

Chapter 7

Buchanan and Arrow on Democracy, Impossibility, and Market

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It is a historical fact about the publication of Kenneth J. Arrow's *Social Choice and Individual Values* that it was received at once as both a triumph for free market capitalism as well as a striking indictment of political, particularly democratic, forms of organization (Amadae 2003, 83–132). Yet this reception of Arrow's stunning impossibility theorem is puzzling. For Arrow—from the very first sentence of *Social Choice and Individual Values*—saw his impossibility result as indicting both voting *and* the market as irrational methods of collective choice. In the very opening of the text, Arrow remarks that “in a capitalist democracy there are essentially two methods by which social choices can be made: voting, typically used to make ‘political’ decisions, and the market mechanism, typically used to make ‘economic’ decisions” (Arrow [1951] 2012, 1). These “methods of voting and the market . . . are methods of amalgamating the tastes of many individuals in the making of social choices” (Arrow [1951] 2012, 2). Because both the market and democratic voting procedures are methods of making social choices, Arrow stipulates that “in the following discussion . . . the distinction between voting and the market mechanism will be disregarded, both being regarded as special cases of the more general category of collective choice” (Arrow [1951] 2012, 5). But even though Arrow seems quite clear on the scope of his impossibility result, the general view in the literature is that “Arrow's contribution provides incontrovertible support for market process and encouragement for those who seek to constrain the range of collective choice to the limited functions of the minimal state” (Rowley 1993, xiii).¹

As he did in many other instances, James M. Buchanan stands as the exception here. In his 1954 paper, “Social Choice, Democracy, and Free Markets,” Buchanan offers a spirited review of Arrow's then recently published

monograph. Though many subjects are touched upon in the review, Buchanan does address Arrow's claim that his impossibility theorem indicts the market as an irrational method of collective choice. Not only does Buchanan actually acknowledge Arrow's indictment of the market—*contra* the rest of the literature surrounding Arrow's impossibility theorem—but he also argues that this claim is false: Arrow's impossibility theorem indicts democratic voting procedures as irrational methods of collective choice but leaves untouched the market.² This chapter hopes to adjudicate this debate, which has received shockingly little attention in the massive social choice literature: is Arrow correct that his impossibility theorem indicts both voting and the market as irrational methods of collective choice? Or is Buchanan correct that only democratic voting procedures are damned to irrationality?

Here is how we pursue this question. We begin in the next section by introducing some terminology from the social choice theory literature to make more precise our guiding question (§2). After doing so, the next three sections ask these questions: Are there any differences between voting and the market that could plausibly justify Buchanan's claim that democratic voting procedures are indicted by Arrow's powerful impossibility theorem but the market is not? We first examine whether the right kinds of *preferences* are inserted into the market for the market to be indicted by Arrow's troubling result (§3). We then ask whether the market has the right kind of *output* for it to be indicted by Arrow's theorem (§4). As we shall see, both attempts to vindicate Buchanan's claim that there is a relevant difference between voting and the market—that bodes ill for voting but well for the market—do not succeed.

But our final attempt *is* successful: because of certain features of the market process articulated by Buchanan, the market cannot be modeled within the social choice theoretic framework generally speaking, meaning that Arrow's impossibility theorem, as well as other impossibility-like results, do not indict the market as an irrational method of collective choice, even though such results do still indict democratic voting procedures as irrational methods of collective choice (§5). Pursuing this line of inquiry leads us to explore a fascinating and under-examined debate between Buchanan and Amartya Sen concerning the nature of markets, collective choice, and collective rationality. There is a concluding section.

THE NATURE OF SOCIAL CHOICE

Before diving into whether Arrow's impossibility theorem indicts voting and the market as Arrow claims, or just voting procedures as Buchanan does, we need to introduce some terminology and further refine our guiding question.

Arrow's theorem is an important theoretical result concerning the nature of *social welfare functions*. Social welfare functions are defined as follows:

By a *social welfare function* will be meant a process or rule which, for each set of individual orderings of alternative social states (one ordering for each individual), states a corresponding social ordering of alternative social states. (Arrow [1951] 2012, 23)

Following Arrow's definition here, we can break down the idea of a social welfare function into three distinct components. First, individuals have preference orderings over different choice options. As an example, individual i might prefer x to y to z , individual j might prefer y to z to x , and individual k might prefer z to x to y . Second, a set of aggregation rules is applied to these individual preference orderings. And third, as a result of applying these aggregation rules, one *social ordering* of these choice options is derived. So from application of aggregation rules to i 's, j 's, and k 's preferences, our social welfare function derives the social ordering that, say, y is preferred to z is preferred to x .

Importantly, it is assumed that both the individual orderings social welfare functions take as their input and the social ordering social welfare functions produce as their output satisfy certain conditions. Namely, such orderings are *complete* and *transitive*.³ By complete it is meant that for *any* two choice options x and y individuals are presented with, individuals are able to rank these options: they can say that x is preferred to y , y is preferred to x , or they are indifferent between x and y . The same applies for the social ordering derived by our social welfare function: the ordering must be able to say whether x is preferred to y , y is preferred to x , or that society is indifferent between x and y . By transitive it is meant that if an individual thinks x is preferred to y and y is preferred to z then this individual must also think x is preferred to z . Again, the same applies for the social ordering derived by our social welfare function: if our social ordering says x is preferred to y is preferred to z then x is preferred to z .

Though completeness and transitivity do seem intuitively plausible, why insist that individual preference orderings and our social ordering produced by our social welfare function *must* satisfy these conditions? It is generally held in the literature that to make a rational choice means that one chooses an option from the *choice set*, which is defined as the set of all alternatives that are at least as good as every other feasible alternative (Arrow [1951] 2012, 12; Sen [1970] 2017, 55, 60).⁴ Likewise, to make an irrational choice is to choose an option *not* in the choice set. It can be shown, however, that when completeness and transitivity are satisfied, it is *guaranteed* that there will be a nonempty choice set (Sen [1970] 2017, 61).⁵ But if the choice set is empty,

and if rationality requires choosing from the choice set, then it is *impossible* to make a rational choice. As such, if completeness and transitivity are satisfied we guarantee that it is always possible to make a rational choice; but, if one of these conditions is violated and we end up with an empty choice set, then a rational choice simply cannot be made. As we shall see, Arrow's theorem essentially asks if there exists a social welfare function satisfying certain intuitively plausible axioms. He proves that any function satisfying such axioms can end up producing a social ordering that is intransitive: x is preferred to y is preferred to z is preferred to x . In such a case, there may be an empty choice set for our social ordering, which, since rationality requires choosing an option from the choice set, means that "there cannot really be said to be any rational choice in this case" (Arrow [1951] 2012, 12). Hence, irrational collective choices.

What are the conditions Arrow places on social welfare functions? They are as follows:

Pareto: For all choice options x and y , if all individuals prefer x to y , then the social ordering must say that choice option x is preferred to choice option y .

Universal domain: All logically possible orderings of individual preferences are admissible into the social welfare function.

Nondictatorship: There exists no individual i such that, for all choice options x and y , if individual i says x is preferred to y , then the social ordering says that x is preferred to y .

Independence of irrelevant alternatives: For all choice options x and y , the social ordering of x and y depends *only* on how individuals order x and y .

These axioms are, I think, intuitively plausible. Pareto simply says that unanimity over how to order two options among individuals is sufficient to determine the social ordering of these two options. Universal domain says that individuals may order options in any manner they please. Nondictatorship says that one individual cannot run the whole show. Though a little less intuitive than the others, independence of irrelevant alternatives can serve a deeply important function: as many have noted, there is a strong connection between independence and a social welfare function being free from problems of manipulation (Patty and Penn 2014, 48–50; Kogelmann 2018, Lemma 1). Arrow's impossibility theorem says that there exists no social welfare function simultaneously satisfying Pareto, universal domain, nondictatorship, and independence of irrelevant alternatives that is also always able to produce a transitive social ordering. And, as we have seen, when transitivity fails, the choice set may be empty, meaning that we are forced to make an irrational choice.

With our terminology out of the way, we can now ask this: What must be done to show that the market, like voting, is indicted by Arrow's impossibility

theorem as an irrational method of collective choice? Two things. First, it must be shown that the market is a *social welfare function*, since Arrow's analysis, we have seen, applies to social welfare functions. Second, it must be shown that the market satisfies the axioms Arrow places on social welfare functions: Pareto, universal domain, nondictatorship, and independence of irrelevant alternatives. If the market *is* a social welfare function and *does* satisfy the relevant axioms, then Arrow is right and Buchanan is wrong, and the impossibility theorem indicts the market along with democratic voting procedures as capable of making irrational social choices. If the market is *not* a social welfare function, or if the market does *not* satisfy the relevant axioms (say, violates Independence), then Arrow is wrong and Buchanan is correct, leaving standing the market where political processes collapse into irrationality. For the rest of the chapter we focus exclusively on the first question—whether the market is a social welfare function—and leave aside the second—whether the market, as a social welfare function, satisfies the relevant axioms. If the market does not have the structure of a social welfare function then Arrow's impossibility result does not indict it as an irrational method of collective choice, leaving Buchanan as the victor in this debate.

TASTES AND VALUES IN THE MARKET AND THE VOTING BOOTH

One relevant difference between voting and the market emphasized by Buchanan is that individuals oftentimes behave differently when engaged in political processes than they do when engaged in the marketplace due to different institutional conditions. Why are behavioral differences, though, relevant in determining whether the market is a social welfare function or not? Depending on how one defines the individual preference orderings—particularly, what preferences are representations *of*—that social welfare functions take as their input, behavioral differences between the marketplace and democratic political processes could be relevant in determining whether the market is a social welfare function (and, indeed, whether voting procedures are social welfare functions as well). We thus need to know the relevant behavioral differences individuals display when acting in the market and acting in the public forum, as well as how Arrow defines the individual preference orderings that social welfare functions take as their input and transform into social orderings.

In his paper, “Individual Choice in Voting and the Market” ([1954a] 1999), Buchanan argues that there are six major institutional differences between the marketplace and the voting booth that lead individuals to behave differently in these two settings: (1) the *degree of certainty* is different in the market

and the public forum, causing voters to behave in a choice under uncertainty framework in the voting booth rather than a choice under certainty framework as they do in the marketplace; (2) the *degree of social participation* is different in the market than it is in democratic voting procedures, which causes individuals in the voting booth to be moved by other-regarding considerations in comparison to the market where individuals are purely selfish; (3) the *degree of responsibility* is different in the market than it is in political processes, which causes individuals in the market setting to think more carefully about their choices than they do in political settings; (4) the *nature of the alternatives presented* in the market and in voting processes is different, which allows individual market choices to be more articulate than individual political choices; (5) the *degree of coercion* is asymmetrical when comparing the market to the political forum, which can cause political actors to try to minimize their sense of regret when choosing in the voting booth, something that does not often happen in the marketplace; and (6) the *power relations among individuals* are different in the market than they are in democratic political processes, in that in the market there are stark inequalities in “votes,” whereas in (most) political procedures there is one vote per person. This can lead to innumerable behavioral differences.

Suppose Buchanan’s analysis is correct and that there are significant behavioral differences between how individuals act when engaged in the marketplace and how individuals act when participating in democratic political processes. But what does this have to do with determining whether the market is a social welfare function or not and thus subject to Arrow’s impossibility indictment? As already mentioned, part of the definition of a social welfare function is that the input of the function is a set of individual preference orderings that are then transformed by a rule or process into a social ordering. Depending on how these individual preference orderings are defined, the behavioral differences stated by Buchanan could be quite impactful.

So how does Arrow understand the individual preference orderings social welfare functions take as their input? Here Arrow draws an important distinction between *tastes* and *values*:

In general, there will, then, be a difference between the ordering of social states according to the direct consumption of the individual and the ordering when the individual adds his general standards of equity (or perhaps his standards of pecuniary emulation). We may refer to the former ordering as reflecting the *tastes* of the individual and the latter as reflecting his *values*. (Arrow [1951] 2012, 17)

Following Buchanan’s insights while adopting Arrow’s terminology, individuals in the marketplace are moved by their tastes, while individuals engaged in democratic political processes are moved by their values. Thus, if

we define the social welfare function's input as individual preference orderings representing exclusively tastes then it follows that the market *is* a social welfare function while voting is *not* a social welfare function. And, if we define the social welfare function's input as individual preference orderings representing exclusively values, then it follows that voting *is* a social welfare function while the market is *not* a social welfare function. So how does Arrow understand individual preferences and individual preference orderings? As representations of tastes or values?

That is left open. For Arrow, "it is simply assumed that the individual orders all social states by whatever standards he deems relevant" (Arrow [1951] 2012, 17). Thus, preferences can be representations of *both* tastes and values, depending on what is relevant for the individual. Following Buchanan, when engaged in the market, only individuals' preferences over consumption goods are relevant. As such, when the market acts as a social welfare function (if it does) it transforms individual tastes into a social ordering. Again, following Buchanan, when in the voting booth, individuals' values are relevant. As a result, when democratic processes act as social welfare functions, they transform individual values into a social ordering. Given Arrow's definition of social welfare functions, individual behavioral differences in the market and the public forum do not bear on the question as to whether the market is a social welfare function and, thus, indicted by the impossibility theorem. Buchanan's insights here thus cannot serve to justify his claim that Arrow's impossibility theorem indicts voting but leaves untouched the market.

MARKETS, VOTING, AND SOCIAL ORDERINGS

The last section tried to vindicate Buchanan's thesis that the market is not indicted by Arrow's theorem as an irrational method of collective choice by focusing on what the *input* of a social welfare function is. This section tries to vindicate Buchanan's thesis by now focusing on what the *output* of a social welfare function is. According to Arrow's definition of a social welfare function, such functions produce an ordering of social states. By this it is meant that, for all possible social states x and y , that individuals order in their preference rankings, social welfare functions produce a new social ordering, where society says either x is preferred to y , y is preferred to x , or society is indifferent between x and y .

If the market is a social welfare function, then it must be that the market produces a social ordering of all possible social states that individuals order in their preference relations. But in what sense *does* the market actually do this? It is hard to see. Clearly, the market produces a state of affairs. If, following Buchanan in §3 above, we agree that the input of the market mechanism is

individual preference orderings over consumption goods, then it is clear that the market, indeed, produces a resulting distribution of such goods. But does the market produce an ordering of all possible distributions of consumption goods that individuals might have preferences over? Clearly not. We know what the ultimate distribution of consumption goods (c_u) that the market produces is. But, for any two other possible distributions of consumptions goods (c_{p1} or c_{p2}) that could have been realized, the market does not tell us if society prefers c_{p1} to c_{p2} , if society prefers c_{p2} to c_{p1} , or if society is indifferent between c_{p1} and c_{p2} . All we know is that c_u was realized. Because the market does not produce an ordering of social states, it does not fit the definition of a social welfare function. But if the market does not fit the definition of a social welfare function, then Arrow's impossibility theorem does not indict it as a potentially irrational method of collective choice. This seems to vindicate Buchanan's thesis that voting procedures run afoul of Arrow's impossibility result while the market does not.

In response it might be argued that most democratic political procedures do not produce social orderings either. We often use voting methods to select one and only one candidate, not to produce a social ordering of all the candidates running in a given race. By the same logic, it seems that *both* democratic political processes *and* the market mechanism fail to have the requisite output. But, though voting mechanisms are not typically used to induce a social ordering, most voting mechanisms can be employed to create such orderings. For instance, we often think of simple majority rule as selecting one and only one candidate because it is used in two-person races—either Candidate 1 gets more than half the votes or Candidate 2 gets more than half the votes. However, we can use simple majority rule to construct an ordering over a whole field of candidates. We do so by conducting a pairwise majority vote over all logically possible pairs of candidates. So, if the field consisted of three candidates—Candidate 1, Candidate 2, and Candidate 3—we construct a social ordering using simple majority rule by taking a majority vote of Candidate 1 vs. Candidate 2, Candidate 2 vs. Candidate 3, and then Candidate 1 vs. Candidate 3. If we do this, then simple majority rule is employed as a social welfare function: namely, as the Condorcet voting method. So, though voting rules are often not employed to induce social orderings and, thus, are often not employed as social welfare functions, we see how, in principle, they can be. But is there something analogous for the market? Though the market is never in practice employed to induce a social ordering, can it in principle be done as required by the social welfare function framework? I cannot think of a way the market mechanism can be employed to create a social preference relation. It, thus, cannot be a social welfare function. Voting procedures, though they are often not employed as social welfare functions, can in principle be employed for such purposes.

If the market is not a social welfare function due to its inability to induce a social ordering, can we classify the market as any kind of social choice mechanism? We can plausibly understand the market as a *social choice function*. A social choice function is a rule or process that takes individual preference orderings as its input and yields a single social choice as its output. More simply, a social choice function is a rule or process that takes individual preference orderings over social states x , y , and z as its input and then yields a single social state—either x , y , or z —as its output. The social choice function framework in contrast to the social welfare function framework intuitively captures what the market is. The market is indeed a process that takes as its input a series of individual preference orderings. Moreover, one single social state is produced by this process via the market mechanism. Note, voting procedures are often employed as social choice functions. That said, voting procedures can be employed to create social orderings and not just make single social choices. The market, however, cannot. So though democratic voting procedures *can* be social choice functions, they are not *necessarily* social choice functions. This is not so with the market.

Terminological distinctions are interesting, but they are not really what we are after. Our guiding question is whether the market, like voting, is subject to Arrow's impossibility result as Arrow says it is and, thus indicted as a potentially irrational method of collective choice along with democratic voting procedures, or whether Buchanan is correct and the market remains free from such aspersions. Does understanding the market in terms of a social choice function change the implications of Arrow's analysis? It has to. This is because—as we noted in §2 above—the logic of Arrow's theorem is to show that certain conditions on how we derive a social *ordering* can force that *ordering* to be intransitive, which can lead to empty choice sets and, thus, irrational social choices. But once we are no longer concerned with social orderings but rather single social choices, there is nothing we can actually show to be intransitive. Thus, Arrow's impossibility theorem, as a conceptual matter, does not apply to the market. The theorem shows that social orderings may be intransitive if certain axioms on the mechanism that induce the ordering hold. But the market induces no such ordering at all. It merely induces a single social choice.

So Arrow's impossibility theorem does not indict the market, because the market fails to have the requisite output. But though Arrow's claim is technically false and Buchanan's technically true, we may be able to keep the spirit of Arrow's claim alive by comparing the market, interpreted as a social choice function, to democratic voting procedures, *also* interpreted as social choice functions. For though democratic voting procedures are not necessarily social choice functions as the market is, in that they can be employed to induce social orderings and thus run afoul of Arrow's impossibility result,

they are often employed to induce single social choices only. More precisely, to keep the spirit of Arrow's original claim alive, we can ask this: Is there a fundamental difference between the market mechanism and democratic voting procedures when the two are understood as institutions solely used to make social choices rather than induce social orderings? Are both inherently flawed—as Arrow thought they were—when used as mechanisms to induce social choices?

Relevant now is Buchanan's review of Arrow's monograph, "Social Choice, Democracy, and Free Markets," discussed in the introduction of this chapter. In this review, Buchanan advances several criticisms of the Arrow impossibility result, one of which is that "the voting process is fundamentally different from the market process *when the two are considered as decision-making processes rather than as bases for deriving social welfare functions*" (Buchanan [1954b] 1999, 90; emphasis added). What Buchanan says here is of key interest given our new guiding question. For Buchanan argues that once we start thinking in terms of simply making social choices rather than deriving social orderings, there *is* a difference between voting and the market, contra Arrow who draws no distinction between the two. Namely, Buchanan argues that, even though social choice functions institutionalized as democratic voting procedures can result in inconsistent choices, the market, a different way of institutionalizing the social choice function, cannot:

In the consideration of voting, it is a relatively simple step to discard the social rationality or social welfare function implications and to utilize Arrow's conditions in testing the consistency of the choice process. When this is done, it is found that ordinary majority rule does not necessarily produce consistent choices . . . When the market is considered, however, a different result arises when the process is tested for consistency of choice from that which is forthcoming when one seeks to derive a social welfare function . . . the market does provide a means of *making consistent choices* as long as individual values remain unchanged. (Buchanan [1954b] 1999, 100; emphasis original)

According to Buchanan, once we start thinking in terms of social choices rather than social orderings, there *is* a difference between voting and the market. More important, once we begin working within the social choice function framework, voting is indicted as a process capable of making *inconsistent choices* while the market is not. Though this notion of inconsistent choice is different than the irrational social choices that Arrow was getting at with the impossibility result, Buchanan's claim here is still antithetical to Arrow's assertion that there is essentially no difference between democratic voting procedures and the market mechanism. Moreover, Buchanan's claim is also antithetical to Arrow's more general proposition that both voting and

the market are in some sense inherently flawed, though, again, the idea of inconsistent social choice is distinct from the idea of irrational social choice.

Nearly forty years after the publication of Buchanan's review essay, Amartya Sen took up Buchanan's critique, coming down in defense of Arrow's thesis concerning symmetry between voting and the market. In doing so, Sen argues that even if we understand voting and the market as mere processes that make social choices rather than processes that derive social orderings, we still run afoul of many counterintuitive, impossibility-like results. For instance, if one simply understands the market as a mechanism that makes single social choices, then one can show that, if the mechanism is subject to some constraints (these constraints are just reformulations of the axioms Arrow places on social welfare functions), then choices may be "internally inconsistent," in that they might violate commonly held consistency properties used to appraise the rationality of choice across different menus of options.⁶ This runs directly counter to Buchanan's claim that the "market does provide a means of *making consistent choices*" when interpreted as a social choice function. What is more, even if one drops the internal consistency requirements, it can still be shown that social choice functions run into problems. Writes Sen,

What happens, then, to Arrow's impossibility problem if no restrictions whatever are placed on the so-called 'internal consistency' of the choice function for society? Would the condition relating individual preferences to social choice (i.e., the Pareto principle, nondictatorship, and independence) then be consistent with each other? The answer, in fact, is no, not so. If the Pareto principle and the conditions of nondictatorship and independence are redefined to take full note of the fact that they must relate to social *choices*, not to any prior social *preference*, then a very similar impossibility reemerges. (Sen [1995] 2004, 270; Sen [1993] 2004, Theorem 3)

According to Sen, and in contrast to Buchanan, we do not have reason to be optimistic about how the market fares even when interpreting it as a social choice function. Social choice functions, generally speaking, regardless of whether the function in question is institutionally realized as a voting procedure or as the market mechanism; it will either produce inconsistent social choices or fail to yield a social choice at all. Buchanan is thus wrong to hold that the market as a social choice function is capable of making consistent choices in contrast to democratic voting procedures, because the results Sen produces apply to social choice functions generally speaking, regardless of their institutional embodiment. So even though we now interpret the market as a social choice function, it *still* seems that Arrow is right about there being no essential difference between the market and the public forum, and it *still*

seems that Arrow is right about both methods of collective choice being in some sense flawed, though the issue now is that both methods of collective choice may make inconsistent social choices across different menus of options, not irrational social choices as shown by the impossibility theorem.

BUCHANAN VERSUS SEN (AND ARROW) ON IMPOSSIBILITY AND MARKET

Something seems to have gone wrong with the Buchanan-Arrow-Sen discourse. Buchanan argues that once we start understanding voting procedures and the market mechanism as mere processes for making social choices, then there *is* a relevant difference between voting and the market, a difference that bodes well for the market yet poorly for democratic voting procedures, contra Arrow. Sen's response is to list formal properties of social choice functions, showing how these functions are condemned to potentially make inconsistent choices or fail to make social choices at all. Yet these formal properties of social choice functions apply to all such functions, regardless of how they are institutionally realized. Sen's response thus fails to address what Buchanan sees as a relevant difference between the two methods of collective choice. There must be something more to what Buchanan is getting at in his critique of Arrow, something Sen fails to pick up on.

Buchanan's initial review essay is not the paragon of lucidity; so much could have been lost in translation. Fortunately, Buchanan revisits Arrow's impossibility theorem and social choice theory more generally in a later paper. Buchanan begins,

In my early criticism of Arrow's analysis of the relationship between "social choice and individual values," I advanced two quite separate arguments. First, I questioned the whole normative framework that attributes positive value to consistency in a "social" ordering of alternatives . . . Second, I criticized Arrow's interpretation of "the market" as a social decision rule. I emphasized the emergent as opposed to the chosen properties of the allocative-distributive outcomes produced by market interaction. Market outcomes emerge from the separated but interdependent choice behavior of many actors, and, as emergent rather than explicitly chosen *social states*, these outcomes are not within the feasible choice set of either separate participants or the collectivity of individuals in the organized community. (Buchanan [1995] 2001, 203)⁷

Now there is quite a bit going on in this passage and we need to examine it closely. However, I do believe that in this passage is the heart of Buchanan's reason for claiming why, when interpreted as mere processes for making social choices, voting and the market differ and, more important, why the

market is not condemned to make inconsistent social choices, whereas voting procedures are by those troubling results produced by Sen, contra Arrow's original thesis.

Let us direct our attention in the above passage to Buchanan's focus on the "emergent properties" of the market process. By citing the emergent properties of markets, Buchanan makes reference to the spontaneous order tradition, which emphasizes how particular orders are "grown" or how they are the "result of human action but not of human design" (Ferguson 1767; Hayek 1973, ch. 2; Sugden 1989). As a spontaneous order the outcome of the market process—a completely described social state as Arrow defines it—is indeed the *result* of deliberate human choice, but not the *subject* of deliberate human choice. That is, though the resulting state of affairs the market produces can be understood as a completely described social state in Arrow's sense, this particular social state is not directly chosen by any actor in the marketplace. Rather, individual market actors make choices concerning specific commodities—that they would rather have a Ford instead of a Toyota, for instance. From these separate choices a fully described social state emerges via the market mechanism, even though individuals engaged in the marketplace were not in any sense ordering or choosing between the different social states that could potentially be realized.⁸

It is easy to misinterpret Buchanan's emphasis on the emergent properties of the market as making a rather simple point: that individuals simply do not, as an empirical matter, order and choose between completely described social states when engaged in the marketplace as Arrow assumes they do. When I go to the dealership and make a choice, I am not choosing a completely described social state containing information concerning the complete distribution of commodities for all individuals in society, the complete supply of labor for all individuals in society, and so forth. Rather, I am choosing a particular car. This interpretation of what Buchanan is saying, though, is not quite right. For if this was all Buchanan was getting at, then the social choice function framework could simply adapt by changing what the x 's and y 's represent in the formal apparatus: instead of individuals ordering and choosing social states and social choice functions choosing one social state to be realized, we could simply redefine what the relevant x 's and y 's stand for.

In emphasizing the emergent properties of the market process, Buchanan is saying that though *individuals* have preference over and choose between *commodities*, what the *market* chooses is indeed a fully described *social state*. In other words, when it comes to the market mechanism, *some* of the x 's and y 's represent commodities, but *other* x 's and y 's represent fully described social states. Because of this we cannot simply change what the x 's and y 's represent in the formal apparatus to better account for market behavior—we cannot simply say that all the x 's and y 's now represent things like Fords and Toyotas

because Buchanan is indeed right that the market process selects a fully described social state. Nor can we say that the x 's and y 's in the formal apparatus do represent social states, because it is simply false that individuals acting in the marketplace order and choose between fully described social states. Some of the x 's and y 's need to represent commodities, yet other x 's and y 's need to represent social states, for the market is a process that takes information concerning individuals' preferences over certain kinds of x 's and y 's and, via the market mechanism, chooses one very different kind of x or y to be realized. In this way the outcome of the market process is the result of deliberate human choice but not the subject of deliberate human choice. The social choice function framework—indeed, the social choice theoretic framework, in general, cannot model this.

The above was a bit abstract, so let us try to make things a bit clearer. Consider Figure 7.1. Figure 7.1. is a visual depiction of how social choice mechanisms, generally speaking, work. There is a rule or processes that individual preference orderings are inserted into. The output of the rule or process is either an ordering or a single choice, depending on whether we are working with social welfare functions or social choice functions. More important, the resulting social ordering or social choice yields either an ordering or a single choice of those options which the individuals order. Returning to figure 7.1., the x 's and y 's that the individuals order on the left side of the figure are then ordered or chosen by the rule or process, represented by the right side of the figure. In emphasizing the emergent properties of the market, Buchanan is saying that, when it comes to the market process, what the individuals are ordering on the left side of figure 7.1.—what the x 's and y 's represent—is not what the market ultimately chooses, on the right side of Figure 1. The x 's and y 's on the right side of the figure represent completely described social states which individuals do not order and choose in the market. They order and choose between simple commodities. But the market process transforms these orderings and choices over consumption goods into a completely described social state, as Arrow defines it. The social choice function framework cannot model this difference between what individuals order and choose and what is socially ordered or chosen. This implies that the market is not a social choice function, or a social choice mechanism more generally speaking. But if the market is not a social choice function, it is not subject

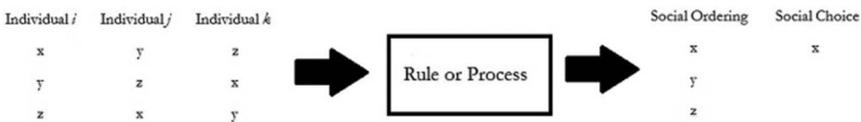


Figure 7.1.

to the troubling results Sen produces concerning social choice functions and inconsistent social choices.

Here is another way of thinking about what Buchanan is saying. We first asked in §3 whether the input of the market mechanism (the left side of figure 7.1.) is required in order for it to be a social welfare function by focusing on behavioral differences between voting and the market, particularly of what individual preference orderings are supposed to be representations. We then asked in §4 whether the output of the market mechanism (the right side of figure 7.1.) is as is required in order for it to be a social welfare function by asking whether markets induce social orderings, as social welfare functions by definition do. Buchanan's criticism of Arrow's indictment of the market focuses our attention on *both* the input and the output. The problem is that the social choice-function framework (and social choice theory, more generally) requires that what the individuals order and what is socially chosen be the same, but in the marketplace, individuals order specific commodities, yet a complete social state emerges as the result of the market process. The deep issue is not with the inputs or outputs *alone*, but rather an *asymmetry* between the input of the market process and the output of the market process. The social choice framework assumes symmetry here, yet this is not so with the market. In emphasizing the emergent properties of the market, Buchanan thus charges Arrow as failing to understand the distinct process the market undergoes to make social choices when compared to the processes democratic voting procedures use to make social choices.

Note, this asymmetry does not occur with democratic voting procedures as they typically operate. When individuals enter the voting booth, the x 's and y 's the individuals order are the same as the x 's and y 's that are chosen or ordered by the voting procedure. When I enter a voting booth, I have an ordering of candidates—I prefer Candidate 1 to Candidate 2 to Candidate 3. The voting rule then transforms this ordering plus every other citizen's ordering into either a social ordering or a social choice—Candidate 1 is elected, for example. With voting procedures, the x 's and y 's on the left side of figure 7.1. are the same as the x 's and y 's on the right side of figure 7.1. In this way voting procedures are not spontaneous order processes like markets are: the resulting state of affairs cannot be described as emergent, as is the case with the market. Candidates elected are both the result of deliberate human choice as well as the subject of deliberate human choice. By implication, the social choice-function framework *can* still accurately model democratic voting procedures. But because voting procedures can accurately be modeled as social choice functions, the troubling results Sen cites *do* apply to democratic voting procedures. Namely, they are methods of collective choice condemned to inconsistency across different menus of options.

As before, terminological distinctions are interesting but not what we are after. We are interested in whether Arrow is correct in saying that there is essentially no difference between voting and the market when we interpret them as processes for making single social choices, or whether Buchanan is correct in saying that there is some fundamental difference. Here is what we can conclude. The market, as a process for making social choices, cannot be modeled with the social choice function framework. The reason why is that the social choice–function framework (and social choice–theoretic framework, more generally) requires that individual orderings be over the same thing that is either socially ordered or socially chosen, this is not so for the market due to its emergent nature. By implication, those troubling results Sen cites showing how social choice functions run into inconsistency problems do not apply to the market process, because these results apply to the social choice function framework, but the market is not a social choice function. The market is not indicted as a decision procedure capable of making inconsistent choices.

Voting procedures *can* be modeled as social choice functions. The reason why is that the social choice–function framework (and social choice–theoretic framework more generally) requires that individual orderings be over the same thing that is either socially ordered or socially chosen, and this is the case for voting procedures. By implication, those troubling results Sen cites showing how social choice functions run into impossibility-like results do apply to democratic political processes, because these results apply to the social choice function framework, and voting procedures can accurately be modeled as social choice functions. Democratic voting procedures are thus indicted as decision procedures capable of making inconsistent choices. We conclude this: Arrow is wrong and Buchanan is right. Not only does the Arrow impossibility theorem not indict the market due to the market’s inability of inducing a social ordering, but there is furthermore a relevant difference between voting and the market once we interpret these institutions as merely making social choices rather than as deriving social orderings. Social choice theory leaves standing the market where democratic voting procedures are indicted as irrational and inconsistent methods of collective choice.

CONCLUSION

This chapter took as its inspiration comments James M. Buchanan made on Kenneth J. Arrow’s stunning impossibility theorem that revolutionized the discipline of economics in the mid twentieth century. It showed that Buchanan was correct in his original assessment. Such a conclusion, though, extends beyond a debate on the mere technical features of social choice

theory. As citizens of liberal market democracies, markets and democratic political processes are the two primary tools we can use to help us live better together. It is thus of the utmost importance for us to determine when one method of social choice should be employed over the other. Our conclusion concerning markets and collective rationality alone could not, of course, answer the normative question as to whether we ought to embrace democracy or the market, as there are other relevant considerations—the epistemic properties of both institutional systems (Landemore 2012; DeCanio 2014; Tebble 2016), the robustness of both institutional systems in the face of nonideal assumptions (Boettke and Leeson 2004; Pennington 2011), and so forth. Such a conclusion does, however, provide at least *some* support for market forms of organization over democratic ones, and thus *some* support for embracing markets as a way of helping us live better together. At the very least, the market will not lead to incoherent social choices.

NOTES

1. For further evidence see what Mackie (2003, 10–15) calls the “hall of quotations,” which contains many examples of social choice theory being used to indict democracy, leaving unmentioned the market—some of which explicitly use social choice theory to place market forms of organization above political forms of organization (e.g., Riker 1980; Riker 1982; Shepsle and Weingast 1984; Riker and Weingast 1988).

2. This is not the only criticism Buchanan advances. He also argues that it is incorrect to apply the individual conception of rationality standard in rational choice theory to collective decisions, a thesis expanded upon in Buchanan and Tullock ([1962] 1999, 31–33). He also argues that intransitive social preference relations can be a *good* thing, as jockeying back-and-forth between policies can be good for stability. This latter point was not picked up upon again until Miller (1983).

3. For further exploration of these conditions on rational choice as well as others, see Kogelmann and Gaus (2017).

4. We hereby set aside the possibility, raised by Sen ([1997] 2004, 181–89), that rationality only requires choosing from the maximal set, not the choice set.

5. Some might say that it is completeness, transitivity, and *reflexivity* that guarantee nonempty choice sets. On some ways of formulating the completeness axiom, however, completeness logically entails reflexivity, so we here state the simplified version of the result.

6. These consistency conditions are so-called expansion and contraction conditions, also known as the α and β consistency properties. For different formulations see Sen ([1977] 1982, §4). For philosophical investigation of these consistency conditions see Kogelmann forthcoming[b].

7. For similar remarks see Buchanan ([1996] 2001).

8. For further remarks by Buchanan on the nature of the market process, see Buchanan ([1982] 1999).

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