Normative Economics

5

This chapter covers . . .

- what consequentialist and deontological theories of justice are and how they relate to virtue ethics.
- how mainstream economics is based on a consequentialists' ideas of justice.
- the concept of Pareto efficiency and why competitive markets are efficient.
- how there could be tensions between efficiency and distributional objectives.
- how individuals can fail to do what is good for them.

5.1 Introduction

> 'It is demonstrable,' said he, 'that things cannot be otherwise than as they are; for as all things have been created for some end, they must necessarily be created for the best end. [. . .] [A]nd they, who assert that everything is right, do not express themselves correctly; they should say that everything is best.'
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> 'If this is the best of possible worlds, what then are the others?' (Voltaire, Candide)

> If one is a utilitarian in philosophy, one has the perfect right to be a utilitarian in one's economics. But if one is not [. . .] one also has the right to an economics free from utilitarian assumptions. (John Hicks)

The analysis of the coffee market in the last chapter showed how the model of perfect competition can be used to better understand economic phenomena. This has been an exercise in what economists call positive economics, which is a very important aspect of economics, as a social science. However, most people are not only interested in the logic of social interaction, but also in normative questions about desirable properties of institutions like markets. Economists, like other social scientists, are not experts in justifying specific, normative criteria, but what they can do is to analyze if or to what extent certain institutions make one's ideas about justice and fairness a reality. There is a division of labor between economists, practical philosophers and the general public in the discourse about the "right" way to

M. Kolmar, *Principles of Microeconomics*, Springer Texts in Business and Economics,
DOI 10.1007/978-3-319-57589-6_5

organize society. The general public has certain (culturally influenced) viewpoints and gut feelings about justice that are scrutinized and systematically analyzed by practical philosophers, and some of these theories are put to the test by economists, who try to figure out how institutions have to be designed to help promote the normative goals of the individual members of society. Under ideal circumstances, this process can lead to a fruitful discourse between philosophers, economists and the general public, because the coherence of one's ethical gut feelings with the implied institutional consequences can thereby become visible and may lead to a process of adjustments in one's ethical views as well as one's ideas of just institutions. John Rawls (1971), a philosopher, called such a state of balance among ethical intuitions and institutions, which is reached through a process of deliberative mutual adjustment among general principles and particular judgments, a *reflective equilibrium*.

✍ The outlined picture of the division of labor is, maybe, a little bit too optimistic, in the sense that mainstream economics is overwhelmingly concerned with a specific class of normative theories, which are called *welfarism*. Welfaristic theories of just institutions start from the normative premise that individual welfare, and only individual welfare, should matter for an evaluation of institutions. Individual welfare is measured in terms of the (subjective) wellbeing (often called *utility*) the individuals experience (or are supposed to experience) in a specific institutional context. Welfarism is a subclass of a larger class of normative theories that is called *consequentialism*. All consequentialist theories of justice share the view that the consequences of acts are all that matters for normative evaluations. This property has far-reaching implications for the way one perceives the role of institutions: they are basically incentive mechanisms that have to guarantee that individual behavior leads to the socially most desired outcomes. Institutions are like irrigation systems: the flow of water follows the laws of gravity so, to make sure that a garden flourishes, one has to dig the channels in the right way. The same is true for society: individuals follow their interests so, to make sure that individual and social interests are aligned, one has to make sure that individual interests are "channeled" in the right way, by means of adequately designed institutions.

✍ In looking at the big picture, consequentialism itself is only one of three major classes of normative theories that are debated in practical philosophy, the other two being *deontology* and *virtue ethics*. Deontological theories assert that consequences are irrelevant for the normative evaluation of acts, but rather the focus belongs on certain properties of the procedure, which lead to decisions. A prominent representative of this way of thinking is Immanuel Kant, who famously claimed that good will is the only analysis that counts for the normative evaluation of acts, though there are many more. This view puts much more emphasis on individual moral responsibility and less on institutions. It states that the primary entity that makes sure that individuals behave morally is the law of reason, not the law of the state. The role of formal institutions is, therefore, secondary.

Another classical proponent for a completely different deontological concept of justice is John Locke, who argued that humans have absolute natural rights. Rights are not assigned because they serve a higher purpose (they are means), but because they are an integral part of what it means to be human (they are ends). According to

this view, natural rights are not contingent upon the laws, customs, or beliefs of any particular culture or government, and therefore are universal and inalienable. They are life, liberty, and property. However, if property is a natural right of every human being, then markets get a direct, normative underpinning, because liberty, private property and markets go hand in hand. Disciples of the natural-rights tradition do not support markets because they have desirable consequences, but because they respect property and liberty.

Virtue ethics goes all the way back to at least Aristotle and is a theory that sees the main challenge a human being faces in the quest to perfect his or her virtues. Very similar ideas can be found, in for example, Confucianism and Buddhism. The virtuous moral person, like the virtuosic violin player, acts morally effortlessly, because she trained herself to make it her "second nature." The virtuous person does not act morally in the sense of Kant, because she does not act out of a sense of duty. If a person performs an act, it is because she is inclined to act this way, due to it it "feeling natural" to the virtuous person, Kant calls this act *beautiful*, not moral.

The virtuous person acts in accordance with his or her moral duties, which again changes the view one has on the role of institutions. Contrary to Kant, who puts a lot of trust in the ability of reason to control individuals, institutions play an important role in virtue ethics, because good institutions help individuals to become (morally) virtuous. The good state, according to this view, is the state that helps its citizens become virtuous: "We become just by the practice of just actions, self-controlled by exercising self-control, and courageous by performing acts of courage. [...] Lawgivers make the citizens good by inculcating [good] habits in them, and this is the aim of every lawgiver; if he does not succeed in doing that, his legislation is a failure. It is in this that a good constitution differs from a bad one." (Aristotle, Ethics 1103a30)

There is also a decisive difference between virtue ethics and consequentialism regarding the role of institutions, which can be traced back to Machiavelli. He wrote that "anyone who would order the laws [...] must assume that all men are wicked [...] it is said that hunger and poverty make them industrious, laws make them good." (Machiavelli 1984, 69–70). The task of government for Machiavelli, was not to make citizens moral, but to make them act *as if* they were (Adam Smith's invisible hand that leverages self-interest onto social welfare lurks in the door). Institutions, in this sense, are *incentive mechanisms* and this view made its way via Mandeville and Hobbes into modern consequentialism, with far-reaching consequences for people's ideas about the role of institutions and the balance between individual responsibility, autonomy and the state. A state, whose main purpose is to make selfish people behave as if they were not selfish, is a different state from the one that helps people to develop, for example, the virtue of justice. Both ideas about the role of institutions start from different anthropologies and it is unclear which one describes a human being more adequately.

Mainstream economics has mostly, if not exclusively, focused on welfaristic theories of just institutions and is, in this respect, normative. Insofar as it is not tailored to the specificities of consequentialism, the toolbox could, in principle, be used to analyze the implications of other ethical views, but this is not done in practice.

✍ Economists' self-perception is that they are no experts in normative theories and that they, therefore, focus on what could be seen as a minimum criterion for a just society: the criterion of *Pareto efficiency*. The idea goes back to the Italian economist Vilfredo Pareto. He wanted to understand under which conditions institutions are able to cope with the problem of scarcity in order to avoid waste. Waste, in this sense, is not the peel of a carrot, but a specific property of the allocation of goods, services and resources. An *allocation* is a technical term for the distribution of resources, goods and services among the individuals in a society. The basic idea is that this allocation would be wasteful, if it were possible to redistribute the available goods and resources in a way that makes at least one individual better off without making any other individual worse off. This type of wastefulness will henceforth be called *inefficiency*, and an allocation that avoids waste will be called *efficient*.

The idea of efficiency sounds rather intuitive: an allocation cannot be just in the welfaristic sense, if it is possible to make some people better off without harming others. Therefore, efficiency is, in a sense, a necessary condition for a just allocation of goods and resources. The question as to whether this is sufficient or not will be the topic of later discussion.

In order to make this idea more precise, one can split the production and consumption of goods and services into two classes of activities: production, given resource constraints, and consumption, given constraints on the available goods and services (scarcity).

► **Definition 5.1, Efficiency in production** An allocation of given quantities of resources is efficient in production, if it is not possible to reallocate the resources among the producers in such a way as to increase the production of at least one good without reducing the production of some other good.

► **Definition 5.2, Efficiency in consumption** An allocation of given quantities of goods and services is efficient in consumption, if it is not possible to reallocate the goods and services among the consumers in such a way as to increase the well-being of at least one consumer without reducing the well-being of another consumer.

► **Definition 5.3, Pareto efficiency** An allocation of given quantities of resources, goods and services is Pareto-efficient, if it is efficient in production and consumption.

✍ It is straightforward to extend the above definitions to the concept of a *Pareto improvement*: comparing allocations A and B, if no one is worse off and at least one person is strictly better off in A than in B, then A is said to Pareto-improve B. (Note that two Pareto-efficient allocations can never Pareto-improve each other, but it is not true that a move from an allocation that is not Pareto-efficient to an allocation that is Pareto-efficient is always a Pareto improvement. Assume, for example, that allocation A gives 30 apples to individual i and 30 apples to individual j, allocation B gives 80 apples to individual i and 20 apples to individual j, and allocation C

gives 40 apples to individual i and 40 apples to individual j. The individuals prefer more apples to fewer apples. A is not Pareto efficient, because it is dominated by C, but both, B and C are Pareto efficient. Moving from A to B implies a change from a Pareto inefficient to a Pareto efficient allocation, but it is no Pareto improvement, because j is worse off.)

The concept of Pareto efficiency has some intuitive appeal as a normative principle, but has nevertheless been criticized even by adherents of welfarism. The reason is that Pareto efficiency is "blind" with respect to the distribution of economic rents. Assume that Ann and Bill prefer more money to less money and try to distribute CHF 100 in a Pareto-efficient way. It is straightforward to see that *any* distribution of the money among the two is Pareto-efficient: the only way to make one person better off is by taking money away from the other person, which makes this person worse off. Thus, Pareto-efficient allocations may easily be at odds with one's ethical intuitions about just or fair distributions of goods and services.

On the other hand, it is hard to deny that a plausible normative theory (among the welfaristic ones) would not qualify a Pareto improvement as a general improvement in the well-being of society: if it is possible to improve the lot of at least one person without harming any other, why should one not move in this direction? As long as one is not malevolent, it is hard to justify arguments against Pareto improvements. To summarize, if one considers welfarism to be a convincing class of normative theories, then seeking Pareto improvements is necessary, but may not be sufficient for justice.

5.2 Normative Properties of Competitive Markets

The definition of Pareto efficiency is very general and relies on a concept of individual wellbeing that this textbook has not formally introduced so far. While motivating individual and market demand, Chapter 4 made a vague point that it has something to do with individual preferences that we will formally introduce in Chap. 5. In order to see if one can say anything about the efficiency of equilibria on competitive markets, one has to derive a proximate measure for efficiency. Fortunately, this can be done.

In order to see how to do this, it makes sense to focus on a special example of a market, a market for some good in which the demand of a single customer is typically either zero or one, like refrigerators. The analysis is completely general, though, and extends to all products. Figure 5.1 shows the demand function on the market for fridges.

Each point along the demand function can be associated with a specific individual in society and the individuals are ranked according to their willingness to pay for a fridge. This interpretation allows for a very powerful interpretation of the points along the demand function: they give us the customers' maximum willingness to pay. Look at the individual who is "behind" the first unit of the good. The market-demand function at this point signals a willingness to pay that is equal to CHF 2,000. How does one know? By analyzing the response of this customer to

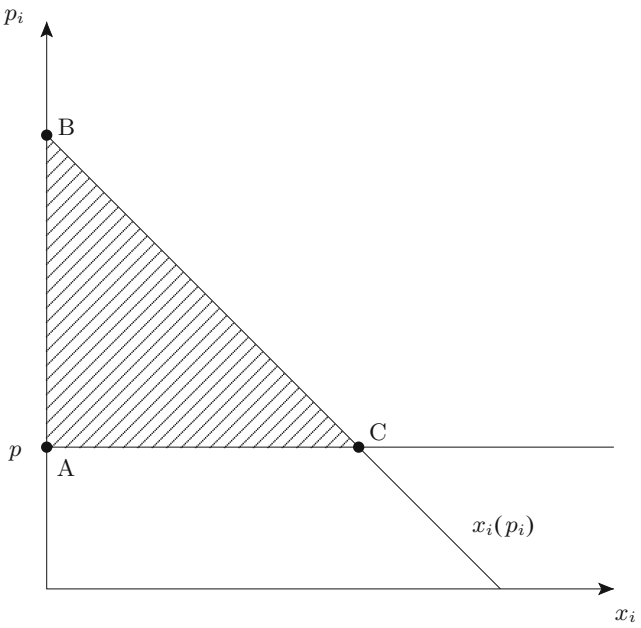

Fig. 5.1 Consumer surplus in the market for refrigerators

different prices. If the market price is below CHF 2,000, the customer is willing to buy, if it is above, she prefers to not buy. Thus, CHF 2,000 is the critical price of the good where the customer is indifferent between buying and not buying, hence it is her willingness to pay.

✍ Assume that the price of the good is equal to CHF 1,200. In that case, the customer will buy one unit of the product. Is it possible to infer anything about the customer's increase in well-being? Under a certain condition that will have to be scrutinized below, yes, because her willingness to pay would have been CHF 2,000 and she pays only CHF 1,200, so a monetary measure for her increase in well-being is CHF 2,000 − CHF 1,200 = CHF 800. The same logic can be applied to all customers, whose willingness to pay exceeds the market price. (All other customers are neither better nor worse off, because they do not buy the good.) Therefore, the aggregate monetary surplus is given by the added differences between one's maximum willingness to pay and one's actual payment. It is equal to the triangular area ABC in Fig. 5.1. This area is called the *consumer surplus*.

In order to define this measure formally, one has to make use of the concept of an *inverse function*. Remember that a function, f, is a mapping from one set A to some other set B that links elements from A with elements from B, so $f : A \to B$. Assume that the mapping is one-to-one such that, for every element a in A there is exactly one element b in B that is connected with the element in A by f, $b = f(a)$ and *vice versa*. The function, f, answers the question as to which elements in B

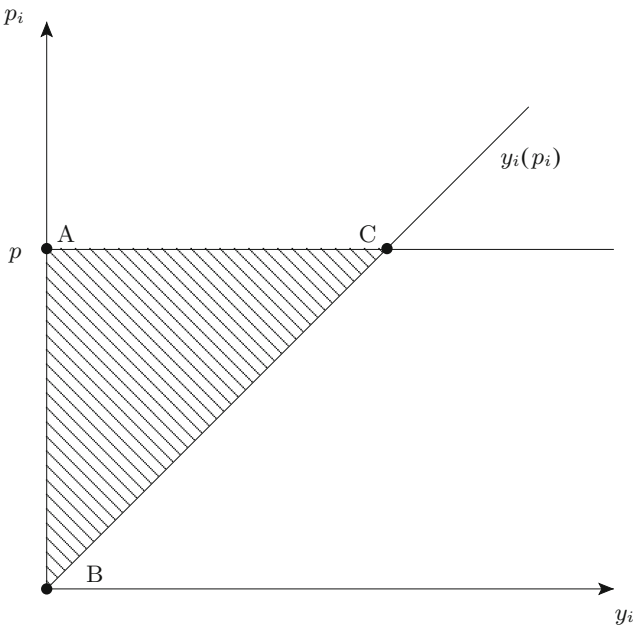

Fig. 5.2 Producer surplus in the market for refrigerators

are associated with the elements in A. One can also ask the opposite question: take an arbitrary element of B; which element of A is associated with it? Given that the mapping is on-to-one, the answer is given by the inverse function that is usually denoted by f^{-1} and which is a mapping from B to A.

► **Definition 5.4, Consumer surplus** Given a market demand function for some good i, $x_i(p_i)$, and a market price p_i, let $P_i(x)$ be the inverse demand function and define as $x(p_i)$ the demand where the price equals the willingness to pay. The consumer surplus is the aggregate difference between the customers' willingness to pay and their actual payment,

$$CS(x(p_i)) = \int_{x=0}^{x(p_i)} (P_i(x) - p_i)dx.$$

One can develop a similar argument for the supply side. Figure 5.2 gives one the supply function for refrigerators.

Assume, for simplicity, that each seller sells either one or no fridge. Then, each point along the supply function can be associated with a specific seller in society and the sellers are ordered according to the minimum price they want to receive in order to be willing to sell the fridge. In order to understand why, look again at the firm that is "behind" the first unit of the good. The market supply function at

this point signals a minimum price that is equal to CHF 100. How does one know? Again, by analyzing the response of this firm to different prices. If the market price is below CHF 100, the firm prefers not to sell the good; if the price exceeds CHF 100, it is willing to sell. CHF 100 is the critical price where the firm is indifferent between selling and keeping the good, hence it is its willingness to sell (which is also sometimes called the reservation price). Formally, this price is equal to a point on the inverse of the supply function. Assume that the price of the good is equal to CHF 1,000. In this case, the firm will sell one unit of the product. This increases its (monetary measure of) well-being by CHF 1,000 − CHF 100 = CHF 900.

✍ Again, the aggregate monetary surplus of all firms that sell at a given market price is given by the added differences between market price and willingness to sell. It is equal to the triangular area ABC in Fig. 5.2. This area is called *producer surplus*.

► **Definition 5.5, Producer surplus** Given a market supply function for some good i, $y_i(p_i)$, and a market price p_i, let $Q_i(y)$ be the inverse supply function and define as $y(p_i)$ the supply where the price equals the willingness to sell. The producer surplus is the aggregate difference between the market price and the firms' willingness to sell,

$$PS(y(p_i)) = \int_{y=0}^{y(p_i)} (p_i - Q_i(y))dy.$$

Combining supply and demand in the same figure, one can now calculate a measure for the aggregate rent on this market, see Fig. 5.3.

What one can see in this figure is the sum of consumer and producer surpluses as the total area between the supply and demand function up to the equilibrium quantity x^*. This sum of consumer and producer surpluses is a measure for the gains from trade that are made possible by this market.

How do the concepts of consumer and producer surplus relate to the concept of Pareto efficiency? If one identifies the willingness to pay and the willingness to sell as expressed on the market with the individual's "true" willingness to pay and sell, then one can identify the allocation that maximizes the sum of consumer and producer surplus with a Pareto-efficient allocation: the only way to make sellers better off is by increasing prices, which makes customers worse off, and *vice versa*. By the same token, selling more than the equilibrium quantity requires both a price below the market price, to induce a buyer to buy, *and* a price above the market price, to induce a seller to sell, which boils down to saying that one would destroy rents. This observation is one of the most profound findings of the theory of competitive markets and, therefore, has a very prominent name.

► **Result 5.1, First Theorem of Welfare Economics** Every equilibrium on competitive markets is Pareto-efficient.

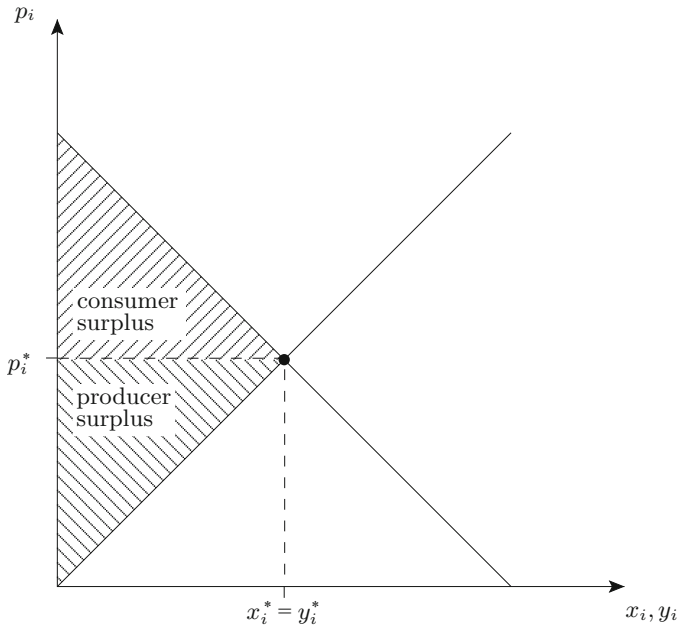

Fig. 5.3 Consumer and producer surplus in the market for refrigerators

The First Theorem of Welfare Economics is a strong result in support of competitive markets, because it implies that markets have a tendency to avoid socially wasteful activities. Under conditions of scarcity, when people would always prefer a larger slice of the cake, competitive markets make sure that the cake is as large as it can be, given the available resources. This is why many economists have a lot of confidence in market economies and competition.

It gets even better. The previous subchapter explained that Pareto efficiency is only a necessary but, for many people, not a sufficient criterion for distributive justice, because the resulting allocation may be highly unequal. Can one say anything about the distribution of welfare? The so-called Second Theorem of Welfare Economics gives a clue.

► **Result 5.2, Second Theorem of Welfare Economics** Assume there are endowments of goods and resources, and that demand and supply fulfill certain conditions of regularity. Then, every Pareto-efficient allocation can be reached as a competitive equilibrium by means of reallocating the endowments.

Again, the statement of this result is not very precise, but it is sufficient for working on the economic reasoning underlying the theorem. Building this reasoning is important, because the theorem became very influential for the way economists think about redistribution. For simplicity, assume that one looks at an economy

without production, where individuals are endowed with certain goods. They can decide to consume their endowments (autarky), or they may enter the market and trade their endowment for some other goods. For example, Ann and Bill are endowed with apples and pears and can try to do better than what they can expect from their endowments, by trading apples for pears with each other. The total endowment of apples and pears is 10 and 10, and both want to consume as many apples as pears. Assume that Ann has all the apples and pears in her endowment and Bill has nothing, so the endowments are $e^A = (10, 10)$ and $e^B = (0, 0)$. In this case, there is nothing to trade and the allocation is Pareto-efficient, but highly unequal. Next, assume that the endowments are $e^A = (2, 8)$ and $e^B = (8, 2)$. In this case, it makes sense to trade and a plausible candidate would be to trade three apples for three pears, allowing Ann and Bill a consumption of five apples and five pears each. This trade would lead to a market price of apples in terms of pears that is equal to 1 (one gets one apple for one pear), and the resulting allocation is the egalitarian one.

Now, assume that one is a social planner or politician, who is leaning towards egalitarian outcomes, and one is confronted with initial endowments $e^A = (10, 10)$ and $e^B = (0, 0)$. The Second Theorem of Welfare Economics tells one what to do: in order to reach a more egalitarian outcome, one should redistribute the endowments of the individuals in roughly the desired direction and let the market do the rest. Therefore, if a social planner, "the state", or politicians have sufficient coercive power to administer this type of redistribution, then there is no tension between efficiency and equity.

One should devote some more effort to deeply understanding the meaning of the welfare theorems. A modern economy is an unbelievably complex social arrangement, where millions and billions of decisions are made every day. Each decision has a tiny influence on the way goods and resources are distributed among individuals. If I decide to spend CHF 150 for a new pair of sneakers, I am revealing that the pair of sneakers are worth more to me than their price and, at the same time, they must be worth less to the producer, because the purchase is voluntary. Thus, trading the sneakers is efficiency-enhancing. On that note, if there are people who are willing to sell sneakers at the given market price, they will enter the market. Given that this process only stops when the willingness to pay of the "last" buyer equals the willingness to sell of the "last" seller, markets are Pareto-efficient and goods and resources are directed towards their most efficient uses. There is no centralized planner with information about the willingness to buy and sell of billions of individuals to get to this point: the only thing that is needed is that individuals have information about the prices that are relevant for them.

At the same time, I am revealing that CHF 150 for a pair of sneakers is worth more to me than any other alternative use of the money, including saving the money for my future (concept of opportunity costs). This creates a link between the market for sneakers and *all other* markets. This complicated network of markets makes sure that signals about relative scarcity are transmitted in a way that guides resources towards their most efficient uses. If, for example, a technological innovation in the IT sector (for example a new accounting software) creates a substitute for a

traditional job, like an accountant, which has capital costs lower than the wage rate, then firms will start replacing accountants with software. If software is cheaper to use, it reduces the costs of production, which reduces the firm's willingness to sell. For given market prices, profits increase, but the firm will ultimately be pressured on market prices, because high profits will encourage market entry. Hence, the technological innovation influences the price of the goods that are produced with this technology and makes them relatively cheaper compared to other goods. This effect, again, redirects consumer behavior: if the good is ordinary, consumers will buy more of the cheaper goods, increase consumption of their complements, and reduce consumption of their substitutes, which has effects on these markets, as well. Therefore, the effect of a relatively local technological change will ultimately be spread over the whole economy, leading to adjustments in all kinds of markets.

How about the accountant? The technological innovation created a substitute for his job, making him compete with a new technology. The only way for the accountant to keep his job is to be willing to reduce his wage to the point where the employer is indifferent between using the new computer software and human labor. In this sense, wage rates also signal relative scarcity: the emergence of new technologies makes this specific type of labor less scarce, leading to lower prices (wages). In the long run, this reduction in wages is an important signal, because it discourages people from becoming accountants, making labor available for more valuable uses. Thus, wage rates are also an important signal of scarcity that support individuals in their decisions to qualify for certain jobs. However, this knowledge may be of little help for a fifty-year old accountant with two young kids and a mortgage to pay, who becomes unemployed.

Should one trust the theorems of welfare economics? There are three points that should be mentioned before one can reach a conclusion:

- The reason why there is no tension between efficiency and equality in the example is that redistributing exogenous endowments has no adverse incentives for the individuals. The amount of ingredients that are available for baking the cake do not depend on the initial property rights of the ingredients. If this were the case, redistribution might have adverse incentive effects. For example, if the state levies an income tax, people are likely to be discouraged from working. In this case, there is a tension between efficiency and equity, because moving into the direction of more egalitarian outcomes shrinks the pie. Therefore, the policy advice that follows from the Second Theorem of Welfare Economics is to look for "tax bases" that do not react to redistributive policies. However, such tax bases are rather limited. The only ones that come to mind are land plus the natural resources in the ground (but, even in this case, the willingness to extract them may depend on the tax system), potential ability of the people, like IQ (but there is a lot of evidence that IQ is, to a certain extent, a function of effort), or the individual himself (which is called a *head tax*). All other tax bases may react to changes in redistributive policies. Hence, the range of applicability of the theorem, in its pure form, is rather narrow, but the general insight is very important: if one wants to minimize the efficiency costs of egalitarian policies,

one should try to identify tax bases that are as independent as possible from the redistributive policies.

- In order to be able to impose and enforce redistributive policies that are in line with the Second Theorem of Welfare Economics, the agency that is in charge needs sufficient independence and sufficient coercive power to be able to enforce the policies. *Independence:* coming back to the apple-pear example, it is likely that the endowment-rich Ann will oppose redistributive policies and she has at least two channels to be effective in this respect. First, she can try to influence the agency's decisions, for example by lobbying. Putting politicians on the payroll of the rich is a very effective way to prevent even worse redistributive policies (from the point of view of the rich). Therefore, the quality of political institutions becomes important in determining whether redistributive policies can be implemented or not, if one cannot rely on the intrinsic motivation of the politicians and bureaucrats to execute them. *Coercive power:* a second problem, which has to do with the quality of political institutions, is the ability of the agency that is responsible for redistributive policies to actually enforce them. Ann, for example, could try to shield her fortune by complicated tax-avoidance strategies, trusts, etc. If the agency has only limited means to enforce its policies, then it has to rely on the voluntary cooperation of the "rich."
- The third point worth mentioning is more methodological. In the apple-pear example, the "state" would like to enforce the egalitarian solution $(5, 5), (5, 5)$. However, if this is the case, why do they choose the detour $(2, 8), (8, 2)$ and rely on markets, instead of choosing the desired allocation directly? Looking at the problem from this angle shows that the second theorem is, of course, correct, but it does not provide us with a strong argument in favor of competitive markets, because it is unclear why markets are needed in the first place.

5.3 Is One's Willingness to Pay One's Willingness to Pay?

The argument about the efficiency of market equilibria relies heavily on a rather innocuous-looking, implicit assumption about the relationship between the willingness to pay and the "true" willingness to pay of individuals. Research, which has been primarily conducted by so-called "behavioral" economists, neuroscientists and psychologists has increasingly scrutinized whether one can always identify the expressed willingness to pay or sell with the "true" willingness to pay or sell.

✍ The identification of both is an example of what economists call the *theory of revealed preference*, which makes the point that the true, normatively relevant preferences of a person can be elicited from his or her (market) behavior. This conjecture has strong implications for the normative evaluation of individual choices, because it implies that individuals make no mistakes when they choose among different alternatives. This does not mean that they never regret their choices, but that any regret is a necessary consequence of resolved uncertainty: I caught a virus during my trip to a foreign country so, *ex-post*, I would have preferred to have stayed

at home. However, *ex-ante*, before the trip, and given my subjective assessment of the risks, it was still the right decision.

Whether or not the observed willingness to pay is a reliable measure for the actual preferences of the individuals is a highly controversial and disputed question, because much is potentially at stake. If one assumes that people sometimes do not know what is best for them, then the door is wide open for paternalistic interventions that undermine individual freedoms. However, at the same time, not interfering with individual freedoms implies that those who understand those weaknesses and design products and pricing strategies to their advantage can exploit systematic weaknesses in the ability to make correct decisions. I will come back to this point in Chap. 10 when discussing pricing strategies.

A comprehensive overview of so-called behavioral biases, which point towards a gap between the actual and the revealed interests of people, would be far beyond the scope of this book, but this subchapter will use two examples to illustrate the point:

- There is a lot of experimental evidence that decisions can depend on apparently arbitrary "anchors." *Anchoring* describes a process from behavioural economics, based on which one can influence people's estimates with arbitrarily suggested associations – even if the association, the so-called anchor, is completely unrelated. For example, if one asks people whether Gandhi was older than 114 when he died and then ask them for his age of dying, one will get higher estimates then if one asks whether he was older than 35. In a famous experiment, researchers demonstrated how arbitrary and irrelevant information can influence the willingness to pay. MBA students could buy a bottle of wine. In a first step, they were asked if they would be willing to pay an amount that equals the last two digits of their social-security number. In a second step, they were asked how much they would actually be willing to pay for the bottle of wine. According to standard theory, the social security number should have no influence on their willingnesses to pay for the wine. In practice, however, it turned out that students with a social-security number that ended with a number below 50 were willing to pay significantly less than those whose social-security number ended with a number above 50. The average willingness to pay in the former group was €11.62, whereas the other group was willing to pay €19.95, on average. Bringing the social-security number to mind makes it an anchor from which the subjects develop their estimates. It implies that completely irrelevant information can influence one's willingness to pay, even for relatively ordinary products like wine, which challenges the idea of revealed preference, because decisions to buy or sell are likely highly context dependent and the specificities of the context that will determine decisions are hard to anticipate. People are especially prone to anchoring effects when they make financial decisions and it can explain a number of marketing strategies like arbitrary rationing: customers will, on average, buy more items in sales promotions if one sets a (high) limit than if one sets no limit at all.

- Another effect is called *ego depletion*. A number of studies have shown that people who are confronted with a challenging cognitive task and a temptation (like eating chocolate) are more likely to give in to the temptation than people are who do not have to solve the cognitive task. The term *ego depletion* reflects the fact that the cognitive task exhausts important aspects of the personality: motivation and self-control. Ego depletion has a lot of behavioral consequences, from aggressive responses to status-oriented behavior. However, from the point of view of willingness to pay, the most interesting consequences are the following: people with depleted egos are more prone to overspending and impulsive purchases (people, for example, are more prone to impulsive purchases after a long day of work, which partly explains why some companies concentrate internet adds during this part of the day), and they have a harder time abiding their diet. Therefore, economic decisions, which are made with a depleted ego, will likely be regretted and one cannot infer the "true" preferences from the observed behavior.

What are the areas where it is very likely that individuals do not consistently act according to their true interests? Loewenstein, Haisley and Mostafa (2008) give an overview: "There are areas of life [...] in which people seem to display less than perfect rationality. For example, although the United States is one of the most prosperous nations in the world, with a large fraction of its population closing in on retirement, the net savings rate is close to zero and the average household has $8,400 worth of credit card debt. Fifty percent of U.S. households do not own any equities, but the average man, woman and child in the U.S. lost $284 gambling in 2004, close to $85 billion in total. Many workers don't max out' on 401k plans despite company matches (effectively leaving free money 'on the table') and what they do invest often goes undiversified into their own company's stocks or into fixed income investments with low long-term yields. At lower levels of income, many individuals and families sacrifice 10–15 percent of their paycheck each month to payday loans, acquire goods through rent-to-own establishments that charge effective interests rates in the hundreds of percent, or spend large sums on lottery tickets that return less than fifty cents on the dollar. Worldwide, obesity rates are high and rising rapidly, and along with them levels of diabetes and other diseases, and people with, or at risk for, life-threatening health conditions often fail to take the most rudimentary steps to protect themselves."

If one takes this list at face value, a pattern becomes visible: the decisions that require a minimum degree of financial literacy, far-sightedness and commitment seem to be the ones where people struggle the most. Maybe our evolutionary past did not shape our brains in a way that makes it easy for us to handle these problems, because they have not been very relevant for the better part of the history of our species.

If one agrees that there are economic decisions where it is uncertain whether an individual is acting according to his or her well-understood interests, then the revealed-preference paradigm is hard to defend and, if one cannot defend it, then one can no longer be certain that consumer and producer surplus are an adequate

measure of welfare, which – finally – leaves the relevance of the welfare theorems up in the air. This assessment does not imply that competitive markets are not efficient, if the revealed-preference paradigm cannot be defended in a substantial number of market contexts. What it implies, however, is that one cannot build one's understanding of Pareto efficiency on the welfare theorems.

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