Stable jobs or iPhones?
The Dilemma of Innovation in Socialism

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Introduction: The Importance of Innovation

The debate between capitalism and socialism is usually framed in terms of static efficiency. This approach asks which system can make better use of a given set of resources under given conditions.[1] However, it is doubtful that either system is inherently more "efficient" than the other. The famous economic calculation debate, at its height in the 1920s and 1930s, focused on precisely such notions of static efficiency, and ended with Oskar Lange showing that socialism can reach any equilibrium that capitalism can reach (Lange, 1938). Much earlier, before the debate as such had even begun, Enrico Barone used a model of static equilibrium to argue that, *ceteris paribus,* a socialist state must organize its planned economy in the same way as in a perfectly competitive market economy, except perhaps with a different distribution of income. In other words, the only difference between perfectly efficient socialism and perfectly efficient capitalism is that the former has a more egalitarian distribution of income than the latter. (Barone, 1935)

While analyses and comparisons of socialism and capitalism have continued to focus on this static approach, in our view the ability of each system to improve economic performance over time is the most important dimension to analyze, and technological change is the basis for long-run improvements in economic performance. The ability of capitalism to promote technological innovation is a major reason for its historical success. European empires in the 19th and 20th centuries were able to extend capitalism throughout the world largely due to their technological edge. Closer to our time, the bewildering array of consumer products available under capitalism remains one of the main reasons why this economic system is attractive to large numbers of people. The lack of consumer goods on a par with the West was one of the most important causes of popular discontent with Soviet-type socialism.

Any socialist system that arises in the future is likely to exist alongside capitalist societies in the world, for some time. They would undoubtedly become rivals, and in order for socialism to be successful, it must be able to withstand a long-lasting rivalry with capitalism. Innovation will play a crucial role in any such rivalry, in at least two ways that we will consider in this

[1] The meaning of "better use" is open to interpretation, which often ends up being the most contentious part of the debate.

paper. First, the popularity of each economic system will be affected by its ability to provide attractive consumer goods. This may not be the leading factor in people's decisions about which system to support, but it will certainly be a factor. Second, any international rivalry between capitalism and socialism will necessarily involve a military component. The society with the more technologically advanced military will have an advantage, even if no war actually takes place.[2]

To address this question, we begin with a brief discussion of innovation under capitalism and Soviet-type socialism as background for considering how the above challenge to a future socialism might emerge and how it might be resolved.

Innovation under Capitalism

The rapid advance of technology in capitalist societies over the course of the 19th and 20th centuries is well documented. Indeed, the critics of capitalism spoke very favorably of its promotion of technological progress as early as the mid-19th century (Marx and Engels, 1978).

How does capitalism promote innovation? The key ingredient is said to be competition. Private firms aim to maximize their profits, and so they pursue innovation in order to increase their profits and stay ahead of their competitors. For example, a firm that introduces a successful process innovation is able to produce its output at a lower cost and thereby undercut the competition. A firm that introduces a successful product innovation is able to entice buyers away from the competition. Potential investors are aware of these benefits and provide financing for innovations in the hope of future returns. Some risk is involved, as not all research leads to innovations and not all innovations prove to be commercially successful, but investors can hedge against these risks by maintaining a sufficiently diverse portfolio. Finally, under perfect competition, the lack of barriers to entry ensures that new firms can enter any market where there is potential profit to be made by introducing an innovation. The same condition ensures the rapid diffusion of successful innovations, as other firms will see and copy the successful idea.

One major problem with this picture is immediately apparent. In a competitive market with no barriers to entry, an innovating firm can only profit from its innovation for a very short time before competitors move in and copy its successful idea, driving profits back down. And if profits from a new innovation are too small, or too short-lived, then the original innovating firm

[2]Successful Innovation can be expected to be advantageous for other reasons as well in such a future rivalry, including their role in raising the productivity of labor and living standards.

will not even be able to recover the funds spent on research and development. As a result, paradoxically, *too much* competition can reduce or even eliminate the incentive for innovation, by rendering it unprofitable. The precise aspect of capitalism touted as its greatest virtue becomes a vice.

To address this problem, governments in capitalist societies have universally decided to restrict competition by issuing patents and copyrights, thus effectively granting each innovating firm a monopoly over its innovation for a set period of time. This means that firms can look forward to *monopoly profits* from most types of innovations, which provides a greater incentive to innovate. Indeed, the political arguments in favor of patents and copyrights are always based on the idea that such laws are necessary to promote innovation, while copying an innovation is seen as a form of theft that deprives the innovator of the profits derived from the effort or insight of the initial innovator.

However, this means that diffusion (copying) of innovations is deliberately restricted, in order to create the necessary incentive for firms to engage in the other steps of the innovation process. An adequate incentive to innovate comes precisely from the guarantee that other firms will not be legally allowed to imitate the innovation, at least for some time. Thus, capitalism imposes a tradeoff between the incentive to innovate and the speed of diffusion of new innovations as well as gaining the maximum possible benefit from the innovation.

Notwithstanding the issues discussed above, the fact remains that capitalism produces a great number of innovations and has been able to do so over a long period of time. Critics can point out that they are not diffused as rapidly as they should be, and that the benefits are not spread as widely as they should be, and that the monopoly profits acquired by innovating firms are too great and lead to unnecessary inequalities. Also, the role of the state and private non-profit institutions is so important in innovation that the unique features of capitalism are only partly responsible for the innovations that occur under this economic system. Nevertheless, the record of capitalist innovation is impressive.

The strength of the incentive to innovate under capitalism is actually rooted in the inefficiency of that process. That is, the decision to innovate in capitalism does not take the social costs into account. Every time a new innovation is introduced, there are winners and losers. Even in the most basic scenario where only a new consumer product is introduced, while there are winners -- the consumers –there are also losers, which includes the workers making the

old products which were replaced by the new one as well as additional workers who make inputs used to produce the old products.[3] Thus, for each innovation, it is worth asking if the benefit is greater than the harm and if gains and losses are equitably distributed.

Some innovations have significant positive externalities, such as product innovations that are public goods and process innovations that benefit the community around the firm which adopts them. Capitalism is very likely to neglect such innovations, and capitalist firms are likely to ignore avenues of research that may result in them. This is not a trivial matter affecting only a few select public goods. The entire technological trajectory of a society is affected if it focuses almost exclusively on innovations that are intended to lead to profitable private goods. Of course, we cannot know what innovations *would have been made* if we had different economic institutions, but the point is that the cost-benefit calculation under capitalism takes account only of private costs and benefits to the innovating firm. This can lead to some innovations being produced and disseminated even though they are a net loss to society. Or, conversely, it can lead to some innovations not being pursued because they are not profitable although they would have considerable net social benefit.

Innovation under Socialism

The socialism to be discussed in this paper is based on a planned economy with social ownership of productive property.[4] This definition is broad enough to include a wide variety of different socialist economic systems, from the authoritarian Soviet model to various kinds of democratically-planned socialist models.[5]

Soviet-type Socialism and Innovation

The Soviet model of socialism was presented by its advocates as a technologically progressive economy, and there was some merit in this view. The Soviet model certainly achieved rapid industrialization and sustained high levels of economic growth for several decades, which included the development and dissemination of new technologies. The Soviet Union pioneered space exploration and was a world leader in theoretical sciences. It developed advanced military technology and also civilian technology in a number of fields. Soviet eye

[3] Existing fixed capital used to produce the old products is devalued as well.

[4] Social ownership can include ownership by national, regional, or local government, or by workers or consumers. It excludes ownership by private investors seeking profit from the enterprise.

[5] We exclude a form of socialism based on market allocation rather than economic planning, based on our view that such system cannot provide a stable alternative to capitalism.

surgery equipment and seamless rail laying machines, for example, were among the best in the world by the 1970s (Berliner, 1976). Labor productivity also grew rapidly until 1975 (Kotz and Weir, 2007).

Several arguments were made in favor of the potential of the Soviet model for innovation. It was argued that the Soviet model could innovate more efficiently and disseminate innovations more rapidly than capitalism, because there were no private firms with a desire to maintain trade secrets, no patent laws, and no wasteful competition as in capitalism. In addition, the Soviet system encouraged scientific education, provided ample funding for basic research, and had a variety of institutions with an explicit mandate to produce innovations. The profit motive was absent, but in its place the central plan directly encouraged innovation by such methods as raising enterprise labor productivity targets each year. There were well-funded professional innovators in large enterprises and in specialized R&D institutes. The Soviet state also made some efforts to encourage amateur innovators.

Yet for all that, and in spite of the very real successes of Soviet innovation in some areas, the system had major flaws pulling it in a technologically conservative direction and ultimately preventing it from outpacing capitalism in the invention and application of new technologies. These flaws were first of all present in the incentives faced by enterprise directors. The primary goal they were given was to fulfill the production targets in the current economic plan, and their monetary incentives were largely focused on this. As a result, small process innovations that had obvious benefits were adopted quite readily in order to increase productivity, but enterprise directors saw more significant innovations as simply too risky to adopt in most cases. The incentives called for continuing with tried-and-true methods that guaranteed fulfillment of the plan, rather than risking doing something new that may or may not work as intended. This was especially true given the policy of "taut planning," which aimed to provide each enterprise with precisely the inputs it appeared to require to reach its output target, and no more than that. This meant that any delay or minor error could cause an enterprise to miss its plan targets, and most directors were not keen to increase their risk by introducing innovations.

The Soviet system did not suffer from the capitalist bias towards private goods in the innovation process. For example, it developed an excellent public transport network, both within cities and throughout the country. However, the Soviet system did suffer from a bias in favor of what might be called "prestige goods". Throughout its existence, but especially during the Cold

War, the USSR repeatedly attempted to demonstrate its superiority over its capitalist rivals by investing heavily in projects that were designed to be more eye-catching than useful, and also by focusing excessively on military spending and military technologies. This is sometimes called the problem of "planners' preferences", but it should be noted that Soviet economic planners, despite their considerable power and lack of popular oversight, did not generally allocate extensive resources for their own private consumption. Rather, they allocated extensive resources to boost national prestige.

Democratically Planned Socialism and Innovation

There have been several different proposed models for a democratically planned socialist economy, including the system of negotiated coordination put forward by Devine (1988), the participatory economics envisioned by Albert and Hahnel(1991), and the computerized "new socialism" of Cockshott and Cottrell (1993). They differ in important respects, but they all share similar criticisms of the Soviet system and propose a type of socialism that is more democratic, both at the national political level and also within the workplace. This has important consequences for innovation.

First, merely having an open and democratic society, with elected representatives answerable to a voting public, would go a long way towards fixing some of the shortcomings of the Soviet model. Such a society would not invest in useless "prestige goods" that do not improve anyone's welfare, and, assuming that voters are concerned about their own future and that of their children, steps would be taken to develop environmentally-friendly technologies and innovations that make use of renewable energy sources.

If innovation is to be encouraged, taut planning would have to be abandoned, and enterprises should not be discouraged from taking risks. The incentive structure should be less focused on penalties for failure and provide more rewards for unexpected success, compared to the Soviet model. Communication should be encouraged between enterprises and their suppliers, and in fact it would be entirely feasible and desirable to make all economic information publicly available. This contrasts with the Soviet model, which operated under a siege mentality and placed a high emphasis on secrecy.

At the same time, the benefits of the Soviet model could be maintained: high investment in basic science, public goods being given adequate importance, and the free circulation of technical knowledge without legal barriers imposed by patents or copyrights.

A democratically planned socialist economy would not suffer from the shortcomings of innovation under capitalism. The direction of research and investment in the pursuit of innovations in various fields could become matters of public debate. It could be democratically decided, for example, whether to invest in the pursuit of more efficient electric cars or modernize the rail network instead. Thus, public and private goods could be placed on a level playing field. Innovations that are socially harmful could simply be abandoned or not pursued in the first place, even when they are such that a private firm could have gained an advantage in the marketplace by being the first to adopt them.

The Dilemma of Innovation in Socialism[6]

One of the advantages of the model of innovation in DPPS is that it can take into account social and environmental costs, including the jobs lost or disrupted by the introduction of a new technology. But this can also be problematic, in that it is likely to make innovation slower in socialism than in capitalism. Democratic majorities are not immune to the same factors that caused Soviet managers to be technologically conservative.

On the one hand, DPPS will not suffer from the obsession with secrecy that plagued Soviet-type socialism, so the dissemination stage of the innovation process should be quite rapid, and faster than in capitalism. Also, DPPS would not suffer from taut planning, unrealistic plan targets imposed from the top down, or an incentive structure that discourages risk-taking by trying out new technologies.

But on the other hand, innovation is always disruptive in any kind of economic system. As old technologies are superseded, product lines become obsolete, production processes are changed, and certain kinds of jobs are no longer needed. Thus, technological progress leads to insecurity about the future of one's job. Even with an employment guarantee, the loss of one's job may have to involve retraining, changing careers, or moving across the country. So it is reasonable to expect that workers will resist new technologies. Yet at the same time, in their capacity as consumers, they will demand new and better products.

[6] The dilemma of innovation in socialism, and the possible responses to it, considered in this section apply specifically to a period in which socialist and capitalist systems coexist in the world. If socialism largely or entirely replaces capitalism in the world, and hence is no longer engaged in a rivalry with capitalism on a world scale, this dilemma would likely have different features and different possible resolutions.

This is the “Stable jobs or iPhones?” dilemma. We can have cutting-edge consumer products, or we can have stable employment, but perhaps not both. In DPPS, the people will be able to decide between one and the other, on a case-by-case basis, so that some innovations will be pursued, others will be scrapped because of their disruptive effects, and some will be introduced at a deliberately slow pace.

Meanwhile, capitalism always comes down in favor of the iPhones despite the conflict with stable jobs. Since socialism will not always do this, it is likely that socialism will have more job security but fewer cutting-edge consumer products than capitalism.

If there is an international rivalry between socialism and capitalism, the citizens of the two kinds of societies will be able to compare their lifestyles with those in the other economic system. Workers living under capitalism may be attracted by the stable jobs, shorter working hours, democratic workplaces, and social benefits (such as universal healthcare and education) provided by socialism. However, those living under socialism will likely also be attracted by the superior consumer goods available under capitalism. Moreover, as long as the speed of innovation in socialism is lower than that in capitalism, the “consumer gap” with capitalism would grow over time.

This may not be considered a problem for socialism if people value stable jobs more than iPhones, but not everyone does. In our scenario, we are assuming that the majority of people living in socialism value stable jobs more – because that is the reason for the consumer gap in the first place – but there would likely be a minority who disagree. If the consumer gap is large enough, and/or that dissenting minority has such an overriding preference for consumer goods that it outweighs any other benefits they might receive from socialism, then we have a category of people with a material interest in supporting capitalism, even though they are part of the working class.

That some workers in a socialist society might prefer capitalism because of better consumer goods is not a novel observation –this exact phenomenon played a role in the demise of the Soviet system. However, it is a problem that has not been sufficiently studied by advocates of socialism. The most common response to the flaws of Soviet socialism has been to propose other models of socialism that would not have those flaws. But the tradeoff between job security and innovation doesn't appear to be one that can be easily eliminated within socialism. It is not due to the overly centralized or undemocratic nature of Soviet socialism.

Furthermore, there is a military aspect to the innovation problem, which did not affect Soviet socialism because Soviet planners always placed a strong emphasis on military technology and development. However, the military aspect of the problem may affect DPPS. Innovations that aid the military but have no effect on the welfare of ordinary people are also likely to have a disruptive effect on employment, as in the case of consumer-oriented innovations. If tanks become obsolete and are to be replaced by a better technology, then tank factories might have to be closed, and the lives of the people working there would be disrupted. This might face democratic popular opposition, especially since, in this case, the job disruption doesn't even bring any improvement in living standards.

This is a problem because it might put DPPS at a military disadvantage with respect to capitalism, which would hurt the socialist side in international relations even if no military conflict takes place. Suppose we have a situation of international rivalry between two sides. If one side knows it *would* lose any war that *did* take place, then that side will act timidly and avoid even non-violent confrontation, so as to avoid provoking the other side into war. Thus, it would be difficult for the socialist side to prevail in a long-term rivalry, even if it is a peaceful one. For both sides to stand a good chance of success in a peaceful rivalry, they must be more or less evenly matched militarily, in the sense that it must be open to debate which side would win in case of a war, so that neither feels that it can do whatever it wants with impunity or that it must tread lightly to avoid confrontation.

The Cold War was a multi-faceted struggle between two different systems. Any future socialist economic order will most likely have to face capitalism in a somewhat similar struggle. Can such a struggle be won by socialism without matching capitalism's rate of technological development? That is the question.

Possible Solutions

One possible response is to accept this as on balance a positive feature of socialism, even if it does come with certain disadvantages. If the rate of innovation has been slowed down by democratic decisions, some may ask, "What is the problem? The people have decided that it is better to advance slower, and that is a valid choice." It may be a valid choice, and it may even be one of the best features of socialism that it does not force people to constantly switch jobs and uproot their lives. In contemporary capitalism, "flexibility" has become a byword for

"insecurity." Many people would appreciate less "flexibility" in their careers and work schedules.

However, if this choice caused the socialist society to lag behind rival capitalist societies in technological development, that would be dangerous for the long-term survival of socialism, as noted above. Under certain favorable circumstances, perhaps this problem could be ignored. For example, if socialism first takes hold in the most technologically advanced countries, the faster rate of innovation under capitalism would help the less developed capitalist societies to catch up over time, and, as we've seen from the Cold War of the 20th century, it is entirely possible for the society that is catching up to lose the race to the one that began with a sufficiently large head start. In other words, there might be no problem if orthodox Marxism ends up being right in the next round of transition to socialism about where it is likely to begin.

Is there a way to overcome this problem entirely, by eliminating the tradeoff between job stability and technological innovation? In our view, in principle there is. It is possible to imagine a scenario in which the forces of production under capitalism have advanced to the point where it would be technologically possible to automate all jobs. We do not believe that capitalism would make full use of this automation potential, because if rapid automation produced a swelling reserve army of labor, the result would be to drive down wages, making human labor cheap enough that it would be profitable to employ it again. However, capitalism could give us the technology needed for full automation, even if the capitalists do not use it. In such a scenario, then, a transition to socialism could mean a transition to full automation. The new socialist society could make use of the technological potential and automate all jobs. In that case, further innovation would not disrupt anyone's job, because there would be no jobs to be disrupted. Human labor would have become, for the most part, a purely voluntary activity done for the purpose of self-actualization, rather than something needed for production and a source of income for the workers. There is no reason to be concerned about job security if society is organized according to the principle "from each according to their ability, to each according to their need".

Thus, technological progress itself could save us from the downsides of technological progress. We are obviously not at that point yet, but we *could* reach it before the next transition to socialism occurs. Both of the options above are possible, but they essentially rely on luck. There is not much that anyone could do to make them happen. What if the future socialist society

is “unlucky” and has neither a technological head start nor the ability to completely automate all production? In that case, the socialist society would face the tradeoff between job stability and technological innovation, while competing with advanced capitalist societies. This was the situation that all past socialist experiments faced. What is to be done in such a case?

One option would be for socialism to provide a general employment guarantee, without a guarantee of maintaining the same job or even a job in the same enterprise. In other words, socialism would sacrifice job stability, although not security, for the sake of innovation. This is a simple option, viable in all circumstances. Under capitalism such a guarantee would not be possible, at least in the long-run, because workers have too much bargaining power at real full employment for capitalists to extract profit, but it is possible in a socialist planned economy. However, this option would diminish the benefits of socialism over capitalism, by making socialist enterprises behave a bit more like capitalist ones, a decision that may not be popular with the voting public. It could be combined with compensation packages given to workers who are forced to change jobs. Sufficiently large compensation packages might make up for the disruption of involuntarily changing jobs to such an extent that it would be regarded as a net positive by the workers experiencing it. However, that could be quite costly for the rest of society, if innovation frequently renders jobs obsolete.

Another option would be to have “social priority campaigns” in response to challenges from capitalism. If the socialist society finds itself slipping behind technologically in a certain area that is considered particularly important by the voting public, a campaign could be launched to improve that specific type of technology and overhaul the specific industry in question. In other words, job stability could be the general rule, but exceptions could be declared in special circumstances. This could also be combined with compensation packages given to workers who are forced to change jobs, and it would be less costly to provide quite large packages in this scenario since they would be less common.

A third option would be to import an attractive but socially costly new products from the capitalist world for a time while only gradually introducing production of them. After all, consumers only want to get it a new cutting-edge product, not to produce it. This might be a cynical response, since it amounts to unloading the social costs of the new product onto the capitalist world, but it could also be seen as using capitalism against itself. It may not always be a viable option, however. While in some cases greedy capitalists will sell weapons to the

working class for use in the revolution, the capitalist world might impose embargoes on exporting certain goods to the socialist world – especially those with military applications.

A fourth and more far-reaching option would be to develop a two-sector economy under socialism, in which the norm is for everyone to work two half-time jobs rather than a single full-time one. One sector would come with a lifetime job guarantee and would involve craft-type production and other types of production that are satisfying for the workers. The other sector would be guided by the aim of producing goods in an efficient manner and would not protect jobs from the disruptive effects of innovation. The economy could be organized such that a worker spends half of the working week in a sector 1 job and the other half in a sector 2 job. Many people may want the two jobs to be relatively similar and even in the same enterprise, and fulfilling that desire could be a goal of the planning system although not one that could always be guaranteed. Sector 1 could potentially produce very high quality products, and it could give workers in each workplace a veto over the introduction of any new technology that would eliminate their jobs. Sector 2 could aim to be at the cutting edge of technological innovation, and the jobs in that sector would only come with a general employment guarantee. Eeveryone would be guaranteed *some* job in sector 2, but it would not necessarily a be stable or enjoyable one.[7]

There may be other options for resolving this contradiction of socialism. Several options might be combined. It is possible that different socialist societies will handle this dilemma differently. It is also possible to imagine a socialist city-state full of enterprising people who enjoy changing jobs on a regular basis, for whom the social costs of innovation are not regarded as costs at all. The important thing is to acknowledge that this problem exists. It is a problem that advocates of socialism must confront.

[7] Such a two-sector production model would pose a challenge for economic planning. To be workable, the sector guaranteeing stable employment would have to be able to produce products that consumers want to purchase. If the other sector became able to produce all of the goods needed for a comfortable living standard with only a half-week of labor per worker, the guaranteed stable employment sector might evolve into a sort of hobby sector whose products would be partly sold as luxuries and partly distributed free of charge.

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