is cooperation —and not competition— that leads us to collectively optimal situations.

The classic game to represent the Nash equilibrium is the "prisoner's dilemma". It consists of the following scenario: two guilty parties are imprisoned and held incommunicado, each with the option of confessing or not confessing. If neither confesses, both will receive light sentences; if one confesses and the other does not, the one who confesses will go free and the one who does not will receive the harsher sentence; lastly, if both confess, both will receive an intermediate sentence. In a framework of self-interest and mutual distrust, the "dominant strategy" of both parties will be to confess, since that will be the best response, regardless of what the other party does. From my selfish point of view, if I confess and you do not, I will go free. This is a better outcome than if neither you nor I confess, where I would receive a light sentence. If both you and I confess, I will receive an intermediate sentence, which is better than if I do not confess and you confess, in which case I would receive the heavier sentence. Considering these "rational" premises, both parties will end up confessing and receiving intermediate sentences. However, this result is Pareto-inefficient because, without confessing, both could have received light sentences. It is cooperation —and not competition— that would have led to the optimal solution. If the dilemma is repeated each year indefinitely, the prisoners may come to cooperate —that is, not confess— in pursuit of their own self-interest, but to do so they must be persuaded that the other will act in an equally selfish manner. If at any point the prisoners believe that the other has adopted a code of honour that, regardless of the circumstances, prevents him or her from confessing, once again their respective "rational" responses will be to confess. In other words, in repeated prisoner's dilemma, "cooperation" results in selfishness and mutual distrust. If both parties truly held as a code of honour never to confess, the dilemma would be solved, even if playing it just once. It is not *homo economicus*, but rather *homo sapiens*, with values, capacity for learning, mutual trust and spirit of cooperation, that leads us to the best of all worlds.

Supporters of exclusive property rights and Pareto efficiency would have recommended to Nash and his friends that, instead of duelling or going all at once for the blonde woman, they should draw lots among themselves for the right to approach her. The lucky winner would then start to auction off his "right to approach" until the person willing to pay the highest price would get the right to approach the blonde woman on his own. Even if this situation were plausible, everyone would have to respect the right of the auction winner, which would require either absolute mutual trust (again, cooperation and not competition) or the involvement of university police (a centrally provided local public good) to ensure the "right".

Although it may seem ridiculous to try to determine who gets to approach the blonde woman on the basis of property rights, the example conveys the equally —or even more— absurd intention to commodify all dimensions of life. The most extreme example of this is anarcho-capitalism, in which even the administration of justice, public safety and national defence must be provided by private courts, police and armies, respectively. These companies would have to compete to provide better service to citizen-customers, according to the principle that only exclusive property rights can guarantee individual sovereignty or freedom, in addition to the assumption that competitive markets can always exist and that they alone lead to socially optimal resource allocation. Its founder and main proponent was the economist Murray Rothbard of the United States, who defended the legality of child labour and parenthood as property rights over children, and denounced Milton Friedman himself as an enemy of the free market (Rothbard, 2002). Authors associated with anarcho-capitalism, such as Anderson and Hill (2004), have presented as evidence of the success of their proposals the respect for property rights and the resolution of conflicts without need of the State that, according to them, occurred in the United States Far West in the eighteenth and nineteenth centuries.

There is a long-standing discussion as to whether a certain aspect of the administration of justice is a public or private good, as Correa, Peña and Vargas (2000) highlight. It would also be possible for security firms to serve as substitutes for the police since a certain degree of excludability is possible. However, the private national defence proposed by anarcho-capitalists would undoubtedly constitute a public good whose commercial provision would be impossible or completely inefficient. Ethical considerations aside, the anarcho-capitalist system, framed in the "libertarian" political movement, ignores the problems of supply and efficiency that the free market would face with anything other than private goods, even more so if economic actors focus on anarcho-capitalist individualistic premises.

Returning to the tormented Nash, and with apologies to all blonde women, he and his friends faced another dimension of the non-excludability problem, which the biologist Garrett Hardin raised in his 1968 article "The tragedy of the commons". Hardin was distressed about the risk he saw in human overpopulation, predicting that it would result in the inevitable collapse of common goods, which are open-access congestible goods. This would be particularly serious in the case of renewable resources, where overexploitation leads to their extinction. Hardin gave the example of a farmer who takes his cows to pasture and only considers the non-negative net benefit of using the pasture for free, which will deplete the land. In the end, everyone will lose because they acted rationally but individualistically. Like Nash's thesis, the article was a critique of Adam Smith's hypotheses. According to Hardin, "ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all" (1968, p. 1244).

Hardin correctly argued that the tragedy of the commons could be solved with an adequate exclusion mechanism. However, contrary to what is usually referred to in mainstream economic thought, the questionable privatization of the common good was only one of several proposals he presented in his famous paper, although he always based his analysis on the assumption that all people were selfish *homo economicus*. Hardin recognized that privatization could generate inequity but justified it by arguing that "injustice is preferable to total ruin" (Hardin, 1968, p. 1247).

Garrett Hardin was an anti-immigrant white supremacist and his well-known article also argues that people should not be free to decide the number of children they have and those who are biologically superior at managing property and power should inherit more. He also criticizes the welfare state, United States liberals or social democrats, the United Nations and even human rights. He asserts: "If we love the truth we must openly deny the validity of the Universal Declaration of Human Rights" (Hardin, 1968, p. 1246).

Nevertheless, "The tragedy of the commons" is one of the most (poorly) cited articles in history, with the aim of promoting exclusive property rights and the marketization of the commons when, objectively, it did not meet the standard for inclusion in the prestigious journal *Science*.

Over 30 years later, Elinor Ostrom, an unknown political science professor at Indiana University, became the first woman to win the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, created in 1969 by Swedish central bank economists, for her contributions to the analysis of economic governance. Although Ostrom was not an economist, rarely has the misnamed Nobel Prize in economics been as well-deserved as the one she received in 2009. Ostrom had devoted her academic career to demonstrating how communities that share common resources manage them sustainably, without the need for exclusive property rights or coercive State intervention, but rather through voluntary cooperation and local collective action, which she called "governing the commons" (Ostrom, 1990). Instead of starting from abstract theories, Ostrom drew on multiple case studies from around the world and disproved Hardin and conventional economics, because fortunately we are still *homo sapiens*, the most cooperative beings in nature.

The very definition of what is "common" will vary according to different cultures. For the *sumak kawsay* or good way of living of many Andean Quechua peoples, privatizing water sources would be equivalent to appropriating life itself. From their world view, it is simply unthinkable that water sources

should become a commodity and not be freely accessible. How should these common resources be managed so as to avoid opportunistic behaviour that affects what belongs to everyone? Ostrom presents different types of partnership and management systems, but it is very difficult for virtuous institutions to exist without virtuous people. Thus, ultimately, it is the shared values and the mutual trust among community members that are fundamental.

While Ostrom's contribution was significant and dismantled Hardin's negative determinism, her approach presents a serious problem: the greater the number of people in a community, the more difficult it is to coordinate the management of the commons. Therefore, at least above a certain population size, it is more efficient to have an institutionalized representation of the community that decides, coordinates and executes the administration of common goods. In modern society, this is called the State.

V. *Economicus* versus *sapiens*

Externalities are the most widespread manifestation of interdependence. Hardin's example of the use of pasture generates negative externalities for other users and, at its extreme, causes the tragedy of the commons or results in no one being able to enjoy that good. It is already known that the neoclassical conceptual solution is to create markets through the establishment of adequate property rights that enable exchanges and achieve the internalization of externalities through the price system. In another seminal paper, Coase (1960) proposed what would later become known as the Coase theorem: regardless of who has these property rights, with low transaction costs, exchanges will lead to Pareto efficiency. In the example of the smoker and the non-smoker, it does not matter whether the non-smoker has the right to clean air or the smoker has the right to smoke; the important thing is that they can negotiate without incurring major costs and thus reach Pareto efficiency. The way in which property rights are granted has crucial distributional effects, but in terms of efficiency, it is sufficient that prices internalize externalities.

As mentioned above, the world is actually a universe of multiple large transaction costs, such that in the presence of externalities, the free market will not usually lead to an efficient situation. Moreover, beyond the fundamental distribution problem, there are other unavoidable ethical questions linked to this way of seeking the famous invisible hand. Taking Coase's original example, let us imagine a factory spewing smoke in a neighbourhood and, moreover, let us assume that the population of this neighbourhood lives in extreme poverty. The "internalization of externalities" means that, if the neighbourhood has the right to clean air, the "efficient" solution would be for those living there to let themselves be subjected to pollution in exchange for payment. Furthermore, no one should intervene for the sake of "consumer sovereignty" even though a wealthy neighbourhood would not even allow the construction of a polluting factory. What the devotees of the invisible hand fail to understand is that this example is no longer about free exchange; instead, it is conditioned by poverty, and is therefore no longer about the supremacy of the consumer, but rather about the supremacy of misery. Not everything can become a commodity.

The good news is that there are also positive externalities, such as the beautiful view of the neighbour's garden across the street. In a world of *homo economicus*, this type of good will only be provided individually if its benefit is greater than the cost to the respective agent. The bad news is that, if it exists, its provision will be inefficient, because if that neighbour could be compensated for the benefit he or she is providing to others, the garden would probably be bigger or better. Knowing that its benefits extend to the entire locality, the neighbourhood committee could ask each beneficiary to provide this compensation to the neighbour, but if everyone is *homo economicus* and knows that exclusion from the garden's benefits is impossible, no one will offer the fee voluntarily. This is known as the free rider problem, relating to someone who deliberately tries to enjoy the benefits of a collective good or service without having participated in its costs. This problem also arises with the anarcho-capitalists and their private armies: if everyone has to be defended equally in an armed conflict, a *homo economicus* would never contribute voluntarily to defence. Another example is the

dishonest person who does not pay the condominium cleaning fee because, as long as others pay, he or she will benefit from having it cleaned. The free rider problem may involve collective goods that are impossible or costly to make excludable, that is, "public goods". In game theory terms, for *homo economicus*, being a free rider would be the "rational" thing to do and is another type of Nash equilibrium, where the non-cooperative solution leads to the worst of all worlds: the non-provision —or suboptimal provision— of public goods.

As we have seen, when faced with recurring situations, *homo economicus* agents will understand that without cooperation everyone will lose, but they must be persuaded that others will act as they do. If they believe that others are spontaneous cooperators, their best strategy will be to not cooperate, which means that cooperation among *homo economicus* is based on mutual distrust, as discussed above. Adam Smith's invisible hand is also a paradoxical form of cooperation, putting *homo economicus* in competition with everyone else, presumably to achieve the best possible social outcome. On the surface, good things are achieved in all these contexts. However, much more is lost, such as mutual trust and pursuit of the common good, virtues that are fundamental to life in society.

The market solution to achieve Pareto efficiency in the presence of externalities is often technically impossible or absurdly costly, and, in trying to commodify everything, it becomes morally disgraceful or socially ridiculous. Fortunately, the poor do not accept being subjected to pollution against payment; neighbours volunteer to improve the neighbourhood garden; public goods, such as national defence, exist thanks to social contracts that establish a central authority in charge of executing, at the institutional level, collective action for the common good; condominiums are clean because their inhabitants have a sense of cooperation or, if they do not act out of integrity, they will do so given the cost of the shame of not cooperating; and attractive blonde women generally do not need mechanisms —much less market mechanisms— to avoid being harassed, because this would be socially and even legally penalized. The explanation for all this is that people are not *homo economicus*, but rather *homo sapiens* with virtues, a great spirit of cooperation, capable of mutual trust, subject to social scrutiny and with intrinsic values such as dignity.

The basic problem with neoclassical economics, at the heart of which is market theory, is that it assumes that we are all individualistic, ambitious, competitive and amoral *homo economicus*, when in fact we are much nicer *homo sapiens.* Therefore, many goods and services are generated and managed outside the market, with collective action based on cooperation and the logic of the common good rather than on competition and personal gain.

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