

Externalities and Public Provision of Education

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Abstract - This paper investigates the role of government in providing education, especially at the regional and local level. The public (or semi-public) good nature of education and the presence of externalities in the production and consumption process can lead to situations of market failure. Consequently the market can be driven to solutions that are not socially efficient and that's the fundamental reason to defend the public provision of education. But there is also a role to be developed by the private school, in this market.

Locally, the economic analysis points to an important public role in the provision of educational services, especially at the level of basic education. The justification is based mainly on grounds of fairness, that is, the more or less universal access to the benefits of education being the central issue.

1. Introduction

The present study aims to investigate the role of government in providing education, especially at the regional and local level.

Despite the different levels of state participation in the educational market worldwide, it is undisputed that this presence today is very significant, either by the volume of financial resources used, either by the political discussion involved in the definition of the goals and other issues relating to the availability and operation-modalities of the education system, to the interested parties.

The discussion then goes irremediably into a "dual" analysis of efficiency versus equity. In this sense, our analysis intends to inquire about the particular characteristics of functioning of this market that can lead to socially inefficient equilibrium solutions, and thus justify the presence of the state as regulator.

The work is carried out in four points. The first section introduces the concept of externalities. The second attempts to frame education as a public good and discusses the market failures that are associated with the presence of externalities. The third makes the analysis of external effects in the education market that justify the public provision of education. The fourth point addresses the issue of efficiency vs. equity in the market mechanism and includes some

considerations regarding the public provision of education in a local context.

1) The "Gallery Of Externalities"

The concept of externalities is, perhaps, one of the most inaccurate of the economic literature. Despite the extensive literature on externalities, the definitions are few and generally unsatisfactory. Many scholars do not even define the phenomenon, identifying it only by its consequences and by enumerating a long list of examples. It's the "gallery of externalities".

Yet, the concept is not new. Introduced by Marshall in the famous "Principles of Economics" (1890), it benefited from a strong controversy in the 20s and 30s of the last century. Highlighted, here, are the contributions of Knight, Young and Pigou and, later, the effort of multiple authors such as Meade, Viner, Scitovsky, Baumol and Oates, among others, to generalize the concept. The 60s and 70s went as the scene of an abortion of the consensus previously generated. After the controversial analysis of Coase, in the early 60s, and the development of the so-called Property Rights paradigm, the discussion would not ever be the same. The discussion about the paper of the Government in the process of internalization of the externalities took a new breath. And, there are, still, significant differences in the classification of the various types of externalities.

In a general approach, we can say that we are in the presence of external economies (or diseconomies) whenever the utility of an agent is influenced by the utilities of other agents, that is, the decision of an agent depends on and is influenced by the decisions of others; or when a given agent can not appropriate all the benefits that he creates or is not forced to pay all the damages that generates for the community.

This idea is present in the definition of externalities of Baumol and Oates (1975) by two conditions:

- We are in the presence of externalities when the utility or production of an individual includes real variables whose values are chosen by others (individuals, corporations, government) without particular attention to the effects on his welfare.
- The decision-maker whose work affects the utility or production function of others, does not receive (or pay) in compensation for that activity,

an amount equal to the marginal costs or benefits that result.

This definition leads us to the element of general agreement: the externalities are the cause of the divergence between private profit and social benefit (or private cost/social cost) and lead to situations where market mechanisms do not lead to optimal allocation of the resources.

The General Equilibrium Theory postulates that assuming the hypotheses of perfect competition in the market and perfect divisibility of goods and factors, the market forces leads to a situation of Pareto-optimism, so that any change of behavior from an individual or company and the impact on the welfare or income from other individuals or companies is transmitted through the system of prices.

Exceptions include, however, a number of situations where there is direct interdependence between agents operating outside the market. It is in this line of thought, that Meade (1952) defines external economies. For this author the external economies exist when the output (x_1) of a firm depends not only on inputs used (l_1, c_1, \dots) but also from the output (x_2) and the factors used (l_2, c_2, \dots) within another company or group of companies, that is, $x_1 = F(l_1, c_1, \dots, x_2, l_2, c_2)$. This is a situation of direct interdependence between producers. The example of the apples and the bees, provided by the author, is now a classic. The "Fable of the Bees" put in evidence the way that, the near presence of a bee-keeper producer operation, creates a better result in a farm of apples production. In fact, the bees, facilitating the *polinization* of apples flowers, generate a surplus in terms of apples farm profit. That is reflected in the microeconomic production function of the apples firm.

However, this clear situation of direct interdependence among producers is not unique. Bourguinat and Scitovsky also mention a number of other situations of interdependence that are now part of the extensive gallery of externalities.

Bourguinat (1964) referred the situations in which the satisfaction of an individual may depend not only on his consumption or effort but also from outside influences that can come from three categories of agents:

- Producers: we find the example of the external economies created by an industry making some infrastructures that benefit the in-habitants of a region, without the capacity of appropriating the benefits created or, conversely, the external diseconomies resulting from certain polluting activities that generate noise or smoke or toxic waste.
- Government: all benefits available to the community by the state, including the so-called public goods and services (scientific research programs, among others) constitute, for the population, partial external economies, since there is no equivalence between the disutility of

tax incumbency and the usefulness of services received.

- Consumers: the interdependence of consumers leads to situations where the satisfaction level of an individual is affected not only by his level of product consumption, but also by the satisfaction of other consumers with higher incomes, often leading to imitation and contagious effects.

Particularly interested in externalities at the consumption level are, also, Buchanan et Stubblebine (1962). For these authors, externalities exist as long as the utility of an individual A depends not only on the activities he chooses (x_1, x_2, \dots) but also from an activity (Z) chosen by another person B .

Scitovsky (1954) extends the concept into situations in which this interdependence operates through market mechanisms. The definition of external economies then arises in terms of profit. Thus, whenever the profits of a company (P_1) does not depend only on the production itself (x_1) and inputs used (l_1, c_1, \dots) but also from the production (x_2) and other inputs (l_2, c_2, \dots) from other companies, we invoke the presence of externalities: $P_1 = G(x_1, l_1, c_1, \dots, x_2, l_2, c_2, \dots)$.

In this case, the external economies work through the market, affecting prices directly. For example, the investment in an industry lead to the expansion of its productive capacity and can lead to falling prices of its products and rising prices of inputs used, and that benefit, respectively, the consumers of these products and the suppliers of inputs. Note that those agents will not pay the equivalent compensation. We are in the presence of so-called *pecuniary* external economies, a classification that comes from Viner, as opposed to so-called *technological* external economies that correspond to those given by Meade.

2. Public Goods and "The Anatomy of Market Failure"

According to Bator (1958), externalities are basically market failures whose anatomy should be investigated. The market failure is understood here as the failure of a system of prices and market rules designed to signal the desirability or non-desirability of a given activity. This is to be evaluated with respect to the solutions of a social welfare function that is maximized.

The central theorem of the modern Theory of Welfare, known as the *Duality Theorem*, tells us that under certain restrictive assumptions about technology, consumer spending and motivations of the producers, the equilibrium conditions that characterize a system of competitive markets has a perfect correspondence with the requirements of Pareto-efficiency, as we mentioned. The problem of maximizing the welfare leads us to determine a set of "shadow prices" which have the analytical characteristics of prices, wages, interest rates and rents. But this implies that the calculation of the

decentralized market account for all economic costs and benefits relevant to the welfare function.

According to Bator, this duality can fail.

- Either because the market misses the signals/incentives sent to the system, or by the structure more or less monopolized the market. We find ourselves in what he calls the technical externalities: situations where due to various causes (in general, problems of indivisibility and interdependence) market private and social costs, or benefits, differ, in the margin and in total values, whether the benefits.
- Because, due to institutional imperfections of organization and capacity limitations of accounting, some inputs are not properly accounted for. There is, here, a flaw that Bator calls "failure by enforcement." The author refers to a series of situations where the market fails in the extent that one factor is not paid - including fisheries and all situations of free access to natural resources. In this type of market failed matches a group of externalities means that the "ownership externalities".
- Either because it simply does not exist. It is the so-called "failure of existence" and that corresponds to the case of public goods.

It is this latter aspect that interests us especially.

For Samuelson, the quality that defines a public good is the consumption of each individual does not imply any subtract-ability in the consumption of the good by another individual. In this case, the formal conditions of the marginal rate of substitution that define the frontier of possibilities of Pareto-efficient utility does not lead to any kind of vectors of market prices used when a routine, useful for establishing the output-mix and for the distribution in a decentralized organization, is working.

In a simple language: A strong argument for state intervention in education derives exactly from the nature of public or semi-public good. The definition of public good and its differentiation from private goods can be seen as follows: A pure public good has two main properties: non-rivalry and non-exclusion. In the case of education, we are faced with goods and services with public goods nature: non-exclusion (no user can prevent someone else to use, too, the educational services) and non-rivalry in consumption (the use of services by a consumer does not decrease, at least significantly, the amount available for consumption by other consumers). In fact, individuals may act as "free riders" and acquire the services at zero prices. The presence of positive externalities in this case is evident, in that the consumer does not pay for using the service a price equal to marginal benefit.

The greater the degree of rivalry (that is associated with the idea of scarcity), and the degree of exclusion (associated with the idea of property), plus the public good approaches a pure public good. It is evident that the pure public goods are rare.

As for education, its inclusion as a public good depends on the actual educational level. At the level of compulsory schooling (the mandatory first years of school-education), this formation is seen as an absolute desideratum and absolutely necessary to prevent. So it that is often seen as a real public good, especially in European societies where the "welfare state" is the rule. In these societies the rule is the almost full government provision of education at this level of education.

However, the same cannot be said for the post-compulsory education. First, financially it would be very complicated in the context of current public policy, think on an absolute public provision of education, particularly at the university level. Simultaneously, it is recognized that at this level, the degree of responsibility for the education of young-adult and adult should have to pass to a more personal level of motivation and financial participation.

In terms of "ownership" and speaking about non-rivalry characteristics, it can be assumed that this level of post-compulsory education is to some extent, not rival. A set of individuals can take ownership of both the teacher's knowledge. However, the classroom may have limitations in terms of space available for the attendance of students. The teacher capacity to care and of tutoring is limited.

Regarding the exclusion, the situation is more debatable. If education and teaching were of universal free access then the exclusion would be impossible but if, for example, at the level of higher education, given the existence of "numerus clausus" and the existence of tuition (even at lower cost) the exclusion is already a fact, in this sense, we can approach a semi-public or even private provision. In fact, what usually happens is that, with limited entries in the public university, the excess demand will have to be met with private provision of university education.

There are still issues of ideological nature. Those have to do with the personal attitude/position in the face of state intervention in these areas, not forgetting that Education Policy can be an important element of social regulatory function. In fact, corporate propaganda reflects the interests of dominant social groups and is central to social reproduction models.

Beyond the discussion of higher or lower economic efficiency of the State's economic performance as an agent, there is a political discussion about the social functions of the state that is always present in this debate and that includes the important issue of fairness that we deal ahead .

3. Externalities and the Provision of Public Education

Given the foregoing, the question should be how far the public provision of education turns out to be. That means we must identify the externalities associated with the goods and services in education

(and the market failures associated with the education market), to justify the presence of the Government.

According to Chagas-Lopes (2004) and Blaug (1991) we can identify at least the following externalities associated with education:

In terms of positive externalities, we noted that the skilled and highly qualified worker or manager is a factor of productivity gains and ability to attract more dynamic capital: with the introduction of new technologies, rather than the logic of competition for low wages; with reflections on the overall development of society. Social marginal benefits are clearly superior to the marginal private benefits.

Likewise, it can be said that education works in terms of the security and safety of a higher level of income. Individuals with higher levels of education perform usually better paid professions, increasing levels of disposable income, which offset, in terms of potential demand, the demographic problems of steep decline of the workforce in countries where the "Welfare State" works the best. The existence of higher income levels are still an important support for obtaining funds for the governments, through taxes and other fees, which keep the public social policies (including education, itself).

We may also apply the multiplier effects of education and research and development on the endogenous growth of countries as well as the multiplier effects on consumption of public goods (such as health or culture) that stem from the existence of a literate and educated population.

It should be noted that, from the perspective of the individual who has free (or lower cost than the actual price) education, there is a positive externality clearly identifiable in that their marginal benefit is clearly higher than its marginal cost because private compensation to society that is paid is not the equivalent of the benefit that results from increased individual improvement becoming from their training.

In terms of negative externalities it is also possible to highlight some aspects ranging from the exclusion of the non-qualified individuals of the new information societies (where the multiplicity of sources and forms of learning turns out to be a disadvantage for the "new illiterates" of the TICs-Technologies of information and communication); to the migration and plunder of the high qualifications from the developing countries to the developed countries, a veritable brain-drain that inevitably leaves the poorest and least developed countries disqualified.

In the same direction, we can identify the purpose of demonstration / imitation effect that lead to the adoption, by the poor countries, of the standards of rich countries with high consumption. That leads to the depletion of natural resources and to the jeopardizing of the sustainability of the development process. The globalization of culture

and education is, at this level, a factor of considerable importance.

Apart from the issue of the presence of externalities and their consequences in the poor functioning of the education market, we also highlight a key aspect concerning the shortcomings of the education market: their reduced transparency and the difficulties that arise due to problems of asymmetric information. In this sense, for some authors, the active intervention of the state is justified in this market.

In fact, education is a "merit" good and one of the reasons for the apparent dysfunction of the market is just the critical situation of being a good for which it is difficult to judge quality. Students themselves have difficulty in choosing. Government intervention is justified because the design of this choice is necessary. Information does not reach every consumer on equal terms. The very ability to decode the message that is associated with the "announcement" of educational available services is different between different social status levels.

Asymmetric information is still visible in that the responsible for educational provision have a more secure notion of the product quality they are offering, when compared to what it is provided to potential consumers. To this extent, students can be led to demand for lower-quality institutions or courses with few career options (with surplus students compared to the expected demand in the labor market, etc.). Therefore, the state should regulate the supply of education.

Moreover, throughout the training process, individuals may have needs that can only pay income in the future and raises the possibility of using the banking system. But for this system, probably the risk of these operations is high, given the amortization period to be extended and given the lack of knowledge about the future. Here, too, the intervention of "social management of risk" by the State is important.

Summarizing: The need to consider the effects of externalities, or the need to overcome the difficulties of a market with imperfections, all seem to be reasons to justify the Government regulation of education. How far can go the provision of education by the state ends up being more than a matter of financial resources available, and obviously an ideological issue that results from a more or less liberal view about the way we understand the activity of the agent - *State* in the economy and in the society.

4. The Efficiency *versus* Equity Issue. Local Provision of Education

As we said, the issue of education provision by the state cannot remain only in the eternal debate about the greater or lesser efficiency of the Government in allocating resources.

Admittedly, there are interesting arguments that seek to justify private provision of education as the

traditional arguments of the gains derived from price and quality competition and freedom of choice by consumers.

However, the main justification for state intervention in the education system comes to the aim of "raising the general level of education and training" that is intended in most modern societies. At stake here are issues of equitable distribution of income and development gains that the competitive economy has difficulties in securing.

We get both issues of social cohesion, between social groups or between different regions and locations.

At the bottom, the fundamental issue is how to ensure equal opportunities of access to education by the less privileged by not allowing their lack of means and any other access problems to create a situation of absolute impediment of realization of their capacities and of integration in the competitive economy. Somehow, we need a kind of positive discrimination that favors the least protected individuals, explicitly, in the system.

It is precisely in this level of "equalizing" opportunities that the regulatory activity of the state and public provision of education, are more justified. For this purpose the state may resort to various forms of assistance (see Chagas Lopes, 2004):

- Through the finance system, by using various social support alternatives, from "free" and universal education system, to school vouchers or school loans to pay in the long-term, scholarships, school residencies and other forms of social school support (food, transportation, etc.);
- Construction of the necessary educational infrastructure (schools, sports halls, libraries, roads, etc.);
- By seeking to combat school dropouts;
- Strategy to prevent the monopolization of the education market in certain areas of science and at various spatial scales (national, regional, local);
- By direct intervention in the management of schools and regulation of relations between public education and private education;
- Production of information relating to the education system and its dissemination;
- Through the legislative process: taking explicitly a positive discrimination to the poor, facilitating, for example, certain types of access to several areas and levels of education services.

In the local context, these issues of equity in the market access and of public provision of education services can take an interesting shape. Several issues are to be answered. Is it justified the public provision of education at the local level? On what level(s) of education? Why? With what fundament? What is the role of local government in the quality of the education system? What are the problems that the local authorities face in these areas? What are the

difficulties in the relationship with central Government?

The usual answers in some tests to validate this analysis, in the Portuguese case (see Oliveira, 2007), enhance the justification of public provision of education at all levels of education, based on criteria of fairness - "that all citizens have access to education." Secondly, the local Governments have usually assigned important responsibilities in terms of primary education (Kindergarten and 1st cycle), coming this public provision of education services to play an important role, especially in matters of school transport, school social work, maintenance of infrastructure and support for complementary activities (as after-school activities). These skills involve important financial resources in the local context. Likewise, it is called the attention for the critical tension between the Central Government "that only distributes responsibilities to local power" but does not accompany this devolution of powers in the education sector with the "decentralization" in financial terms.

5. Concluding Remarks

The public (or semi-public) good nature of education and the presence of externalities in the production and consumption process in the education market can lead to situations where the market can be driven to solutions that are not socially efficient. That's an important reason to defend the public provision of education.

But there is also a role to be developed by the private school, in this market. The questions are to be put in terms of price and quality of the service, but also on equity grounds, the more or less universal access to the benefits of education being the central issue.

Locally, the economic analysis points to an important public role in the provision of educational services, especially at the level of basic education. The justification for public provision based mainly on grounds of fairness, "equality of citizens' access to education." There are still some problems in the complex relationship between Central Government and Local Government with regard to financial issues, including the adequacy of transfers of funds to the local institutions to enable them to cope with the new powers that are being conferred in the fields of Education.

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