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Welfare Economics and Neoliberalism: Interpreting the ideal type of perfect competition general equilibrium

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Welfare Economics and Neoliberalism
Interpreting the Ideal Type of Perfect Competition General Equilibrium

Abstract

Both institutional economists preparing public policies and academic economists evaluating them keep the premise of perfect competition markets as reference, despite market failures are broadly acknowledged. Actually, a large bunch of economic research has explored deviations from the ideal-type (imperfect competition or information, positive or negative externalities, poverty traps, bounded rationality…). Yet, this large literature keeps the ideal-type of perfect competition general equilibrium as the reference to which are compared more realistic models and toward which are supposed to tend actual economic organizations, thanks to the proposed public policies. Mainly, the virtual reference of perfect competition markets is considered as efficient, but not attained because of market failures: the aim of public policies is then to intervene to close the gap between actual market allocation and this supposed efficiency. The present article aims at understanding the characteristics of this dominant ideal-type, and specifically what is called efficiency. It analyzes: i. the way the concept of Pareto optimum is interpreted as an efficiency criterium; ii. the mechanisms through which the market process is supposed to lead to a Pareto optimal situation; iii. which one is selected amid the multiple potentially Pareto optimal situations. It allows to conclude to a false interpretation of efficiency of perfect competition, which is essentially a mechanism of gathering information by weighting individual preferences in proportion to their purchasing power. The use of perfect competition as reference and the limit of the concept of efficiency are illustrated through examples of public policies, notably green taxes.

Keywords: Economic Methodology, Government Policy, Provision and Effects of Welfare Programs, Comparative Analysis of Economic Systems.

Introduction

Both institutional economists preparing public policies and academic economists evaluating them keep the premise of perfect competition markets as reference, despite market failures are broadly acknowledged. Actually, a large bunch of economic research has explored deviations from the ideal-type (imperfect competition or information, positive or negative externalities, poverty traps, bounded rationality…). Yet, this large literature keeps the ideal-type of perfect competition general equilibrium as the reference to which are compared more realistic models and toward which are supposed to tend actual economic organizations, thanks to the proposed public policies. Mainly, the virtual reference of perfect competition markets is considered as efficient, but not attained because of market failures: the aim of public policies is then to intervene to close the gap between actual market allocation and this supposed efficiency.

In this context, the use of intervention through incentive rather than coercive policies has increase in most western countries since four decades (Morel et al., 2018; Adema et al., 2011, 2014), because it is supposed to correct market failures while keeping as much as possible the principle of market allocation. This trend has been first identified in the US under the concept of hidden welfare state (Howard, 1997) then spread out in Europe (Morel et al., 2019). Such conception of public policy has been defended by economists since the beginning of the XXth century for correcting market failures due to externalities (Pigou, 1920). It is now generalized to a large share of state interventions, from environmental policies to housing, employment, health, poverty fighting, education and research (Carbonnier et al., 2023).

This trend is linked to liberalism recovery after post-WWII planification years, associated to the strong believe that market process is the best mechanism to coordinate productive actions. However, the first waves of liberalism of the XVIIth and XIXth centuries have demonstrated the impossibility of self-regulating market systems; hence, the recent wave of liberalism mix market allocation with strong state interventions, but state interventions not replacing markets but aiming at actually setting more market processes. This follows the concept of neoliberalism as presented by Michel Foucault (1979) and widely documented since (Campbell & Pedersen, 2001; Amable, 2017).

From an economic theory point of view, the base for such public policies may be found in the information economics, as a revival of the welfare economics with taking account of market failures, mainly due to asymmetrical or imperfect information (Akerlof, 1970; Spence, 1973; Rotschild & Stiglitz, 1976; Shapiro & Stiglitz, 1984) or imperfect competition (Tirole, 1988; Laffont & Tirole, 1993). Actually, the neoclassical general equilibrium theory remains the standard frame to analyze economic issues. A large bunch of economic research have explored the deviations to this ideal-type model (imperfect competition or information, positive or negative externalities, poverty traps, bounded rationality…). This literature keeps the ideal-type of perfect competition general equilibrium – the neoclassical ideal-type – as the reference to which are compared more realistic models, and toward which are supposed to tend actual economic organizations thanks to the proposed public policies.

This literature builds on the Welfare Theorems interpreted as an equivalent for the invisible hand concept of Adam Smith (1776) within the frame of neoclassical theory. The basic idea is that a set of markets is the best way to gather individual information in order to coordinate decentralized agents' behavior. This view, central to neoclassical theory – is more widely the foundation of liberal thought, as clearly expressed by Friedrich Hayek, which is a liberal economist firmly opposed to neoclassical models:

Even the single controlling mind, in possession of all the data for some small, self-contained economic system, would not – every time some small adjustment in the allocation of resources had to be made – go explicitly through all the relations between ends and means which might possibly be affected. (...) Fundamentally, in a system where the knowledge of the relevant facts is dispersed among many people, prices can act to coordinate the separate actions of different people in the same way as subjective values help the individual to coordinate the parts of his plan. (...) The whole acts as one market, not because any of its members survey the whole field, but because their limited individual fields of vision sufficiently overlap so that through many intermediaries the relevant information is communicated to all. (...) We must look at the price system as such a mechanism for communicating information if we want to understand its real function.[1]

Yet, neoclassical theory has broadly defended the same agenda and actually brought this view dominant in the economic debate. Particularly, the Welfare Theorems are an incomplete set of theoretical results within the neoclassical ideal-type, driving the way state should regulates the productive activities. The first theorem states that under perfect competition hypotheses, market process should lead to a Pareto optimal equilibrium. The Pareto optimal concept is commonly interpreted as an efficient situation (the present article proposes to discuss this assumption by further understanding the practical consequences of this theoretical concept) but not always a fair situation, knowing that there exists a large number (infinity) of potential Pareto optima. This leads to the second theorem stating that any Pareto optimum may be attained by a perfect competition market process, according to an adequate initial distribution of resources. This has been commonly interpreted as the fact that public policies should aim at setting the adequate initial distribution of resources then letting the market process leads to the Pareto optimum collectively chosen. The search for a third theorem, presenting the way this collectively chosen optimal situation should be selected, resulted in an Impossibility theorem (Arrow, 1951; Satterthwaite, 1975; Gibbard, 1977), which can be interpreted as the fact that rational and objective economic analysis cannot substitutes political debate. Even if collective decision literature investigates further the conditions under which the impossibility of "objective" collective decision holds, the applied literature comes back to more "subjective" conceptions through Bergson-Samuelson welfare function and Cost-Benefit Analyses (Cherrier & Fleury, 2017).

The result of such conception of policy is well synthetized by the Musgrave (1985) presentation of public intervention in three missions: i. redistribution (consisting in changing the allocation to reach a fair equilibrium); ii. stabilization (correction of market failures at

[1] Hayek (1945), pp. 525-526.

macro level); iii. correction of market failures (at micro level: the neoliberal policies presented above). Even if considering the need for (strong) public regulation, the dominant view about public intervention assumes that competitive markets set an efficient (and even somewhat fair) equilibrium and that the goal of collective non-market actions should only be to permit the market process to occur.

The aim of the present article is to discuss this underlying assumption of efficiency of market processes and to test how underlying believes in this efficiency has been qualitatively modified in the (indirect) transition from liberalism to neoliberalism. That for, the purpose is not to argue that perfect competition does not exist (which is a tautology as this concept of perfect competition has been built as a theoretical ideal-type). First, this paper aims at understanding in which sense the perfect competition market allocation is considered as efficient and what are the dimensions of this efficiency (allocative, productive, distributive). Second, the heterogenous neoliberal policies are investigated in relation to the way they aim at correcting some market inefficiencies through the deep faith that it allows to benefit from market efficiencies.

Consequently, the present article analyzes: i. the way the concept of Pareto optimum is interpreted as an efficiency criterium; ii. the mechanisms through which the neoclassical ideal-type of perfect competition general equilibrium is supposed to lead to a Pareto optimal situation; iii. which one is selected amid the multiple Pareto optimal situations. It allows to conclude to a false interpretation of efficiency of the perfect competition market process, which is essentially a mechanism of gathering information by weighting individual preferences in proportion to the purchasing power. Then, the main recent policies, and particularly those considered to constitute the base of the neoliberal transformation of western societies, are analyzed in relation to this theoretical framework. It allows to show how neoliberalism – amid its heterogenous version – keeps faith in all the dimension of market efficiencies.

In order to present this analysis, the article is structured as follows. Section 2 presents the theoretical characteristics of Pareto optima at three levels: i. allocative efficiency (what goods to produce?); ii. productive efficiency (which factors to use for each specific production?); iii. distributive efficiency (how to distribute the goods and services for consumption?). Section 3 translates from formal concept to practical effect, interpreting the market process characteristics in terms of decisions about these three questions. Section 4 applies this interpretation to actual public policies to analyze which types of efficiency are meant to be attained by market each process and which types are meant to be corrected by state intervention. Section 5 concludes.

I. Standard principle of market allocation

1.1. General equilibria and Pareto optimum

Criticizing previous ways of measuring welfare, mainly through the use of marginal willingness to pay (MWP) (Dupuit, 1844; Marshall, 1890), Vilfredo Pareto (1906) proposes an objective process to compare economic situations from a collective point of view. MWP was thought to measure welfare generated by consumption following the simple idea that, at the individual level, the greater the expected welfare from a consumption, the larger the MWP for that consumption (section 4.1 comes back to that use of MWP that still predominates today, particularly in cost-benefit analyses). However, MWP does not depend only on welfare generated but also on the purchasing power, and Pareto noted that there exists no universal measure of individual welfare: the translation from actual welfare of different individuals to some measurable value cannot be homogenous, as if comparing distances with measures operated with different meter scales.

The problem Wilfredo Pareto faced was the following: the economic literature seeks an "objective" mechanism to compare economic situations; the objectivity being here conceived from the point of view of the economist proceeding to the comparison. From the methodological individualism perspective, the objectivity is obtained by basing the comparison on individual preferences, without overweighting the preferences of one individual upon others (or with "objectively" chosen weights). Yet, as there is no objective measure of the intensity of individual preference (since the MWP has been rejected), it is not possible to compare one individual preference to another, which limits the faculty of comparing economic situations involving several individuals.

In a formal presentation, the only "objective" statement about a couple of economic situations – say ES1 and ES2 – is that ES1 is objectively collectively preferred to ES2 if at least one individual strictly prefers ES1 over ES2 and nobody strictly prefers ES2. This has been considered as a non-waste measurement: if actually two such situations exist and ES2 is collectively chosen, then the potential welfare of the individual strictly preferring ES1 is wasted as it is lost without any other individual benefiting from this choice. The main problem of this criterion is that it defines a partial order: some couples of situations are comparable (one dominates the other or the two are indifferent) but some other couples (the vast majority) are simply not comparable. Hence, this criterion does not define a unique optimum but a (infinite) number of local optima, which are situations dominated by no other situation but which cannot be compared with the other Pareto optima.

Here, the second welfare theorem states that all Pareto optima are potentially attainable by market processes but the impossibility of a third theorem prevents from defining an "objective" process for choosing a particular Pareto optimum. A large amount of literature tries to develop practical mechanisms – such as for example the Kaldor-Hicks criterion based on the propositions of Kaldor (1939) and Hicks (1939) – but they only in appearance solve

the objectivity problem as they are actually based on the MWP (this question is further discussed in section 4.1).

Consequently, the question of the Pareto optimum objectively and collectively preferred cannot be solved but the first welfare theorem states that perfect competition markets set an actual Pareto optimum, which is interpreted as the efficiency of market process (as Pareto optima are interpreted as non-waste or efficient situations). A first question asked in the present article is: which Pareto optima is it? To answer this question, it is necessary to understand how markets gathered information – from Hayek (1945) point of view – to realize the coordination of individual actions.

1.2. Understanding why perfect competition general equilibrium is a Pareto optimum

Before answering this question, it is essential to understand the reason why the neoclassical ideal-type should lead to a Pareto optimum, since that mechanism is the source of the interpretation of the way information is gathered by markets. It is also essential to understand that the Pareto criterion is not as tautologic as it may appears when considering the definition for the first time. Several kinds of efficiencies are actually at stake in a productive system:

i. Allocative efficiency: what goods to produce?

ii. Productive efficiency: which factors to use for each good production?

iii. Distributive efficiency: how to distribute the goods for consumption?

Because the reasoning of the general equilibrium is general, these three types of efficiency are strongly related. Distributive efficiency is obtained through the confrontation of individual demands, that collectively impact the choices of production, which is allocative efficiency. However, as analytic tools, these three types of efficiencies may be scrutinized one by one (keeping in mind their interdependency). The theoretical mechanisms leading to these efficiencies are presented just below and next section analyzes the social situation generated by such a market allocation.

<u>Distributive efficiency</u>

Let us take the efficiencies in reverse order and begin with the distributive efficiency. Material waste is the simplest inefficient distribution but distributive efficiency is a more complex notion. Consider another rough example: two individuals have to share potatoes and butter (only distribution is considered here as production is analyzed below). If individual I1 has all the potatoes and no butter and individual I2 has all butter but no potato, the distribution is obviously inefficient even in the absence of any material waste because both individuals would be better-off if they exchange a share of their endowment.

Actually, the distributive efficiency in the sense of Pareto would be attained if the distribution of potatoes and butter is such that no exchange may be mutually advantageous. Yet, consider the marginal rate of substitution (MRS) which is, for that initial distribution, the limit exchange rate that improves the situation of an individual: if her MRS is 2, her situation improves if she decreases her consumption by one pound of butter but increases her consumption by two or more pounds of potatoes; alternatively it improves if she decreases her consumption by one pound of potatoes but increases it by one half or more pound of butter. The only way there exist no mutually advantageous exchange is that the MRS of both individuals are equals[2].

Yet, the market process induces that each consumer allocates her budget so that she optimized her preferences. The result of the individual optimization process is that the final consumption decision is such that her MRS is exactly equal to the relative price of butter over potatoes. Indeed, if MRS is lower than this relative price p, the consumer could improve her situation by consuming one pound less of butter and p > MRS pounds of additional potatoes; if MRS is larger than this relative price p, she could improve her situation by consuming one pound less of potatoes and 1/p > 1/MRS pound more of butter.

As it is assumed that marginal utility decreases with consumption (one additional pound of butter is less and less useful) substituting potatoes to butter decreases marginal utility of potatoes and increases marginal utility of butter and hence increase the marginal rate of substitution; conversely, substituting butter to potatoes decreases marginal utility of butter and increases marginal utility of potatoes and hence decreases the marginal rate of substitution. Yet, it is actually possible for a consumer – and in her own interest – to allocate her budget to potatoes and butter in such a way to equalize her MRS to the relative price. Given that the relative price in a perfect competition market is the same for all consumers, the equilibrium (after adjustment of the supply) is such that the marginal rates of substitution of all consumers are equal (and equal to the equilibrium relative price) and so that no further mutually advantageous exchange is possible.

Productive efficiency

The concept of productive efficiency is actually very close to those of distributional efficiency, with the transposition from consumers to producers: production factors replace consumption goods; marginal productivity of factor replaces marginal utility of consumption; technical marginal rate of substitution (TMRS) between production factors replaces marginal rate of substitution (MRS) between goods. As for the distributive issue, a situation where one plant gets only machines and another only machine operators would not be productively efficient.

[2] The demonstration is straightforward. Consider an initial situation where MRS1 of individual 1 is greater than MRS2 of individual 2 and consider any exchange rate r strictly between MRS1 and MRS2. If individual 2 gives one pound of butter to individual 1 in exchange for r pounds of potatoes, both situations are improved: as MRS1 > r > MRS2, individual 2 gets more than MRS2 pounds of potatoes in exchange for one pound of butter; for individual 1, the ratio of butter she gets per pound of potatoes she gives is larger than 1/MRS1 as 1/MRS1 < 1/r < 1/MRS2. Hence, the only way not to have any mutually advantageous exchange is that MRS1 = MRS2.

Nor would be productively efficient the situation where the obstetrician possesses a blackboard and the economic teacher a scanner.

The Pareto efficiency would be to allocate the production factors in such a way that it is not possible to increase the production of two firms by switching some factors between them. For the same reason as this implies the equality of MRS between all consumers in the distributive efficiency case, the productive efficiency implies the equality of TMRS between all firms. Yet, perfect competition ensures this because profit seeking leads each individual firm to equalize its TMRS to the relative price of factors (by the same mechanism individual consumers equalize their MRS to the relative price of goods).

Allocative efficiency

The allocative efficiency concerns the allocation of factors to the different goods that could be produced. An inefficient situation could be for example to allocate all the productive resources to produce only (but a lot) of SUVs and no bread, although the population has no need to ride cross-country but is hungry. The Pareto condition for allocative efficiency would be that it is not possible to improve the situation of a consumer (without degrading the situation of any other) by replacing the consumption of a marginal quantity of one good (say good A) by the consumption of the marginal quantity of another good (say good B) which is possible to produce by the economies of factor permitted by the non-production of the marginal quantity of good A.

Marginal rate of transformation (MRT) referred to the ratio of marginal quantity of additional production of good B obtainable for each quantity of good A not produced. If the MRT is larger than the MRS of an individual, it is possible to improve her situation by actually marginally shifting the production from A to B: if the MRT is lower than the MRS, it is possible to improve her situation by actually marginally shifting the production from B to A, and vice versa. Such a change is marginal and does not impact other production, hence does not impact other individuals. Consequently, the Pareto condition is that MRT = MRS. Yet, at the perfect competition general equilibrium, the MRS of all individuals are the same and equal to the relative price. The MRT is the ratio of the marginal production cost since at the general equilibrium, firms cannot set margins above the marginal cost due to competition. As the price is equal to the marginal cost, the MRT is also equal to the relative price and to the common MRS of all consumers.

II. Allocation to means rather than needs

Now that the formal principles leading to conclude that the ideal-type of perfect competition general equilibrium should be a Pareto optimum, it is meaningful to look closely at what represent the different equations between the terms MRS, TMRS, MRT, and what are the assumed mechanisms leading to the aggregation of information. As for the presentation of the neoclassical basic theory, it is done sequentially.

2.1. Distributive efficiency

The mechanism ensuring the distributive efficiency is simply that through the system of prices, each individual orders her preferences through the order of purchases. In a way, the largest ratios of marginal utility over price (RMUP) are individually ordered and confronted through the demand sides of markets. A general decentralized process allocates the actual goods in order that only the highest RMUP of each individual are satisfied. The individual thresholds of RMUP are different for each consumer because the numerator – the marginal utility – is essentially subjective without any possibility of interpersonal comparison. Consequently, the question is how come the individual thresholds of RMUP are set by the decentralized process?

<u>Distributive efficiency as distribution according to purchasing power more than utility</u>

The distributive efficiency is ensured by the fact that no mutually advantageous exchange is possible, meaning that for two individuals 1 and 2 and two goods X and Y, MRS1X→Y = MRS2X→Y. Under the hypothesis of existence of a marginal utility (MU), it means that MU1X/MU1Y = MU2X/MU2Y and not at all that MU1X = MU2X and MU1Y = MU2Y. Hence if MU1X > MU2X, then MU1Y > MU2Y should hold in the exact same proportion, and identically for all goods. Actually, the neoclassical ideal-type assumes that MU1Z > MU2Z for any good Z with the ratio of the two inversely related to the purchasing power. Indeed, from an individual point of view, each marginal consumption (let us say each dollar of consumption to be simple) is ordered by the benefit of this consumption for the consumer, that is the RMUP of the share of good purchased with this dollar. A rational consumer, given her budget constraint, consumes the goods with the highest RMUP. Thus, the richer the consumer (with identical preferences) the lower the RMUP of its consumption (for all goods and services).

Another way of interpreting it is to come back to the partial equilibrium interpretation of Marshall (1890). Considering money as a good in the general equilibrium, there is also a price of money (equal to one by definition because one unit of dollar costs one dollar) and a marginal utility of money (MUM). Marginal utility of money of individual 1 is, at the optimum of her consumption program, the marginal utility she can buy with one dollar (with the best choice for using this marginal dollar). The largest the income, the larger the amount of necessary consumption already fulfilled before the marginal dollar, and the lower the marginal utility of the last dollar. Hence, the larger the income, the lower the marginal utility of any

consumption. In a way it is tautologic: markets do not allocate goods to consumers as a function of their level of utility but as a function of their purchasing power, leading to the situation where the marginal utility of the allocation of a rare good to a rich person (who can afford this purchase) is far lower than the marginal utility it would have provided to a poor person had this poor person been awarded the good. It was noticed by Dupuit (1844) in and strongly recalled by Marshall (1890) at the end of the XIXth century when presenting this use of marginal willingness to pay as a proxy to marginal utility:

In the same way if we were to neglect for the moment the fact that the same sum of money represents different amounts of pleasure to different people, we might measure the surplus satisfaction which the sale of tea affords, say, in the London market, by the aggregate of the sums by which the prices shown in a complete list of demand prices for tea exceeds its selling price. [...] The real worth of a thing might be discussed with reference not to a single person but to people in general; and thus it would naturally be assumed that a shilling's worth of gratification to one Englishman might be taken as equivalent with a shilling's worth to another, "to start with," and "until cause to the contrary were shown." But everyone would know that this was a reasonable course only on the supposition that the consumers of tea and those of salt belonged to the same classes of people; and included people of every variety of temperament. This involves the consideration that a pound's worth of satisfaction to an ordinary poor man is a much greater thing than a pound's worth of satisfaction to an ordinary rich man[3].

However, the use of willingness to pay to approximate marginal utility in comparison across social classes is still heavily used in economics, and specifically in socio-economic evaluation such as cost-benefit analyses (section 4.1 below). This draws important questions about the way some policies rely on market processes for allocating rare goods. It is particularly at stake concerning natural resources or pollution.

Distributive efficiency of the carbon tax

Emission permits or carbon taxes also aim at modifying the choice of productive processes (which concerns the productive efficiency analyzed in section 3.2) or even the choice of the type of goods produced (which concerns the allocative efficiency analyzed in section 3.3) but an important share of the goal is to distribute a limited level of pollution between a large number of consumers. Indeed, the principle of the carbon tax relies on following priors: the various polluting activities are more or less necessary; the global emissions must be reduced, as much as possible by reducing those superfluous and not the most necessary. Hence, whether under the arguments of freedom, informational efficiency or non-paternalism, a market is created (either officially within the framework of tradable permits or indirectly through the polluter-payer principle of green taxes) and the agents self-regulate: those who have the greatest willingness to pay to pollute continue to pollute and those who have the lowest willingness to pay stop.

[3] Marshall (1890), pp. 106-108.

In this context, the justification for using market mechanisms to regulate greenhouse gas emissions is not only (or not always) market fetishism but depends on efficiency arguments: markets are efficient because they allocate resources to the highest bidders. Since the idea is that a person bids more if she actually needs more the resource, the allocation to the highest bidders is assumed to be an allocation to the greatest needs. However, this reasoning is a shortcut and what the neoclassical ideal-type actually states is that the highest bidders can in fact be just the ones for whom an expenditure does not represent a significant utility cost as their marginal utility of money is low because they already possess everything they need and still have resources to spend.

In this sense, it is important to remember that the decision to leave it up to willingness to pay to decide who continues and who stops polluting is not the only possible mechanism. For example, in the similar case of summer droughts – where it is necessary to decide who will continue to consume water and for what activities – many countries choose not to increase the price of water such as the weakest willingness to pay stop consuming, but a political choice is put in place of which activities will continue and which will cease temporarily (filling individual swimming pools or watering private gardens for example). Otherwise, by principle of market allocation, poor people would give up washing themselves when rich people continue to water their begonias. This would be so not because the marginal utility of a poor person's hygiene is lower than that of a rich person's flowers, but because the opportunity cost (the utility lost from giving up another consumption to afford the purchase of water) related to the usefulness of the use of water, is higher for the shower of the poor than for the watering of the rich.

2.2. Productive efficiency

The productive efficiency – the way production factors are allocated and combined to produce goods and services – may be considered at several level: within-firms or between-firms.

Within-firm productive efficiency

Concerning the within-firm productive efficiency, the neoclassical ideal-type is not clear because this framework considers the firms as atomistic units of production, without considering the organizing issues. This leads to the famous critic by Coase (1937) and the development of the transaction cost theory. Actually, this debate is even older and can be relied to the Marx (1867) critic of the analogy between the different type of labor divisions in Smith (1776). In its famous book, Adam Smith starts by presenting in chapter 1 the case of labor division in a pin factory (which is an example of division of labor in the manufacture) as a motivation for further studying division of labor which he considers as the main engine of growth. But the rest of the book, and specifically as soon as chapter 2, presents the division of labor as the division of labor in the society or even the international division of labor. Karl Marx's critic is that division of labor in the manufacture or in the society are essentially different concepts, because the different tasks are coordinated by authority and engineering in the case of manufacture and by market processes in the case of society.

But in spite of the numerous analogies and links connecting them, the division of labour in the interior of a society, and that in the interior of a workshop, differ not only in degree, but also in kind. [...] What is it that forms the bond between the independent labours of the cattle-breeder, the tanner and the shoemaker? It is the fact that their respective products are commodities. What, on the other hand, characterizes the division of labour in manufacture? The fact that the specialized worker produces no commodities. [...] The division of labour within society is mediated through the purchase and sale of the products of different branches of industry, while the connection between the various partial operations in a workshop is mediated through the sale of the labour-power of several workers to one capitalist, who applies it as combined labour-power. The division of labour within manufacture presupposes a concentration of the means of production in the hands of one capitalist; the division of labour within society presupposes a dispersal of those means among many independent producers of commodities. [...] Division of labour within the workshop implies the undisputed authority of the capitalist over men, who are merely the members of a total mechanism which belongs to him. The division of labour within society brings into contact independent producers of commodities, who acknowledge no authority other than that of competition, of the coercion exerted by the pressure of their reciprocal interests, just as in the animal kingdom the 'war of all against all' more or less preserves the conditions of existence of every species[4].

Even if classical and neoclassical theories diverge strongly, the absence of consideration of within-firm decision mechanisms still hold in welfare economics. An imperfect competition literature – based on asymmetries of information analyses such as signaling (Spence, 1973) or shirking (Shapiro & Stiglitz, 1984) on the employees' side or principal-agents relation between owners and managers (Grossman & Hart, 1983; Holmström & Milgrom 1987) – has been developed but they are part of the analysis of market failure and hence deviation from the ideal-type of perfect competition. Consequently, it is not possible to understand the mechanism of within-firm productive efficiency of the neoclassical ideal-type since this notion actually lacks in this model. Hence, the focus is made on the between-firms productive efficiency.

Productive efficiency and factor remuneration

Between-firms productive efficiency assumes perfect within-firm efficiency (whether through authority, engineering or market process) and focuses on the choice of combination of factors: hence rely to factor markets from the demand side. Yet, similarly to the consumer case, it results in the equality for each factor and each firm of the ratio of marginal benefit (here marginal productivity instead of marginal utility) over factor's price. It implies that the remuneration of each factor is proportional to its marginal productivity, which is sometime thought as a kind of fairness principle due to a misunderstanding of what really is marginal productivity.

On that issue exists a large literature criticizing the neoclassical ideal-type because such model assumes that all factors are substitutable: in the absence of this assumption, the concept of

[4] Marx (1867), pp. 474-477.

marginal productivity cannot be defined. This debate over substitutability has taken the form of different specific debates, from the two Cambridge's debate on capital [5] to the debate over the impact of labor cost over unemployment[6]. However, these are critics of the ideal-type itself and lead to principles of imperfect competition although the present paper aims at interpreting – not criticizing – the ideal-type. Hence, let us assume that all types of labor are marginally substitutable to each other and to all types of capital and let us analyze what it means in terms of wage setting.

In such a model, the wage for a specific type of labor (a given job with a given qualification) should be proportional to the marginal productivity of this specific labor. This is – wrongly – interpreted as a fairness property of wage reflecting the actual contribution of the workers to the overall production. Yet, marginal productivity is actually the product of two terms, the material marginal productivity of an additional unit of labor (MMP) and the marginal commercial value of one additional unit of good (MCV). Indeed, under perfect competition, employer's arbitrage is such that one additional amount of labor paid (which costs the wage rate w) allows production of MMP additional units of goods each sold at MCV: if w < MMP*MCV, the employer's interest is to increase the workforce; if w > MMP*MCV, the employer's interest is to decrease the workforce; the resulting equilibrium being w = MMP*MCV. MMP and MCV deserve separate analyses.

First, MMP is not the contribution of the type of jobs to the overall material production (which would be average – and not marginal – material productivity) and strongly depends on the relative scarcity of the workers enable to provide the specific labor service. It is particularly true in the presence of decreasing marginal factor productivity, which is a necessary condition of the perfect competition model. Consequently, a low marginal productivity does not mean that the type of job is of low productivity, but that the supply for this specific labor exceeds what is needed given the quantity of the other production factors it should be assembled to. From an efficiency point of view, it may be interpreted as the sign that the job's type supply should be lowered (or the supply of other types should be increased); but it cannot be interpreted in the sense that the average productivity of the type of labor is low.

Second, interpreting MCV comes back to the price of a unit of output and hence to the willingness to pay of customers. From that perspective, it comes back to the interpretation of the previous subsection on distributive efficiency: it reflects the marginal need (the need for

[5] To be mutually substitutable, different kinds of capital should be of the same nature (the unique type of capital K in the neoclassic model of Cambridge, USA) although they are qualitatively different and complementary (Cambridge, UK).

[6] If all production factors are marginally substitutable (and labor markets are coordinated by perfect competition), then the use of each factor is such that relative marginal productivity equals relative marginal costs (relative prices) and a factor's price directly impacts its used volume (employment for the case of labor). At the opposite, complementarities (at least at the marginal level) implies an absence of impact of price on volume and lead to a distributional rather than employment impact of wages. A large empirical literature since the 1970's argues for the second assumption, see Carbonnier & Palier (2022) for a meta-analysis of empirical studies and Carbonnier (2020) for a theoretical analysis of the importance of substitution in the standard labor market framework.

an additional unit of the good or service) weighted by the purchasing power of the potential consumers of this additional good or service.

Interpreting the model from a dynamic perspective (which means that environment is permanently changing, and market forces tends to adapt the production decisions), the process should lead to reallocation of workforce (and other capital factors). But if substitution elasticity in the qualitative type of workforce is low (which is a reasonable assumption given cognitive abilities to learn at different ages), the wage should depend on actual average material productivity but also on the relative abundance of workforce needed relative to the level of demand and the willingness to pay of customers.

The case of care activities may be an interesting illustration of these relationships. Such activities are meant to be very useful but provide very low wages to the workers. This were true long before, but the recent Covid-19 pandemic highlighted this paradox (Palier, 2021). Of course, this paradox is also linked to market imperfections and the role of public policies (Carbonnier & Morel, 2015), gender discrimination (Lewis, 1992; Molinier, 2013) or the actual possibility to defend collectively workers' interests against a monopsony employer (Devetter & Puissant, 2018). Nevertheless, the pure market mechanism contributes to the explanation of the paradox.

Care services are actually needed by the whole population, which means that it provides a large marginal utility (MU) to the potential consumers. However, most people cannot afford such services. Hence, the curve of willingness to pay with respect to quantity start high (large MU and large purchasing power of wealthy people) but decrease steeply due to budget constraint (but not to MU decline). Hence, even if the workforce is very productive in material and utility terms and even if the service supply is scarce relatively to the needs of the population, the MCV is low as soon as the workforce is large compared to the affordable demand. Consequently, the equilibrium should lead to relatively low prices (and consequently low pay for actually necessary and productive workers) for rich consumers to consume very useful services cheaply. This questions the actual productive efficiency in the neoclassical ideal-type and highlights the double interest to inequality of rich people (Carbonnier & Morel, 2015, 2018; Carbonnier & Palier, 2022): they have high income to purchase personal services and low competition from the demand side, resulting in low prices.

Between-firms productive efficiency and supply organization

Another important characteristic of perfect competition is the existence of what Marshall (1890) called a "quasi-rent" as a reference to the rent of Ricardo (1817). This occurs because the marginal costs of production are heterogenous between the suppliers and the perfect competition price is set at the marginal cost of the lowest productivity firm necessary to fill the demand. The efficiency interpretation of this is that the price should be at the highest marginal cost in order to attract enough suppliers to fill the demand, and firms more productive than the marginal firm are rewarded for their highest productivity. They are supposed to be rewarded for their investment in innovation allowing to improve their productivity, but of

course it may also be a situation rent, as in the initial case of "natural" land fertility in the case of the Ricardian rent.

For illustrating this, the case of the energy mix is interesting. The electricity output is very homogenous as it is normalized in terms of electric power and frequency. Yet, the sources are heterogenous, not only because some providers are able to be more productive than others, but also because the different technologies have other characteristics than pure marginal cost, which made some low productivity technologies useful to the energy mix (for example because they are more flexible and hence a good choice for peak periods). Consequently, the rent of base-providers during peak periods is not a reward for their contribution to productivity but a pure situation rent. Even more, this situation rent may generate a misallocation of productive resources as it incentivizes too much base-period technology (BT) and not enough peak-period technology (PT).

A simple model may illustrate this phenomenon. Assume a simple situation with a demand varying between the peak periods (with a need for high capacity H) during a share s of the time and base periods (with a need for low capacity L) the rest 1–s. BT is less costly than PT (marginal cost $l < h$) but PT is needed for flexibility motive. A way of modeling it is to consider that: i. BT capacity costs the same if actually producing or not whereas PT costs only when it works; ii. the marginal costs and peak share are such that the use of PT is efficient. The second condition is equivalent to $s.\alpha.h + (1–\alpha).l < l$ for at least a share α of peak-period production operated by PT: it is equivalent to: $s.h < l$. In that case, the efficient use of disposable technologies is a capacity L of BT and a complement level H–L of PT, with an efficient global cost $GCe = L.l + s.(H–L).h$.

The perfect competition market would be at marginal cost price. It is l during base periods and whether h or l during peak periods depending on the supply structure. Actually, it cannot be l as it would mean that BT capacity is H with a total revenue of $l.[(1–s).L + s.H]$ and a cost $l.H$, hence a negative profit $\Pi fullBT = l.(1–s).(L–H)$. Consequently, the price is h during peak periods to attract PT to the market. If the capacity allocation were efficient, it would be L capacity of BT and H–L capacity of PT for a global price $GCc = l.(1–s).L + h.s.H = GCe + (h–l).s.L > GCe$. The overpricing comes from the situation rent of BT during peak periods: these providers are overpaid not because they actually contribute to the society but because their situation made them available for rent during peak periods.

Nevertheless, the perfect competition would not allow this rent which would be erased by free entry. Actually, in a perfect competition ideal-type, the possibility of rent attracts new BT providers, until the rent is totally erased, which corresponds to a BT capacity C such that $\Pi C = l.(1–s).L + h.s.C – l.C = 0$. This is equivalent to $C = L.(l–l.s)/(l–h.s) > L$. Consequently, the perfect competition allocation is not efficient as it attracts too much BT and not enough PT. The reason is that the marginal cost pricing provides undue rent to BT which can only be erased by an overproduction of BT.

2.3. Allocative efficiency

Perfect competition ideal-type promote allocative efficiency because the investors' arbitrage in the one hand (comparing marginal rate of transformation – *MRT* – between two goods or services with their selling prices) and the consumers' arbitrage in the other hand (comparing marginal rate of substitution – *MRS* – between the two same goods or services) lead to the equality between *MRT* and *MRS*. It is supposed to manage the production (through the investment decisions between the different industries) in the interest of the customers (their preferences being reflected by their *MRS*). As presented in section 3.1 on *MRS*, it corresponds to investment decisions aligned with the average preferences of consumers weighted by their purchasing power.

As often, there may be some internal and external critics to the efficiency of the process. From the external point of view, the actual rationality of preferences may be contested on argument of social construction of preferences (Bowles, 1998). Some consuming behaviors, and consequently social aggregation of preference realizations through *MRS*, may be driven by advertising impact (Galbraith, 1958, 1967) or by the will to ensure the public expression of social position through consumption (Veblen, 1899; Frank, 1985) rather than actual individual needs and welfare. In such a context, advertising or social comparison processes may lead to demand bubbles for goods the production of which concentrats the scarce production means although they actually provide a low level of welfare to the society.

But this is an external critic and the present paper aims at interpreting the neoclassical ideal-type. From an internal point of view, investment decisions aligned with the average preferences of consumers weighted by their purchasing power may also lead to inefficiencies. One example may be the determination of medical research fields: research to cure metabolic syndrome or malaria. What really drive the allocation is not the actual utility of the treatments but the willingness to pay of people suffering from malaria or metabolic syndrome. One counter-argument may be that the example presents an unfair but not an inefficient situation in the sense that the actual decision to allocate medical research toward metabolic syndrome rather than malaria is actually economically efficient as it provides the highest economic value as measured by commercial value (or GDP). However, this would be circular reasoning: the question should be to test if profit-maximizing processes ensure efficiency from the society point of view and not from the profit maximizing point of view. The former questions the efficiency of market process to coordinate productive activities, the latter only questions the coherence of market processes regarding their own goals.

III. From liberalism to neoliberalism

The normative power of the neoclassic ideal-type seems to have fade out since the two world wars and the great depression. It is however a false feeling as it is only the belief in the possibility of a set of perfect competition markets which has disappear. The faith in the efficiency properties of market processes – through this ideal-type conception of markets – still drives public policies in post-industrial societies. Foucault (1979) has shown how, since the late 1930's and more heavily during the three post-war decades, the neoliberalism movement has rescheduled public policy and public intervention. Neoliberal thought does not seek to promote the *laissez-faire* but can defend a relatively significant interventionism. However, the fundamental purpose of this interventionism is not to substitute non-market mechanisms to market mechanisms, but on the contrary to extend the domain of market mechanisms. "*Because actually, what is competition? It is absolutely not a given of nature. (...) Competition as an essential economic logic will only appear and produce its effects under a certain number of conditions which will have been carefully and artificially arranged*."[7] Rejecting pure *laissez-faire*, the neoliberal thought keep faith in the virtue of competition understood in an ethos of individual responsibility (Amable, 2011).

Nevertheless, the neoliberal movement is very heterogenous and Foucault (1979) developped on the differences between the German ordo-liberalism and the Austro-American ultra-liberalism. As a school of thought, welfare economics also contributes to the rise of neoliberalism as it recognizes market failure but promote market processes to correct them. In this way, it keeps the ideal-type of perfect competition as the main horizon, considering that the aim of governments is to close the gap between the actual set of imperfect markets and the ideal-type. Yet, governments mainly build upon this economic theory to justify their neoliberal reforms.

In the present section, the influence of the neoclassical ideal-type on neoliberal policies is discussed. First is discussed the way to decide objectively if an intervention actually improves the economic situation from a collective point of view: it is shown that such criteria are based on the neoclassical ideal-type. Second, some of the main public interventions in post-industrial countries are presented in their aim at benefitting from respectively allocative, productive and distributive market efficiency.

3.1. How to choose the "good" Pareto optimum?

From an internal point of view, welfare theorems are incomplete. Indeed, the first theorem states that perfect competition leads to one among many Pareto efficient situations, and the second theorem states that all the Pareto efficient situations may be attained by perfect competition process, but the third theorem – whose aims would have been to determinates objectively which Pareto optimum should be targeted – failed in the impossibility theorem of Arrow (1945). Considering in addition the problem of actually implementing the method for aggregating individual preference, Satterthwaite (1975) and Gibbard (1977) derived similar impossibility results. This left the choice whether to choose the targeted Pareto optimum through

[7] Foucault (1979), pp. 123-124 (authors' translation).

external principles of justice (*i.*) or to rely market processes by accepting the actual Pareto optimum resulting from the allocation of production means inherited from the past, potentially amended by some (very partial) redistributive policies (*ii.*).

The former solution (*i.*) leads to the development of theories of justice. Rawls (1971) is probably the main cited philosopher of justice, his analysis considers an equal distribution of "primary goods" and a difference principle accepting well-being differences if they allow a better situation for the worse-off individual. This has been abusively considered to apply to standard literature through the myth of trickle-down theory: Mankiw (2013) develops the argument of the entrepreneur generating by itself an increase of well-being for the entire society and benefiting from a huge profit from that innovation; interrogating neither the actual individual paternity of the innovation nor the affirmation that the innovation would not occur without that huge amount of inequalities in the distribution of the benefice of this innovation. Independently from such misinterpretations of the difference principle, philosophers developed on the actual composition of the primary goods bundle, including talents and handicaps (Dworkin, 1981), which leads to the capability theory (Sen, 1985) and the principle of equality of opportunities (Arneson, 1989; Cohen, 1989). Yet, such theoretical principle is actually complex to implement, even without considering moral hazard due to redistribution (Fleurbaey, 2008).

Nevertheless, these principles of justice had few normative influences on actual economic governance, noticeably less than the perfect-competition ideal-type and the confidence in market processes (*ii.*). Yet, the neoclassical economic analysis attempted to bypass the impossibility theorem by creating criteria as objective as possible to drive the collective choice between several Pareto optimal potential situations. A first attempt occurs even before the impossibility theorem through the Kaldor-Hicks criterion. More recently, the practical method of cost-benefit analysis has been widely used.

<u>The Kaldor-Hicks criterion</u>

After the proposition of measuring welfare by the marginal willingness to pay by Marshall (1890) and the critic of the impossibility to compare inter-individually such utility measures – by Marshall himself (see the citation above) then by Pareto (1906) – the problem of normative economics has been to find a criterion to decide "*from an objective point of view*" which one of two economic situations is collectively preferable, as presented by Tibor De Scitovsky:

> *Modern economic theory draws a sharp distinction between positive economics, which explains the working of the economic system, and welfare economics, which prescribes policy. In the domain of welfare economics, the impossibility of interpersonal utility comparisons has for a long time been believed to impose strict limitations on the economists, which kept this branch of economic theory in the background. Recently however, there has been a reawakenning of interest in welfare problems, following assertions that these limitations are less restrictive than they were hitherto supposed to be.*[8]

One main contribution in that view is the Kaldor-Hicks' criterion:

[8] Scitovsky (1941).

> *You cannot take a temperature when you have to use, not one thermometer, but an immense number of different thermometers, working on different principles, and with no necessary correlation between their registration. (...) We may list three possible ways of dealing with it, two of which have to be rejected as unsatisfactory. One is to replace the given thermometers (the scales of preference of the individuals by a new thermometer of one's own. The investigator himself decides what he thinks to be good for society, and praises or condemns the system he is studying by that test. This is the method which is rightly condemned as unscientific. It is the way of the prophet and the social reformer, not of the economist. Secondly, one may seek for some way of aggregating the reports of the different thermometers. This is the traditional method of Marshall, Edgeworth and Pigou. The fundamental reason why it cannot be accepted is that it is impossible to arrive at an aggregate without "weighting" the component parts and in this case there is no relevant reason why we should choose one system of weights rather than another. (The equal weights, 1, 1, 1… are just one possible system of weights like the rest.) As a matter of fact, when they are composing their aggregate, Marshall and Pigou pay no attention to variations of the marginal utility of money between rich and poor – a point which, on their own principles, ought plausibly to be taken into account. Thus although their method can produce results, the significance of those results remains quite uncertain. The third method is Mr Kaldor's.*[9]

The first method is sentenced by John Hicks without mitigating circumstances. However, such a method not always reflect the will of a (more or less) enlighten dictator: it can emerge from deliberations, democratic or from experts. Coming back to the example of water shortage, a practical method is generally used in democratic countries to avoid a system of variable price driving the allocation of remaining water to the highest bidders: targeted limitations of activities. Another example is the decision on the allocation of transplants to the patient's list. It is often decided by the public health authority based on medical criterion – such as compatibility or probability of success of the transplant – and priority principles which rely on normalized values (life expectancy and disabilities) and not the individual subjective utilities. Such mechanisms are probably not perfect and deserve further ethical debate but they are not less efficient than markets for transplants.

The second method presented by John Hicks is the simple use of economic surplus, whose critic is presented above. During the XXth century, economists extends this principle by considering cardinal welfare functions being the sum of functions of individual utilities. Following Bergson (1938) and Samuelson (1947), the main cardinal welfare function essentially consists in weighting the individual utility functions before summing them. This is widely used, for example in the literature of optimal taxation following Mirrlees (1971) and Saez (2001).

The third method pointed by John Hicks is the compensation principle, today known as the Kaldor-Hicks criterion:

> *There is no need for the economist to prove – as indeed he never could prove – that as a result of the adoption of a certain measure nobody in the community is going to suffer. In order to establish his case, it is quite sufficient for him to show*

[9] Hicks (1939).

> *that even if all those who suffer as a result are fully compensated for their loss, the rest of the community will still be better off than before.*[10]

The principle is actually older and Enrico Barone proposes a similar principle in 1908, few times after Pareto's (1906) critics:

> *That is to say, some individuals will be benefitted, others will suffer loss; the loss to the latter will be decidedly greater than the advantage to the former, in the sense that even taking all their gain from those who have gained in the change (which takes them back to their former condition) and giving it to those who have lost by it, the latter, even with such an addition, remain in a worse situation than originally.*[11]

However, this method is much less miraculous than it appears and suffers two main critics, one formal and one practical. The formal critic has been made by Tibor de Scitovsky (1941), and relies in the reversibility of the criterion. Starting from a situation *A* and testing if situation *B* could be collectively better, the Kaldor-Hicks criterion considers than *B* dominates *A* if there exists a set of transfers from winners to losers of the reform such that nobody is opposed to the reform. A dual criterion would be that *A* dominates *B* if there exists a set of transfers from losers to winners of the reform such that nobody is opposed to the absence of reform. Yet, Scitovsky (1941) formally demonstrates that both may occur simultaneously. This derive mainly from the fact that the utility value of a given monetary transfer depends on the individual marginal utility of income, which itself depends on the individual situation. Because the reference situations differ between the two alternative criteria (*B* for the Kaldor-Hicks criterion and *A* for the dual criterion), so does the marginal utilities of income and the actual compensatory power of a given amount of monetary transfer.

The practical critic relies on the actual realization of compensation. In the citation above, Nicholas Kaldor seems to propose that economists should verify that compensation may exist but that the compensation does not need to be effective. However, he proposes that the compensation is actually realized when he exposes an example: this example is based on the abolition of corn laws, which has a negative impact on landlords and a positive impact on manufacturers:

> *But it is always possible for the Government to ensure that the previous income distribution should be maintained intact: by compensating the "landlords" for any loss of income and by providing the funds for such compensation by an extra tax on those whose incomes have been augmented. In this way, everybody is left as well off as before in his capacity as an income recipient; while everybody is better off than before in his capacity as a consumer. For there still remains the benefit of lower corn prices as a result of the repeal of the duty.*[12]

Even without considering the administrative and legal issue of how to realize the set of transfers, the issue of realizing or not the transfers is problematic in itself. If the reform considered contains – at least partially – a redistributive dimension, the realization of the compensations to the looser cancels the redistributive objective. In extreme cases it even constitutes immoral

[10] Kaldor (1939).
[11] Barone (1908) cited by Bradley and Mosca (2014).
[12] Kaldor (1939).

transfers, as in the case documented by Piketty (2020) about the Haitian debt due to France: after the 1804 actual liberation, France officially recognizes the independence of its former colony in 1825 (quickly followed by almost all other world powers) in counterparty to a large payment from Haiti, partly to compensates the slaveowners for the loss of their property. The debt initially amounted to over 300% of Haitian yearly national income at that time. The repayments of principals, interests and fees for late payments ended only in the 1950s.

Nevertheless, the absence of compensation is also an issue because the reason why Kaldor-Hicks criterion may work is that the utility value of the compensation is not the same for the payer and the receiver (for the same money value). The criterion actually states that situation *B'* (which is situation *B* plus the set of transfers) Pareto dominates situation *A*, from which situation *B* is declared dominating situation *A* according to the Kaldor-Hicks criterion. However, situations *B* and *B'* are actually different and cannot be compared from an objective point of view, and the criterion hence show that *B'* dominates *A* but not that *B* dominates *A*.

The validation of the Kaldor-Hicks criterion for a reform proposal from *A* to *B* means that the utility value of the compensation for the looser (receiving the compensation) is larger than the utility of her loss due to the reform, and that the utility value of the compensation for the winner (paying the compensation) is lower than the utility of her gain due to the reform. Nevertheless, it does not imply that the utility of the gain for the winner is larger than the utility of the loss for the looser since the utility value of the compensation is different for the winner and the looser. Indeed, the utility value of the compensation derives from the marginal utility of income in the same way as the marginal willingness to pay presented above, and "*a pound's worth of satisfaction to an ordinary poor man is a much greater thing than a pound's worth of satisfaction to an ordinary rich man.*"[13]

Let us take an example to clarify this. Assume a village of poor workers, whose surroundings are a wood where the inhabitants enjoy their free time. A club of wealthy golfers argues about their right to build a new golf facility in replacement to the wood. Authorizing the construction would increase the utility of the golfers (by providing an additional course for their loved sport) and decrease the utility of the villagers (by destroying the place where they spend their leisure time). Assume also that the pleasure of the villagers when enjoying the wood is larger than the pleasure of golfers, because the wood is the only villagers' source of leisure whereas the new golf facility would only provide a diversity utility compared to the other golf courses they have access to. Consequently, the transformation is not efficient. Nevertheless, assume that due to very unequal budget constraints, the willingness to pay by the villagers to keep their leisure in the wood is much lower than the willingness to pay by the wealthy golfers for diversifying their golf practice. Hence, a set of transfers from golfers to villagers may exists, which makes unanimity about the transformation of destination of the piece of land: the Kaldor-Hicks criterion is verified. However, it is really doubtful that "*it is quite sufficient for him* [the economist] *to show that even if all those who suffer as a result are fully compensated for their loss, the rest of the community will still be better off than before*."[14]

[13] Marshall (1890), pp. 106-108.
[14] Kaldor (1939).

Cost-benefit analysis

Nowadays, a broad family of methods called *cost-benefit analysis* (CBA) has become the standard of evaluation of the welfare effect of potential private project or public policies, as stated by the Director of the OECD Environment Directorate, Lorents G. Lorentsen, in his foreword to the OECD manual over cost-benefit analysis (Pearce et al., 2006): "*Cost-benefit analysis is now recognised as an indispensable tool for policy design and decision making. (...) A number of countries and the European Commission have introduced legal provisions requiring impact and cost-benefit assessments of major policies and regulations.*"

The main problem of this method is to compute all the costs and all the benefits in a comparable unit, although they differ qualitatively and temporally. The temporal correction is done by the technique of actualization, which consists in discounting future costs and benefits exponentially with respect to the temporal distance: a cost c in t years would be valued today $c.(1\text{-}\delta)^t$ where δ is the discount rate. The qualitative correction is done by evaluating all costs and benefits in monetary terms, thanks to a large set of different methods, almost all based on the notion of willingness to pay, as stated in the OECD manual intended to policy-makers (Pearce *et al.*, 2006):

> *The essential theoretical foundations of CBA are: benefits are defined as increases in human wellbeing (utility) and costs are defined as reductions in human wellbeing. For a project or policy to qualify on cost-benefit grounds, its social benefits must exceed its social costs. "Society" is simply the sum of individuals. The geographical boundary for CBA is usually the nation but can readily be extended to wider limits. There are two basic aggregation rules. First, aggregating benefits across different social groups or nations involves summing willingness to pay for benefits, or willingness to accept compensation for losses (WTP, WTA respectively), regardless of the circumstances of the beneficiaries or losers. A second aggregation rule requires that higher weights be given to benefits and costs accruing to disadvantaged or low-income groups.*

In practice, a large range of methods exists to assess the willingness to pay. The revealed preference family of methods encompasses direct observation of demand when a market for the studied good or service exists; or hedonic regression approach for characteristics that are not directly sold on markets, but that affects the qualities of other goods or services. Statistical analysis of the varieties of goods' qualities allows to measure the impact of a given characteristic on the willingness to pay. Such hedonic method is for example used to estimate the willingness to pay for amenities linked to housing (such as access to a nice countryside or sea views for positive amenities or atmospheric or noise pollution for negative externalities). Other methods observe the costs the consumers are disposed to bear: travel cost to benefit from water quality (Leggett & Bockstael, 2000) or a recreation area (Day, 2002); willingness to pay for double-glazing to mitigate the welfare impact of noise (Garrod & Willis, 1999); additional time spends indoor to avoid pollution (Freeman, 2003); willingness to pay to buy a cure against a disease to fix the negative welfare impact of that disease (Hirth *et al.*, 2000).

Another large family consists in asking individuals to declare their preference. Contingent valuation proposes a questionnaire or builds a scenario of potential markets and asks for maximum willingness to pay through questions such as "*What is the maximum amount that you would be prepared to pay every year, through a tax surcharge, to improve the landscape*

around Stonehenge in the ways I have just described?"[15] or through a selected number of potential actions: wouldn't do anything, sign a petition, independently write to my local council, donate several potential amounts to a group coordinating protests (Atkinson, *et al.* 2004). In the choice modelling method, a succession of decisions about fictional alternative purchases or behaviors allows to infer the willingness to pay from a rational decision model rather than directly ask for it.

Whatever the weaknesses or strengths of the different methods to actually assess the willingness to pay of a population, the main issue is that all these methods consider that the willingness to pay actually revealed the utility, which is far from true as explained above. There may be some corrections for the budget constraint, such as some arbitrary weighting of the willingness to pay depending on the income, but it keeps quite arbitrary and mainly cosmetic compared to the real distributive issues.

The actualization issue

The other main problem is the actualization. Such computations impact substantially the results of cost-benefit analyses but are founded on fragile theoretical bases. A discount method can be found in the very first cost-benefit analysis in the middle of the XIXth century: in this case, Jules Dupuit (1844) does not discount future profits to a present value but the initial cost of building a public infrastructure (Jules Dupuit was a civil engineer) was deferred to all future dates via the rate of interest. In present CBA, all future costs or benefits are discounted to the date of the decision making, but the principle is quite similar.

In his course at the *Collège de France* and in the book accompanying it, Christian Gollier[16] (2022) presents the main defense of the use of a 4% actualization as it is the average return to capital over the past century. The idea is that an action today to diminish the impact of the global warming is costly. The opportunity cost in the future of this action is the long-term return of this amount of money if it were invested in productive capital. Hence, the action is not considered worth the cost if its benefits in the future are not superior to those of the hypothetical capital (the initial capital plus the yearly interest on this capital and all the previous benefits supposed reinvested in productive capital). He believes such strongly in the capacity of markets to reveal the true values (here the value of time) that he asks for the creation by the public sector of a private market for very long-term debt in order get informed of the true value of time for people (which illustrates perfectly the principle of neoliberalism of aim of public intervention being to create private markets):

> *In order to determine a valid discount rate for climate change, it would be useful to know what the average rate of return would be at eighty years or more. The problem is that there are very few risk-free bonds with such high maturities. (...) I have been arguing for some time that the French Treasury should issue sovereign bonds with maturities of a century or two (...). This would provide a price*

[15] Pearce et al., 2006.

[16] Christian Gollier is one of the most active academic militants for the carbon tax and a specialist of the CBA methodology. He is institutionally recognized as the main French economic expert on climate change, and was proposed for that motive a chair on the issue at the *Collège de France*; he is also the author of the chapter on climate change of the large report on the "Major future economic challenges" commanded in 2021 by the French Republic President Emmanuel Macron to an international commission presided chaired by Olivier Blanchard and Jean Tirole (Blanchard & Tirole, 2021).

> *signal on how savers and the market value risk-free benefits for future generations.*[17]

Such a view derives directly from the CBA principle to value collective welfare from individual welfare. Actually, it is observed that individuals tend to value future costs and benefits less than present costs and benefits. But where does this individual preference for the present come from? This comes initially from the economic interpretation of an empirical observation: when two people exchange consumption over time, it is the one who brings her future consumption back to the present (by borrowing) who pays (through the rate of interest) those who agrees to postpone her consumption from the present to the future (by lending). The borrower's acceptance to pay to bring her consumption from the future to the present would be a sign that she values her present consumption more; the lender's asking to be paid to postpone her consumption in the future is the sign that she also values her present consumption more.

However, the interpretation of this consumption time-transfer price is far from being so obvious and multiple reasons other than a supposed preference for the present can explain it. A family of explanations is linked to irrational behaviors, even if by definition they are outside the neoclassical ideal-type studied here. Nevertheless, even one of the founders of Welfare Economics, Charles Cecile Pigou, considers time preference as irrationality:

> *Generally speaking, everybody prefers present pleasures or satisfactions of given magnitude to future pleasures or satisfactions of equal magnitude, even when the latter are perfectly certain to occur. But this preference for present pleasures does not – the idea is self-contradictory – imply that a present pleasure of given magnitude is any greater than a future pleasure of the same magnitude. It implies only that our telescopic faculty is defective, and those we, therefore, see future pleasures, as it were, on a diminished scale. This reveals a far-reaching economic disharmony. For it implies that people distribute their resources between the present, the near future, and the remote future on the basis of a wholly irrational preference.*[18]

If individuals suffer from time myopia, they clearly feel the present costs and benefits but could only imagine (by diminishing them) the future costs and benefits. They would be cicadas more than ants. Such an explanation of individual behavior does not justify taking account of a collective time-preference in CBAs. The myopia effect is strictly speaking an irrational effect although the cost-benefit analysis seeks to rationally determine the comparison of costs and benefits at the collective level.

Nevertheless, time-preference behavior can also be rational. First, when an individual compares a present cost with a future benefit, she must bear in mind that she will not enjoy the future benefit if she is dead or if unforeseeable circumstances nullify the future effect of the present effort. In this context, the individual time-preference would in fact only reflect the probability of the existence of the conditions for future benefits. A second explanation can be linked to the capacities to actually enjoy a surplus of income in relation to the life cycle: perhaps welfare in young ages is more related to material consumption while the pleasures of

[17] Gollier (2022), p. 307.
[18] Pigou (1920), pp.24-25.

the wises are related to intellectual consumption. If this assertion were true – which is uncertain – then at equal wealth, the marginal utility of income would be higher in young ages than in old ages, justifying a time-preference at the individual level. However, neither the probabilistic explanation nor the life-cycle explanation justifies discounting future costs and benefits at the collective level because these two explanations rely heavily on the comparison of benefits for the same individual at two different periods of her life although intertemporal CBA compares benefits by different individuals at the same period of their lives.

Another interpretation is possible within the neoclassical ideal-type without any time-preference. Indeed, in the intertemporal model, we can see the interest rate as the equilibrium price between supply and demand of loanable funds. On the one hand, companies needing to invest and households at the start of their life seek to transfer purchasing power from their future to their present: this is the demand for loanable funds. Opposite, other households (wealthy people or those saving for their old age) seek to transfer their current purchasing power to the future: this is part of the supply of loanable funds (the other part being made up of monetary creation). In the past, and whatever the underlying reasons (strong investment needs on the one hand, relatively scarce and very concentrated stock of capital, not very expansive monetary policy, etc.) the supply of loanable funds was rarer than the demand for loanable funds, hence the positive interest rate. This explanation fits well with the fact that since investment (public and corporate) has fallen, the value of capital stock (as a proportion of annual national income) has risen sharply (Piketty & Zucman 2014) which leads German and French States to borrow at negative rates: those who want to transfer their purchasing power in the future paid these states to keep their money.[19] This explanation of interest rates by a market equilibrium without individual time-preference fits the neoclassical ideal-type but does not make it possible to transfer the principle of discounting from the individual to the collective level. To which loanable welfare market would we refer in comparing the (non-discounted) welfare of present generations and the (discounted) welfare of future generations? In this context, discounting would be more a sign of the selfishness of present generations *vis-à-vis* future generations than a real collective time-preference.

<u>The intergenerational equity motive for actualization</u>

Another interpretation of the discount rate is related to the intergenerational equity motive. The principle rests on an argument mentioned above concerning comparisons between periods of the life cycle: individuals generally become richer as they grow older; thus, the marginal utility of income is lower in old age than in young age (because of the income effect), inducing a desire to transfer future income (when one will be better off) to the present (when one faces a strong budget constraint). For this interpretation, the shift to the collectivity is easily done through the principle of economic growth: by comparing a cost today and a benefit in the future (or conversely a benefit today generating a cost in the future), one compares not only different costs and benefits but also costs and benefits borne by differently wealthy populations. This is what makes Christian Gollier say:

> *Investing for the future or fighting against global warming ask us, the relatively poor, to sacrifice a part of our purchasing power to improve the purchasing power of future generations who will be much richer than we are (...) Asking today's*

[19] Before the health crisis, when the inflation rate was low, even the nominal interest rates were negative. Nowadays with larger inflation, the nominal interest rates are positives but the real interest rates remain negative.

> *generations to make sacrifices for future generations is a bit like asking the most disadvantaged among us to contribute to make a gift to Bill Gates!*[20]

Under this conception, the discount rate is not a rate of return on capital but a coefficient of aversion to inequality. If one is more averse to inequality, then she will compensate more for intergenerational differences in income, and will consider the fate of future generations less. The paradox is that according to this conception, we will value the fate of future generations all the more if we do not try to minimize inequalities. This is how the controversy between Stern and Nordhaus about the valuation of a ton of carbon emitted arose. In the Stern Review (Stern, 2007), the former defended a price per ton that was much higher than what the latter (and the majority of economists) proposed. It turned out that the discrepancy stemmed from their assumption of inequality aversion, with Stern considering a lower aversion to inequality than economists usually do.

After Nordhaus (2008) critique, there has been a great deal of debate in the economics community about the right level of discounting the future. It is important here to recall that, for the same model and all other assumptions being equal, the choice of the discount coefficient can change the results completely. Thus, the model used by Christian Gollier (2022) to define the optimal price of carbon finds a tax at €50 per ton with the discount rate used by public institutions in France (4%), it would only be €5 per ton with the discount rate used by American public institutions (7%) but it would rise to €500 per ton with a rate of 1%. We can thus see that public decisions, officially based on the rationality of complex cost-benefit analysis models, may in reality depend only on the choice of a parameter that relates to psychological and ethical values. One might even fear that the sophistication of the mathematical model might hide the reality of the basis of the result, which is in fact a subjective value.

This is all the more problematic since the very existence of this parameter is questionable. First, CBAs are concerned with the costs or benefits in terms of growth, and so the growth assumptions should be endogenous to the models: adding a discounting parameter may lead to double counting the effect of growth. Second, the growth outlook is very unclear. There is a great debate as to whether the current period of relatively low growth over the last fifty years will continue or even strengthen when developing countries catch up with industrialized countries, or whether on the contrary a new growth cycle will resume (see in particular the debate initiated by Gordon (2016) who defends the thesis of a future secular stagnation).

But the main problem comes from the shift from differences between individuals during a common period to differences between generations between periods: we measure a supposed aversion to societal inequality concerning the second type of differences from aversions to individual inequality concerning the first type. But, again, even if this seems logical at first sight, further reflection shows that it is far from obvious. The main issue is that the question of intergenerational equity is based on a comparison of the well-being of the generations and not of their income. Now, if in a common society during a common period, having more purchasing power does indeed lead to higher well-being, the question is much more complex between generations.

First, staying with the example of climate change, the notion of substitutability between natural and artificial capital is central. The principles of sustainable development assume such

[20] Gollier (2022), pp. 315-316.

substitutability: our generations destroy natural capital but replace it with artificial capital (material or linked to innovations) that will allow future generations to consume more. Future generations will indeed have a higher global well-being than ours if this artificial capital compensates for the losses in natural capital. From this point of view, we can already see that our growth accounting does not allow us to answer the question because it measures gross production and not production net of the destruction of natural capital. If the latter were taken into account, growth – even in the past – would certainly be measured much lower. To overstate the case, one might ask whether we should actually consider the fate of future generations less because they will have greater material wealth than we do, which will allow them to afford artificial respirators to compensate for the lack of clean air, air-conditioning to avoid unbearable temperatures, infrastructure to counteract increasing storms, or medical care to treat emerging diseases? All this creates economic growth. It also generates a lot of welfare from an intragenerational point of view: those who can't afford to buy these things will have much less welfare than the others. But from an intergenerational point of view, destroying natural capital and producing artificial capital to mitigate its impacts does not necessarily create an overall improvement in well-being.

Another issue exists even outside of environmental accounting problems: the fruits of growth, in monetary terms and even more so in terms of welfare, are not evenly distributed. From a monetary point of view, the data accumulated by the World Inequality Database (Chancel *et al.*, 2022) shows that in the majority of industrialized countries, the fruits of growth over the last four decades have been very unevenly distributed, with the least well-off half of the population seeing their income increase much less than the average; in many countries it is even the 90% out of the most well-off 10% who have seen their income grow much less than the average growth per capita. In this context, discounting future costs or benefits at the average growth rate amounts to a significant undervaluation of the fate of the majority – except for the most privileged – of future generations. This is all the more true if we are interested in the effective utility created by this growth. Indeed, a major recurrent debate in the measurement of growth concerns the taking into account of quality, and thus of the quality-price ratio of production. In practice, output is calculated in volume in current money, and then growth is calculated by subtracting the part due to the rise in prices as a result of the depreciation of the currency: inflation. Thus, it is necessary to separate statistically the part of the price increase linked to the increase in the quality of production – which constitutes growth – from that which is pure inflation. To do so, the statistical institutes chain their indices: within a given product category, the difference in prices from one year to the next of pre-existing products is used to measure inflation, and the difference in prices at a given period between new and pre-existing products is used to measure the increase in quality.

Aghion *et al.* (2019) challenge this measure and argue that it overestimates inflation and thus underestimates growth. The argument is based on the principles of Schumpeterian growth via creative destruction through innovation. If new products have a higher price-quality ratio than old products, the price difference underestimates quality. They propose to make the correction thanks to empirical measures of market shares and a theoretical model that determinates the relation between market shares and price-quality ratios. They deduce that growth is indeed slightly underestimated, especially in hotels and restaurants but not in the manufacturing sector. However, the argument can be turned on its head if one considers that one of the ways in

which market shares are gained is through fashion effects, or at least through a preference for novelty. In this framework, we can assume that the price difference between new and old products does not reflect a difference in perennial quality but a temporary quality – the fact of being new – that cannot be added to each new product because it fades during its life cycle. Thus, variety 2 replaces variety 1 by surpassing it in novelty, but this characteristic disappears and thus, before being replaced by variety 3, the variety 2 has lost this quality of being new, so that if we add the difference in price between varieties 3 and 2 to that between varieties 2 and 1, we count the same quality twice, that of novelty. This bias would lead public statistics to overestimate growth.

Finally, and even if growth in quality were correctly measured, one could question the impact of quality in terms of well-being, all the more so in a framework of strong intragenerational inequalities. This finally joins a classic problem in industrial economics, in particular since the simplified model of Dixit & Stiglitz (1977) integrating the preference for diversity, namely the trade-off between quantity and diversity of consumption. The idea here may be that innovation in quality is not valued in the same way according to income constraints. Indeed, the evolution of quality modifies social norms and therefore needs. For example, the development of mobile telephony is undoubtedly an increase in the quality of communication capacities, but it is also becoming a constraint that occupies an increasing share of budgets: it is now necessary to be connected to be part of the society. In the same way, the increase of the internet flows induces an adaptation in the size of the contents. Thus, it is not denied that the increase of the flows constitutes an actual increase of quality, whose price increase reflects the growth in quality and not inflation; nevertheless, the individuals cannot access of the contents anymore if they do not pass to the innovation, even if they do not value it as such.

3.2. Public intervention for benefiting from the markets' efficiency

Whatever the way the public intervention are evaluated in terms of costs and benefits in terms of population welfare, it is noticeable that public intervention in the economy measured by the share of public budgets in proportion to the GDP has grown considerably during the second half of the XXth century. As discussed above, this high level of public budget in proportion to GDP should not be considered as the proof that the influence of the neoclassical ideal-type has vanished. Public policies are very substantial in financial term but their purpose is increasingly to amend the economic situation in order to benefit even more from the assumed efficiency of markets. In this last section are presented some of the main policies of past decades by explaining how they target the different dimensions of market efficiency.

<u>Minimal intervention: equality of opportunity</u>

Closely based on the two welfare theorems, the first family of public interventions consists mainly in modifying the "initial conditions" of the market process to select a less unfair Pareto optimum (following the second welfare theorem) then letting the markets drive the economy to an optimal situation (following the first welfare theorem). The most known public policy of this kind is the basic income in its purely liberal version presented by Friedman (1962). Before and after this presentation, a large literature has discussed different versions of this policy, with some much less pro-market ideology. Among the essential differences are the level of the basic income: only changing the targeted Pareto optimum if low but potentially

changing more importantly the labor market negotiations if higher, even if, to my knowledge, nothing close to such distortive basic income has ever been set.

The second main difference is the implementation of basic income in addition or in substitution to other social interventions. In the purely liberal version, the basic income should substitute the other social policies. Actual implementations are mainly partial implementations, through the coordination of several taxes and transfers to set a coherent schedule close to the idea of a negative income tax. It was part of the philosophy of the EITC in the US and the WITC in the UK, targeting specifically the lone mothers (hence not universal). In France, it was the aim of the transformation of the basic allocation – *RMI* – in *RSA socle* plus *RSA chapeau* (complementing potential wages), and now in *RSA* plus an activity allocation (*prime d'activité*, PA). The official principle is a negative income tax complementing other social policy but the reality of a partial substitution is possible. For example, PA growth is concomitant to the relative decrease (compared to productivity) of the minimum wage. More transparently, as a response to the yellow vest social contestation, French President declares during a TV diffusion on December 10th 2018 that "*the wage of a minimum wage worker will increase of 100 €*"[21] but the actual reform was to increase the PA and not the minimum wage, with important consequences in terms of social protection: this share of wage is not insured by social security (retirement, unemployment, paid sick days…) which had a strong impact during the Covid-19 crisis.

Basic transfers are also proposed for wealth in addition to income (Paine, 1797; Le Grand & Nissan, 2000; Atkinson, 2015; Piketty 2020). In the presentation of such proposition, the main use of the endowment, which is often given at 18 years old, is to help young adults to finance their higher education. As for the basic income, the substitution of a public system toward a market – with initial subsidy – is at stake: it may be a way to help developing the market for private higher education in countries where public system still predominates. More broadly, this example recalls the discourse of equality of opportunity, which fits the neoclassic ideal-type. The initial redistribution according to the second welfare theorem would be the endowment (spend in education), then each individual would be armed to compete in the wide market system. Under this scheme, even large *ex-post* inequalities may be considered fair according to a theory of meritocracy, as in the dystopian novel of Michael Young Dunlop (1958).

Faith in the allocative efficiency of the markets

The previous subsection presents some policies aiming at correcting inequalities without modifying the process of market coordination of all human activities. The following subsections focus on each of the three dimensions of market efficiency. First, present subsection focuses on the allocation efficiency. One example of such policies is the tax incentive for private philanthropy. Actually, as presented by Peter & Huber (2021) for introducing several chapters on

[21] https://www.elysee.fr/emmanuel-macron/2018/12/10/adresse-du-president-de-la-republique-du-lundi-10-decembre-2018.

the justifications of public subsidy to philanthropy: "*in essence, tax incentives for private philanthropy amount to channeling public funds into support for private activities that have been decided and structured by bypassing democratic governance mechanisms.*"

In addition, the Pigouvian taxes or transfers following the information theory may be considered has a broad set of similar transfers aiming to subsidize a sector while letting the markets decide of the allocation of the funds. The most debated presently – given the emergency and importance of global warming – is the case of green taxes. Such an example is archetypal in the sense that it is actually based on the faith in the three dimensions of market efficiency: hence, green taxes are discussed here and in the two following subsections. Concerning allocation efficiency, the idea is that it would be optimal not to decrease the production of the most polluting goods or services but those with the lowest ratio of utility over pollution. Yet, the carbon tax corrects the prices in order to internalize the pollution impact in the price of goods, hence leading the *MRT* – the marginal rate of transformation of investors between the potential investments in two different productions – to reflect the adequate ratio of utility generated by the two potential productions, that is the green tax corrected *MRS* equal for all consumers. Yet, as explained above, this equilibrium *MRS* is not unanimous preference of the population but the average preference weighted by the purchasing power. Hence, even if markets were perfect, the aftermath of the green tax would select the production of goods and services with the best ratio of utility for rich consumers over pollution.

A large set of other examples is based on the same principle, with the same consequences. As documented by the OECD (2021), the public support to research and development has greatly increased in past decades: among these policies, the share of tax incentive has grown. While acting that market failures lead to underinvestment in research and development, such incentive public policies aim at financing private R&D without interfering in the project choices, letting the markets allocate these public funds. It is also notable that the majority of public funds for employment in France is spend through wage subsidies, mainly social contribution rebate (Carbonnier *et al.*, 2016; Carbonnier *et al.*, 2022; Carbonnier & Palier, 2022). Here again, public expenditure is large but let the markets decide of the allocation of this partially publicly funded workforce.

<u>Faith in the productive efficiency of the markets</u>

As presented above, green taxes seek to benefit from the three types of efficiencies. The productive efficiency objective is motivated by the heterogenous technology the different firms have access to for reducing their emissions. They also benefit from different intrinsic productivity. Hence, setting a carbon price and letting the firms choose their level of (costly) emissions permits the productive efficiency in the sense that those for which depollution is too costly go on polluting, compensated by those for whose depolluting is easy which can depollute more than expected.

In addition to the emblematic green taxes, the example of the faith in the productive efficiency of markets may also be seen in the *New Public Management* whose aim is to improve public management efficiency through the introduction of private management principles (Gruening, 2001). Among the different ways of introducing these management principles, the most direct

ones are public-private partnership or contracting. The French case of contracting with private firms for counseling job seekers has been assessed through a large-scaled randomized controlled experiment by Behaghel, *et al.* (2014). They found that the effect per beneficiary is half under the private program compared to the public one. One explanation is that the for-profit firms select their efforts provided to the different job-seekers in order to maximize the ratio of payment (based on contracting criteria) over effort.

Such negative impact of pay for performance models may also be seen in the case of public hospital subject to activity-based costing: selection of patients depending on the financial rentability for the public hospital department (Juven, 2018) or even refusal to provide some costly treatments (but vital ones, such as dialysis) to certain patient for cost motive (Foubert, 2021). In the public research sector, the trend toward financing through project may be view as the construction of a fictive market for public research. In that case, instead of founding labs and allocating research budgets for Professors, the choice is made to mimic a demand side of a research market through agencies and juries purchasing research projects from research teams constituted as firms.

Faith in the distributive efficiency of markets

In addition to other efficiency dimensions, green taxes aim at benefiting from the distributive efficiency of markets as presented in section 3.1. The efficiency relies in the distribution of a limited amount of emissions between rivalrous consumptions: only the consumptions with the highest ratio of marginal utility over marginal emission should be addressed. As previously explained, the distributive efficiency of markets is based on the idea that the marginal willingness to pay informs on the marginal utility, which can be defended from an intra-household point of view but not from an inter-household point of view. Yet, the principle of green taxes is to distribute the caped level of emissions for the whole society, even the whole planet: it is hence clearly an inter-household issue. Some proposals are to compensate the inequality increase generated by this policy. Nevertheless, such a redistribution is very partial, and hardly differentiable from general redistribution policies in the long run. Hence, even if it compensates the inequality impact, it does not change the bias toward large purchasing powers in the selection of consumptions and constitutes rather a "minimal intervention" as presented in the first subsection of this section 4.2.

Faith in distributive efficiency of market may also be found in the "free choice" policies, as set in a growing number of social policies in the OECD (Garritzmann *et al.*, 2022a, 2022b). Systems of vouchers for consuming privately public services such as school is an example. In addition to the hope that the pressure of competition from parents will have an impact in term of productive efficiency, the choice by the parents of the most appropriate pedagogy may be considered as a distributive efficiency. Yet, the efficiency is not actual if informational bias or non-take up occur (imperfect competition) or if supply constraints generate a sorting of kids to schools based on affordability in addition to preferences. Consequently, such policies, even if sometimes labelled as social investment, may have substantial inequality impact: they are part of the stratified version of social investment (Garritzmann *et al.*, 2022a, 2022b; Carbonnier & Palier, 2022). Other examples of stratified social investment linked to "free choice" may be found in different sectors such as early childcare (Carbonnier & Morel, 2015, 2018) or retirement saving (Carbonnier *et al.*, 2014).

Another important sector of regulation by consumption incentive is the use of price signal through copayment in social insurances in order to mitigate the impact of a potential moral hazard. Actually, such schemes are an alternative to other methods linked to direct control, which is often possible (even without too heavy interference in private life) in social insurance policies. For an example in the case of health insurance, the general practitioner – if not placed in a market competition situation – may be an adequate controller of the treatments really needed. At the opposite, copayments may lead to important healthcare forgoing (Féral-Piers-sens *et al.*, 2020). The general practitioner is also an adequate controller in the case of paid sick days. Consequently, Pollak (2017) found no impact of the inclusion of a delay of three days before paid sick leave in France, probably because the control is sufficient and the French problem is more linked to presenteeism than absenteeism: presenteeism may have a strong adverse impact on public health, as shown by the Covid-19 pandemic (Pollack *et al.*, 2022).

Conclusion

This paper analyzes the notion of efficiency of market in the neoclassic ideal-type of perfect competition general equilibrium. It shows that this notion is divided in three dimensions – namely allocative, productive and distributive efficiencies – and that each depends heavily on the notion of willingness to pay. The interpretation that perfect competition is efficient rely on the interpretation of willingness to pay as a proxy for individual welfare, which is a very biased interpretation, even within the neoclassic framework. Consequently, market competi-tion – even in its ideal-type version – is not proved to be efficient from a political and social point of view. It is only efficient in terms of trade value, but stating that market competition is good for trade is a bit tautologic. The coordination of individual behaviors through a pure market system actually corresponds to coordinating individual preferences through a decision system weighting the preferences of the individuals by their purchasing power. Nevertheless, an increasing share of public policies rely on the faith on this market efficiency: it seeks to replace constraining regulation by a large range of regulation through market processes.

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