A Reformulation of the Foundations of Welfare Economics

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-Abstract-

Neoclassical welfare economics takes an outcome-oriented approach that uses Pareto optimality as its benchmark for welfare maximization. When one looks at the remarkable improvements in economic welfare that have characterized market economies, most of those improvements in welfare have been due to economic progress that has introduced new and improved goods and services into the economy, and the innovations in production methods that have brought costs down, leading to higher real incomes. Pareto optimality is only peripherally related to actual economic welfare, and no economist would argue that people are materially better off today than a century ago because the economy is closer to Pareto optimality. After analyzing the actual factors that lead to improvements in welfare, this paper suggests a reformulation of the foundations of welfare economics to replace the almost irrelevant outcome-oriented concept of Pareto optimality as the benchmark for evaluating welfare with a process-oriented benchmark based on factors that generate economic progress. The paper then explores some implications of this reformulation.

A Reformulation of the Foundations of Welfare Economics

The subject matter of economics has always revolved around how to design policies to improve economic well-being. Indeed, Smith's (1776) complete title, *An Inquiry Into the Nature and Causes of the Wealth of Nations*, reveals his intention to explain how people are able to create wealth by working together well beyond what any individual could achieve alone. He begins by saying (1776: 3), "The greatest improvement in the productive powers of labour … seem to have been the effects of the division of labour," and goes on to give the delightful example of the pin factory in which he argues that people are hundreds of times more productive when they specialize their labor, and increase their well-being by trading with others who specialize in different productive activities. Just by looking at the prosperity that characterizes the modern world – in those parts of the world that have a well-functioning market economy – there can be no doubt that economic welfare is advanced by the results of resource allocation within a market setting.

While economic welfare has always been the central subject matter of economics, modern welfare economics can trace its origins to Pigou's (1962) *The Economics of Welfare*, originally published in 1920. Pigou (1962:11) notes that there is a difference between economic and non-economic welfare, and limits his study to the former. Neoclassical welfare economics followed Pigou's lead in this regard, and this paper will do the same. Pigou (1962:12) goes on to note, "What we wish to learn is, not how large welfare is, or has been, but how its magnitude would be affected by the introduction of causes which it is in the power of statesmen or private persons to call into being." As a good student of Marshall, on the same page Pigou goes on to introduce a comparative statics element to his inquiry, noting that welfare economics would compare policies so that "… it will tell us how total welfare will differ from what it would have been if that cause had not been introduced, … and this is the information of which we are in search."

While the basic Pigouvian framework remains intact into the twenty-first century, welfare economics enjoyed major advances in the 1950s, based on the proof (Arrow and Debreu 1954)

of the uniqueness and stability of competitive equilibrium. Using competitive equilibrium as a benchmark for efficiency, the fundamentals of neoclassical welfare economics are well-explained by Bator (1957) and Graaf (1957), and the framework they describe remains current. Welfare maximization occurs when marginal rates of substitution in consumption are equal to marginal rates of transformation in production for all goods so that resources are allocated Pareto optimally. If those conditions are not met, the market fails, as Bator (1958) explains, and the policy goal of neoclassical welfare economics is to design policies that move the economy to a Pareto optimal allocation.[1] The formalization of conditions for welfare maximization advances Pigou's ideas by more rigorously defining what is meant by a welfare maximum, but is completely consistent with Pigou's framework. This is the foundation of welfare economics, and it is this foundation that this paper seeks to reformulate.

The first place to look to see why the foundations of welfare economics need reforming is at actual economic welfare in the real world. As much as Adam Smith marveled about the remarkable increase in the wealth of nations caused by the division of labor, modern economists must be all the more impressed by the wealth of nations in today's world. As Mokyr (1990), Landes (1998), and many others have noted, wherever market economies have been allowed to operate, prosperity follows. Cox and Alm (1999) observe that in the United States even those classified as poor at the end of the twentieth century had higher standards of living in many dimensions than the average American in 1970. When one looks at the remarkable increase in economic well-being over the past 20, 50, or 100 years, few would argue that the reason we are better off is that we are closer to Pareto optimality. Yet Pareto optimality remains the benchmark by which economic welfare is measured. Policies that move the economy closer to Pareto optimality are welfare-enhancing, and once the economy arrives at Pareto optimality welfare is maximized.

Vernon Smith (1974: 321) criticizes this neoclassical framework, saying, "… the microeconomic theory of the pre-1960s…" is a "dead end." He says, "Fortunately for the economy, but unfortunately for academic economics, this formulation of Pareto efficiency is not

the problem that real markets and other allocative institutions attempt to solve." Kohn (2004: 306) looks at the formal mathematical framework on which welfare economics is founded, which he traces back to Hicks (1939) and Samuelson (1947), and argues, "… the Hicks-Samuelson research program has done virtually nothing to assist in the formulation of economic policy." After giving some examples, Kohn goes on to observe, "This is not to suggest that economists as individuals have made no contribution. However, their advice has relied more on economic common sense than on high theory. It is difficult to see how a 19th century economist, or even one from the 18th century, would have made a less useful policy advisor than a tooled-up modern theorist."

Modern welfare economics, with its welfare-maximizing benchmark of Pareto optimality, is nearly irrelevant to actual economic welfare. While it is true that a Pareto improvement will increase welfare – by definition, because such a move makes some people better off, but nobody worse off – actual improvements in welfare are not the result of moving closer to a Pareto optimal allocation of resources; rather, welfare has improved because of the remarkable economic progress that has occurred since the beginning of the industrial revolution.

One might conjecture that the economy is further away from Pareto optimality now than a century ago. For one thing, wealthier people have more resources at their disposal with which to generate externalities. They can run their power lawnmowers early in the morning to disturb their neighbors, and drive their poorly-maintained automobiles, adding to air pollution. Also, in a more mobile society, people are less likely to have long-term relationships with their neighbors, lessening social pressures against the creation of externalities, and lessening social pressures against being a free rider. But, this is just a conjecture, and any observer can see that whether the conjecture is correct is nearly irrelevant to the advance of economic welfare in the real world.

To reformulate welfare economics, the place to start is with the factors that actually result in higher welfare in the real world. That is, the place to start is with the factors that generate real-world economic progress.

How Is Welfare Actually Maximized?

The appropriate place to begin in formulating a foundation for welfare economics is to look at what one is trying to measure. Following Pigou's lead, welfare economics should begin by looking at factors that improve people's material well-being. And, if one takes as a point of departure people's well-being in the real world rather than some theoretical framework, in the real world welfare is improved through economic progress. People were better off at the end of the twentieth century than they were at the beginning, for example, not because the economy was any closer to Pareto optimality at the end of the century, as neoclassical welfare economics seems to imply, but because economic progress had enhanced people's opportunity sets. People were able to engage in mutually advantageous transactions at the end of the century that were not possible at the beginning, and many of those transactions were made possible by transactions that had preceded them.[2]

Economic progress has increased the efficiency of the production process, replacing hand production with assembly lines – sometimes under robotic control – and has produced a new array of goods and services that people could consume. Rather than traveling by horse and buggy, or by steam locomotive, people travel in air conditioned automobiles and jet aircraft. They communicate via cellular telephones and over the internet rather than by mailing letters. They watch television for news and entertainment, in addition to reading newspapers and magazines. And they consume more of everything because increases in productivity came along with improvements in the types of goods and services produced.

Looking at real-world economic welfare, it is apparent that welfare maximization is not accurately described as arriving at a Pareto optimal allocation of resources. Rather, welfare is maximized by creating an institutional environment that facilitates economic progress, and gives entrepreneurs the incentive to introduce innovations into the economy that consumers value more highly than the status quo. Following Smith (1776), this enhances the division of labor, which Smith says is the source of "the greatest improvement in the productive powers of labour." Economic progress occurs as the division of labor increases as a result of an ongoing expansion

in the availability of mutually agreeable exchanges. Innovators search for profit opportunities, understanding that they can benefit by offering others exchange opportunities they would prefer to the status quo. This suggests a process-oriented approach rather than the neoclassical outcome-based approach that depicts welfare maximization as a static outcome.

Welfare is improved by lowering impediments to mutually advantageous exchanges so that people can engage in transactions that were not previously possible. The opportunity for such exchanges gives entrepreneurs the incentives to take risks and innovate to bring better products to market. As Smith (1776: 423) notes, the entrepreneur "intends only his own gain," but is "led by an invisible hand" to "promote the public interest." Welfare is maximized by policies that enhance this process that generates economic progress.

The Benchmark of Pareto Optimality

One might argue that the static nature of welfare economics as it developed in the last half of the twentieth century has been augmented by the development of general equilibrium growth models, building on Solow (1956), Lucas (1988), and Romer (1986, 1990), incorporating economic progress into the welfare economics framework. Within this framework, Pareto improvements remain welfare-enhancing, so the Paretian framework is completely capable of accounting for the welfare improvements generated by economic progress. Theories of economic growth will be discussed at greater length below. But, Pareto optimality has other problems that make it a poor benchmark for welfare maximization. Pareto optimality is a purely theoretical construct that has no real-world counterpart. It is unobservable, untestable, and there is no way to tell whether one is getting closer to a Pareto optimum.

Ever since Friedman's (1953) famous essay on positive economics, economists have placed a premium on theories that contain testable hypotheses: theories that can be falsified by looking at data. While positivism has had its critics (Lakatos 1978; Caldwell 1982; McCloskey 1985; Holcombe 1989, to name a few), if one actually wants to use Pareto optimality as a benchmark for judging whether a policy is welfare-enhancing, one must be able to observe the benchmark to

see whether a policy change would move toward it. Pareto optimality cannot be observed, and there is no possible empirical test to reveal whether an economy is at a Pareto optimum, or close to one.

The theoretical construct of Pareto optimality requires major assumptions for its existence. A minor assumption is that the economy is in equilibrium, with no remaining mutually advantageous exchanges that are unmade. The major assumptions are behavioral assumptions that define the utility functions of individuals and managerial behavior of firms. Utility functions must be transitive, exhibit diminishing marginal rates of substitution, and in a dynamic setting be stable (although the foundations of neoclassical welfare economics are built in a static setting where time is not an issue). Experimental and behavioral economists have called these assumptions into question (Kahneman, Knetch, and Thaler 1991; Kahneman 2003; Smith 1974), and if people's utility functions do not conform with the neoclassical assumptions, even if a competitive equilibrium exists it may not be Pareto optimal. The optimality result relies on the assumed utility functions underlying the Paretian framework.

Setting these problems aside and granting all the assumptions underlying the construction of a Pareto optimum, Lipsey and Lancaster (1956: 11), explaining the general theory of second best more than half a century ago, note, "… if there is introduced into a general equilibrium system a constraint which prevents the attainment of one of the Paretian conditions, the other Paretian conditions, although still attainable, are, in general, no longer desirable." Therefore (1956: 11-12), "… there is no *a priori* way to judge as between various situations in which some of the Paretian optimum conditions are fulfilled while others are not." One would think that the general theory of second best, by itself, would be enough to dissuade economists from using Pareto optimality as a benchmark for judging social welfare. For any policy change to be demonstrated as an improvement in welfare, that change by itself would have to result in a Pareto optimum. From a practical standpoint few economists would argue that the world is one step away from Pareto optimality, but regardless, because Pareto optimality is an unobservable and untestable concept, there would be no way to tell in any event.

Even when analyzed on its own terms, Pareto optimality is a purely theoretical construct that does not hold up as a benchmark for evaluating welfare in the real world. But, as the previous section noted, it would not provide an accurate measure of improvements in welfare anyway, because actual improvements in people's material well-being come almost entirely from economic progress, not from wringing static inefficiencies out of the economy.

Welfare Maximization as a Process, Not an Outcome

If one were to cling to the use Pareto optimality as a benchmark for welfare maximization, then once one reaches that Pareto optimal allocation of resources, welfare is maximized and cannot be increased further. Simple observation of the way that material well-being has increased over the years, decades, and centuries reveals how poorly this conception of welfare maximization fits the real-world facts. In the real world, welfare maximization is a process that has no theoretical maximum. Progress can keep occurring, and as it does, people's welfare can continue to improve. Welfare is maximized by those economic forces that create economic progress, and any movements toward Pareto optimality – while they may be beneficial, whether or not they can be observed – are mostly irrelevant to actual economic welfare. Not even the staunchest Paretian would argue that people's welfare was higher at the end of the twentieth century than at the beginning because the economy at the end of the century was closer to Pareto optimality. It may not even be true if an increasingly-interdependent economy generates an increasing level of externalities, but the larger point is that whether it is true or not is largely irrelevant to people's actual material well-being.

In the Paretian framework, Pareto optimality is a welfare maximum, with the caveat following Samuelson (1956) that if interpersonal utility comparisons can be made lump-sum taxes and transfers may further enhance welfare. This static notion of welfare maximization, in which once a welfare maximum is reached no further improvements are possible, is inconsistent with simple observation of the real world in which material well-being has continued to advance since the beginning of the industrial revolution, with no end in sight. Welfare maximization is not an

outcome, it is an ongoing process, so welfare economics needs to shift its foundation to be consistent with a process-oriented view of welfare maximization in which welfare can continue to advance, and in which there is no end-state that could be used as a benchmark against which welfare can be judged.

Welfare is maximized in an environment that maximizes the opportunity for economic progress, which points in the direction of identifying welfare-maximizing policies. Welfare maximization means enabling economic progress.

Pareto Optimality Versus Pareto Improvements

In contrast to Pareto optimality – an unobservable and irrelevant benchmark for welfare maximization – Pareto improvements do improve welfare and can be observed. A Pareto improvement occurs if at least one person is made better off without making anyone else worse off. If welfare maximization is a process, not an outcome, Pareto improvements are more applicable to people's actual welfare than Pareto optimality than Pareto optimality, because exchange is a process that improves the welfare of those engaging in it.

Some assumptions need to be made to conclude that exchange improves welfare, but the assumptions are weak compared to the assumptions needed to identify a Pareto optimum. By making one assumption – people are able to judge their own well-being to determine when an exchange makes them better off – Pareto improvements can be observed every time people engage in an exchange. There is no need to assume that utility functions are transitive or that indifference curves exhibit diminishing marginal rates of substitution. With the assumption that people engage in exchange to improve their well-being, the act of exchange by itself demonstrates that welfare has been enhanced, and by the definition of a Pareto improvement, a Pareto improvement has occurred. Pareto improvements can be observed just by observing the individuals who are party to the exchange, whereas observing Pareto optimality would require knowledge about the marginal conditions for every individual and every production process in the economy.

Whereas Pareto optimality is essentially irrelevant to actual economic welfare, Pareto improvements are the cause of improvements in welfare. However, one must look beyond simple exchange to see the relevance of Pareto improvements. While welfare is enhanced by exchange, economic progress that raises today's level of welfare beyond what existed before is the creation of exchange opportunities that did not previously exist. For example, prior to 1870 nobody in the United States could exchange anything for a banana, because bananas were not available in the United States. A Brooklyn entrepreneur, Minor Keith, built railroads in Costa Rica and planted bananas by the tracks for the purpose of importing them into the United States. As a result, Pareto-improving exchanges were possible that could not have occurred before, giving people in the United States the opportunity to consume bananas. Henry Ford provides a similar example, allowing people to buy automobiles who could not have purchased them before. Steve Jobs provides another example, allowing people to buy personal computers who could not have purchased them before.

If people have the opportunity to make the same exchanges they made in the past, their level of material well-being will be maintained. If people have the opportunity to make exchanges that were unavailable in the past – and they actually make those exchanges – their material well-being will be improved. They have demonstrated that in their behavior. By choosing the new opportunities over those previously available to them, they reveal that they are better off.[3] Pareto improvements are relevant to welfare maximization, then, not so much in the static sense of analyzing how people can exchange to make themselves better off, but in the dynamic sense of creating new opportunities for exchange that were previously unavailable. The creation of those new opportunities constitutes economic progress, and economic progress is what enhances welfare.

Growth Versus Progress

Since the 1990s, as a result of work by Lucas (1988), Romer (1986, 1990), and others, growth theory has been pushed into the mainstream of economic analysis. In one sense, the

causes of increasing prosperity have been at the foundation of economics since its beginning. If Adam Smith is the father of economics, the title of his 1776 book, *An Inquiry Into the Nature and Causes of the Wealth of Nations,* reveals his interest in, as his title says, understanding what creates prosperity. But this emphasis was side-tracked to a degree by Malthus (1798) and Ricardo (1817), who concluded that most people would always be stuck at a subsistence level of income, and interest in economic progress was completely derailed by the twentieth century equilibrium approach to economic analysis.

Economic analysis was revolutionized by Marshall's (1890) partial equilibrium approach to understanding markets, and Keynesian macroeconomics, based on Keynes (1936) but moreso on Hicks (1937), depicted the macroeconomy in an equilibrium framework paralleling Marshall's microeconomy. In the Keynesian framework, the policy goal was to arrive at an equilibrium with full employment and low inflation, which is similar to the policy goal of Pareto optimality in that once that goal is reached, no further improvements are possible. The equilibrium framework was further advanced by Hicks (1939) and Samuelson (1947), who laid the general equilibrium foundation for the neoclassical welfare economics described by Bator (1957) and Graaf (1957). Thus, the subject of economic analysis evolved from Smith's focus on the causes of prosperity to the twentieth century focus on understanding the properties of economic equilibrium.

Within this equilibrium framework the subject of economic growth was integrated through Solow's (1956) model that depicted an equilibrium growth path consistent with the static equilibrium represented by a Pareto optimal allocation of resources. Within this framework, output, Q, is a function, f, of inputs capital, K, and labor, L, or $Q=f(K,L)$. Growth is depicted by increases in Q, and the production function shows that this can be accomplished by increasing the inputs, K, and L, or by increasing the productivity of production by improving the production function. One can envision $Q=g(K,L) > Q=f(K,L)$, and growth can occur by shifting from production function f to production function g. Typically, this has been thought of as incorporating technological change.

As Lucas (1988) insightfully argues, L should be viewed not just as the number of laborers, but rather as a measure of human capital. Thus, looking at the production function, growth can occur by investments in physical and human capital, and by technological advances. In hindsight some evidence that this approach to economic growth leaves out some essential causal factors comes from economies that applied this model of growth most literally. For example, the former Soviet Union invested heavily in both physical and human capital, and their educated workforce engaged in a policy, directed by central planning, of incorporating technological advances into their production processes. Yet, despite their investments to increase K and L, and their policy of trying to shift production from Q=f(K,L) to Q=g(K,L), the Soviet Union collapsed as a result of its economic failures.

This central economic planning found support not only from communist governments, but by the leading architects of twentieth century economic theory as well. Taking this framework for economic growth very literally, Samuelson (1973: 883), in his best-selling introductory textbook, estimated that the Soviet Union's per capita income was about half of per capita income in the United States; yet because of its superior economic system he argued that the Soviet Union's economic growth rate was greater, and projected that it would catch up to the United States in per capita income perhaps as early as 1990, and almost surely by 2010. Historical events have shown that the theory underlying Samuelson's forecast is somehow flawed or incomplete, yet that same foundation remains in neoclassical growth theory in the twenty-first century.

One problem with this framework was noted earlier. When analyzing the substantial increase in economic well-being that people in market economies have enjoyed over time, the major component in that increase is the new goods and services that people have to consume. While it is true that if one just reduces all of the heterogeneous production of the economy into a homogeneous measure, Q, measured Q has increased substantially, this method of analysis leaves out the fact that as aggregate income has grown, the components that make it up change over time. The method of aggregation in growth theory depicts the process as growth in a

homogeneous measure of income without recognizing that this growth embodies in it progress represented by changes in the components.

This is a fundamental shortcoming of the theory, not a mere detail, because it is the change in the components that cause the increase in aggregate income, and in a framework that does not incorporate the change in the components, the fundamental cause of growth is assumed away. If the model assumes away the fundamental cause of growth, it cannot explain what it has assumed away. For growth theory to accurately depict the nature of economic growth, it would have to account for economic innovation and changes in the composition of output, not just depict growth as increases in Q.

As impressive as it is that general equilibrium macro models can be calibrated to accurately describe the movements of economic variables, this is precisely what Ptolemy did in his model of the universe, about 150 A.D., which depicted the universe with the Earth in the center and the heavenly bodies moving around it on concentric spheres. Ptolemy's model of the universe held up well (and is still the basis on which planetariums are designed) until challenged by Copernicus in the 1500s. The Ptolmeic model of the universe shows that a model can be completely inaccurate in its depiction of actual underlying phenomena and yet still be very accurate in replicating real-world movements in data. If the engine of economic progress is the new goods and production methods that are completely left out of a growth model that just shows growth as increases in aggregate output, one might question whether such growth theories really are descriptive of the underlying processes that cause growth, even if they are able to closely replicate movements in macroeconomic data.

Over the twentieth century per capita income in the United States increased by about seven times. While people on average consumed more calories at the end of the century than at the beginning, they did not consume seven times as much food. Similarly, transportation technology at the beginning of the twentieth century still relied heavily on horse-drawn wagons, or at the high-tech end of things, on steam engines pulling trains. At the end of the twentieth century people did not demand seven times as many horses, or seven times as many train rides. They

would not have had the time to consume that much transportation, and in fact the demand for horse-drawn carriages and train rides fell as people crossed the country – and the oceans – in aluminum cylinders that traveled 550 miles an hour six miles above the surface of the Earth. They lived in air-conditioned homes with microwave ovens and computers connected to the internet, consuming goods that had not even been imagined a century before.

Income could not have grown as much as it did in the twentieth century if the characteristics of output had not changed. People did not work so they could buy more of the same goods, but because new and improved goods were available to them. Had the characteristics of output remained the same, total output would not have expanded as much as it did. Progress is the engine of economic growth and the economy grew because progress created improved output – as judged by the demands of those who consumed it. Income growth cannot be understood without incorporating the forces that led to innovations in the types of goods and services that people consume.

This type of innovation creates what Schumpeter (1950: 81) referred to as creative destruction. If one envisions an economy prior to an innovation as in a competitive equilibrium, the disturbance caused by the innovation causes some activities that were previously profitable to become unprofitable, as people migrate from old products and markets to new ones. That creative destruction is welfare-enhancing and produces economic progress. If the creative destruction disturbs the existing way of doing things, it may be a move away from an existing Pareto optimum, further suggesting the problems with using Pareto optimality as a benchmark for welfare maximization.[4] Movements away from Pareto optimality caused by innovative creative destruction are welfare-enhancing, in contrast with neoclassical welfare economics. The conjecture in this paragraph is built entirely within the framework of neoclassical welfare economics, using Pareto optimality as a benchmark, and this benchmark has already been questioned because it is unobservable and irrelevant to actual welfare maximization. The point here is that not only is it irrelevant, but when economic progress is seen as the cause of

improvements in welfare, sometimes movements away from Pareto optimality are welfare-enhancing.

When looking at improvements in people's welfare, increases in income improve economic well-being, so income growth is welfare-enhancing. People's welfare also increases because they can consume new goods that were not available in the past. The potential for income growth is limited in the absence of innovation in the goods and services that can be bought with increases in income. Therefore, the foundations of welfare economics must be based on those factors which generate the economic progress that produces the increased welfare, not just factors which cause incomes to rise. Entrepreneurship, not income growth, is the key to increasing welfare. Income growth is only one facet of the economic progress that increases welfare.

Theoretical Foundations of Welfare Economics

While welfare economics traces its (modern) origins back to Pigou (1962 [1920]), Schumpeter's (1937) *Theory of Economic Development* provides a foundation more along the lines of identifying the actual causes of improvements in economic welfare. Schumpeter distinguishes invention from innovation, noting that innovation means bringing new products and production processes to market, leading not just to growth, but to progress. Very likely, Pigou's ideas evolved into the still-current neoclassical welfare economics of the 1950s not because neoclassical welfare economics contained more insight than Schumpeter's approach, but rather because it could be directly built upon the mainstream general equilibrium framework popularized by Hicks (1939) and Samuelson (1947), which was on the cutting edge of economic theory.

The welfare economics of the 1950s developed the way it did because it was using the increasingly mathematical tools of neoclassical economics. To quote an old saying, "When the only tool you have is a hammer, everything looks like a nail." The hammer of the neoclassical framework built a welfare economics that defined a welfare maximum as a static Pareto optimum. Meanwhile, Schumpeter's framework was not so amenable to mathematical rigor, and suggested

an indeterminacy in economic outcomes that was not so readily compatible with the more rigorous general equilibrium approach.

A look out the window at the real-world economy suggests that it is better described by an evolutionary approach than an equilibrium framework, and while authors such as Alchian (1950), Nelson and Winter (1982), and Beinhocker (2006) have made some contributions toward an evolutionary framework for economics, their insights have not been applied to welfare economics, at least directly. One major difference between an evolutionary framework and an equilibrium framework is that while an evolutionary system continues evolving, it does so in a path-dependent way and is not headed toward some deterministic outcome. Entrepreneurial decisions made today can change the future trajectory of the economy, in contrast to an equilibrium framework where regardless of what people decide today, market forces always pull the economy back to equilibrium. In an evolutionary setting, there can be no benchmark, like Pareto optimality in the neoclassical framework, that indicates whether welfare is maximized.

Profits and Welfare Maximization

In neoclassical welfare economics, profit (beyond a normal profit) is inconsistent with welfare maximization. Profit is an indication of either monopoly, which is inefficient because too little of the monopolized output is produced, or of disequilibrium, which also results in an inefficient allocation of resources. In the competitive general equilibrium, following Arrow and Debreu (1954), that is the benchmark for welfare maximization, profits are zero, and following Bator (1958), at least one type of profit (monopoly profit) is an indicator of market failure – that is, a failure to reach a welfare-maximizing Pareto optimum. In the neoclassical framework, profit is inconsistent with welfare maximization.

When one views welfare maximization as a process that generates economic progress, profits are necessary for welfare maximization. Welfare is improved through economic progress, as entrepreneurs discover more efficient methods of production, and new and improved goods and services that can be produced for consumers. Profit both provides an incentive for

entrepreneurs to engage in this function, and provides an indicator of the success of the entrepreneurial activity.

Entrepreneurs necessarily face uncertainty when they introduce innovations into an economy. Changes in production methods do not always work as foreseen, and there is no way to look at economic data to tell whether innovations that are brought to market will prove profitable. Profits are revenues minus costs, and because the new product has never been on the market, one can only speculate on the demand for it. Entrepreneurs undertake these uncertain ventures because if their judgment is correct, they will profit. Profit serves the dual role of giving entrepreneurs an incentive to take a risk and introduce an innovation into the economy, and as an indicator of whether, after the fact, the innovation was welfare-enhancing. A profitable innovation indicates welfare has been enhanced, because purchasers are willing to pay more for the output than it costs to produce. A loss indicates that welfare has been diminished, and that the entrepreneur should change course. Innovations are initiated in response to the lure of profits. As Schumpeter (1934: 154) said, “Without development there is no profit, without profit no development.”

When one views welfare maximization as a process that generates economic progress, profits are necessary for welfare maximization; yet, in neoclassical welfare economics profits are inconsistent with welfare maximization. This, by itself, illustrates why a Pareto optimal allocation of resources inhibits welfare maximization and is inconsistent with welfare maximization.

Welfare and Public Policy

A reexamination of the foundations of welfare economics might be interesting purely on theoretical grounds, but would be much more valuable if it brought with it policy implications, and it does. Welfare is enhanced through economic progress, and economic progress is generated through entrepreneurship. Profits serve both as the incentive for entrepreneurial activity and as an indicator that innovation has actually been welfare-enhancing. If innovators can combine resources in such a way that the cost of production is less than the revenue from selling what is

produced, resource allocation is improved, based on the values buyers and sellers place on the resources and products that are marketed. This economic activity takes place through voluntary exchange, which public policy should protect and encourage.

In keeping with the process-oriented nature of welfare economics, welfare-maximizing policies are those that create an environment in which entrepreneurship and innovation are most likely to flourish. A growing literature is identifying and empirically verifying the characteristics of this environment. A good taxonomy – and a good data source – is found in Gwartney and Lawson (2007). The literature using their index empirically supports the conclusion that protection of property rights, freedom of exchange, rule of law, low taxes and regulatory barriers, limited government, and access to sound money, are the key features that lead to economic progress. A reformulation of the foundations of welfare economics would place the foundation of economic welfare on the degree to which the institutional structure fosters entrepreneurship and economic progress.

Welfare itself is not a single-dimensioned outcome, and there is no reason not to look at indicators such as per capita income, life expectancy, capabilities and inequality (Sen 1992), or even measures of happiness (Frey and Stutzer 2001), because those are the things economic actors are striving for as they make choices throughout their lives. However, welfare economics as defined by Pigou focuses on people's material well-being, and people's material well-being is maximized through economic progress. Because progress is an ongoing process, not an outcome, the focus of a reformulated welfare economics naturally turns to those economic institutions that are most conducive to the generation of progress.

Conclusion

Because welfare maximization is a process, not an outcome, welfare is never "maximized," if that means arriving at a welfare maximum. A process-oriented approach to welfare maximization more accurately describes real-world increases in welfare than the outcome-based neoclassical depiction of welfare maximization. One would be hard-pressed to describe the huge increase in

economic welfare over the past century as a consequence of moving toward Pareto optimality, following neoclassical welfare economics. Rather, it is a result of the process of economic progress, consistent with a process-oriented approach to welfare economics.

If we date the beginning of modern welfare economics to the publication of the first edition of Pigou's book in 1920, welfare economics is now nearly 90 years old, and it is unrealistic to think that one short paper can replace a research program that has been going on that long. This paper has the more modest ambition of pointing out the fundamental – and fatal – flaws in the foundations of neoclassical welfare economics. If economists will step back just far enough to admit that welfare is not maximized by allocating resources Pareto optimally, and that in important ways a Pareto optimal allocation is actually inconsistent with welfare maximization, economics can move away from what obviously is a flawed foundation for welfare economics. The very limited goal of this paper is to try to get economists to recognize that welfare is maximized through economic progress, not through a Pareto optimal allocation of resources.

If Pareto optimality is abandoned as a benchmark for welfare maximization, what would replace it? Much of the paper is oriented toward showing that there is a coherent way to think about welfare maximization as a process, and that this line of reasoning points toward a reformulation of the foundations of welfare economics. However, at this point, neoclassical welfare economics is so firmly entrenched in the discipline it would be a large step simply to recognize the fatal flaws in neoclassical welfare economics and consider the suggestions here as demonstrating that there is an alternative. One reason for mentioning policy implications in one of the sections above is to illustrate that the implications go well beyond economic theory, and are important for people's real-world economic welfare. Economic progress is what improves economic welfare, so any reformulation of welfare economics should start from that clearly-observable fact.

Footnotes

[1] It may be possible to further increase social welfare if redistribution would lower the utility of those from whom resources were transferred less than it would add to the utility of the recipients of those resources, following Samuelson (1956).

[2] For example, supermarkets replaced corner grocery stores because the development of the automobile allowed supermarkets to attract customers from a wider area who were able to buy more each time they shopped because they could carry their purchases in their cars. The development of the automobile led to the development of the supermarket, giving shoppers a greater variety of choices at lower cost.

[3] This is the idea behind revealed preference, and the idea behind what Rothbard (1956) calls demonstrated preference. Rothbard (1956) should be acknowledged because the title of this paper is similar to his title. While there is some similarity in the ideas also, criticisms of Rothbard by Cordato (1992), Prychitko (1993), and Caplan (1999) are well-taken.

[4] Within a general equilibrium framework, if the economy is in equilibrium and then a Schumpeterian entrepreneur disturbs that equilibrium, producing creative destruction, the economy moves from a Pareto optimum away to a situation that is not Pareto optimal, which generates economic progress and is welfare-enhancing. The caveat here is that the economy may not be resting at a Pareto optimum, so one cannot know whether the change moves away from Pareto optimality. Because Pareto optimality is non-observable, one can never, in fact, say that an actual economy is moving closer, or further from, a Pareto optimum.

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