

Whither Greenwald-Stiglitz?

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Among the hundreds of papers Joe has written on information economics, the one with Greenwald (1986) surely ranks near the top. It establishes a conceptual parallel between asymmetric information and technological externalities, and shows that a competitive equilibrium of an economy with asymmetric information is generically not even constrained Pareto efficient. A government facing the same information constraints as the private individuals in the economy can nevertheless find Pareto-improving policy interventions. Joe himself makes numerous references to it in his subsequent writings, for example the book “Whither Socialism,” based on his Wicksell Lectures (Stiglitz 1994). However, it is fair to say that the result is used mostly as a critique of conventional economic thinking and advocacy of decentralization and privatization, and for some general remarks about the kinds of policies that may be of use. If it is to have value beyond its use for critics of markets of all stripes to hijack and invoke in support of their own agendas, it should lead to explicit construction of good policies in specific practical contexts of asymmetric information. In my judgment this largely remains an open question for future research.

This assertion may come as a surprise to you. Greenwald and Stiglitz in their original article develop a general formula, and several applications of it as examples of Pareto improving policies. There is a large literature that followed up these ideas. However, I think that these calculations and examples fall short of usefulness in two important respects.

First, all the models depict an economy in which the information asymmetry is the only distortion, and introduce a small dose of a policy instrument. If this has any effect on the margin of distortion, for example if it relaxes an incentive compatibility constraint or increases an agent’s incentive to supply unobservable effort, that by itself is a first-order welfare-improvement. The instrument will generally have its own distorting effect, for example it may be a subsidy whose financing creates some dead-weight burden. But since the economy has no other distortions and the instrument is being introduced starting

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at a zero level, this distortion is the usual triangle of the second order of smallness. Therefore the small dose of the instrument creates a net benefit. The problem is that in reality we never find an economy that is pristine except for the one problem in which we are interested. There are other pre-existing margins of distortion. The selected instrument, for example an income tax or a commodity tax or subsidy, may itself start at a positive level. Even if it starts at a zero level, it will generally affect many of the other distorted margins. Therefore the by-product marginal welfare effects of the instrument will be several of the usual trapezoids of the first order of smallness, comparable with its effect on the margin that is the focus of interest. The net effect is not easy to predict. It will generally remain non-zero, but in the abstract we cannot say whether it is positive or negative. Therefore we cannot say whether the instrument in question should move in the one direction or its opposite, for example whether we should subsidize or tax the commodity. That requires a much more detailed calculation of all the first-order effects and of their net balance.

Second, many instruments have some effect on the margin of distortion, and are therefore candidates for the policy role. Which one, or what mixture, should be chosen? Obviously the best one, that is, the one that gives the most welfare improvement subject to the constraints of the problem. But the Greenwald-Stiglitz theorem by itself does not tell us the optimal policy; it merely says that there is a beneficial policy.

The first of these two problems is shared by almost all of normative economics. But analyses of policy design in other fields have made more progress on the second. In fact, I expect that scholars of international trade have a feeling of *déjà vu* about the need to find the best policy to counter the distortions or constraints that I emphasized above. In the 1950s and 60s, a lively debate occurred on the role of international trade policies for countering domestic distortions. The work of Bhagwati, Ramaswami, Srinivasan, and Johnson, beautifully surveyed by Bhagwati (1971), culminated in the following set of propositions. First, starting from a laissez-faire equilibrium that is inefficient because of a distortion in domestic production, a small trade tax (or subsidy, whichever moves the distorted margin in the right direction) yields a first-order welfare improvement at a second-order cost of the by-product distortion created by the instrument itself. Second, the trade policy should be used at a level that stops short of curing the domestic distortion

completely, because its last dose yields only a second-order benefit at first-order by-product cost. Third, an instrument that tackles the distortion directly, for example a production subsidy if a positive externality is keeping production suboptimally low in some sector, is superior; the trade intervention can at most be only a second-best policy. The last proposition of sometimes called the Principle of Policy Targeting – match the instrument to the distortion or constraint. In specific contexts, it is often possible to construct a hierarchy of such policies ranked by their relative merit.

The BRSJ analysis does not address the first of my two points either: it assumes that the domestic production distortion is the only one present, and examines policies that will improve upon the laissez-faire equilibrium. But on the question of optimal policy design, this literature has progressed much farther than the corresponding work in information economics following the Greenwald-Stiglitz theorem. And there is a separate strand of research in international trade, identifying quite general sufficient conditions for simultaneous reductions in multiple distortions to be welfare-improving; see a survey in Dixit (1985, section 4). I think that further research in information economics should develop the idea and the technique to a similarly rich level of analysis.

Of the specific applications of Greenwald-Stiglitz that do exist, probably the most noteworthy is the work of Bernanke and Gertler (1990) and their followers. A simple summary is that if wealth constraints prevent a subset of individuals from making productive investments, then a redistributive policy can be Pareto-improving: it mitigates the information problem where the lender infers a borrower's risk from the collateral he offers. This is especially appealing because it is an instance where equity and efficiency go hand in hand instead of presenting an uncomfortable trade-off. Hoff (1996) gives a very nice survey, extension, and interpretation of this literature.

An aside will help improve our understanding of the BRSJ theory and its link to the Greenwald-Stiglitz ideas. An interesting finding of the credit constraint research is that redistribution, even when carried out using distorting taxes and subsidies, can be superior to investment subsidies. At first sight this seems to run counter to the Principle of Targeting. However, the conflict is resolved if we interpret “distortion” correctly. Distortions pertain to margins of choice, not outcomes per se. Although suboptimally low investment is symptom we see in the credit-constrained economy, the cause is the wealth

constraint facing some individuals. The optimally targeted instrument is the one that relaxes this constraint in the most direct way, namely redistribution.

In his very first really big hit, Joe endorsed a criterion of usefulness close to the one I proposed above. Responding to criticisms of the mean-variance approach, Tobin (1969) had argued that the critics " ... owe us more than demonstrations that it rests on restrictive assumptions. They need to show us how a more general and less vulnerable approach will yield the kind of comparative static results that economists are interested in." Rothschild and Stiglitz (1970), "mindful that counsels of perfection are best accompanied by demonstrations of the possibility of attaining virtue," gave an effective demonstration that transformed the economic analysis of behavior under risk. However, I am asking for more than a demonstration of the possibility of improving upon market equilibria. And in support I want to invoke someone with a good claim to be even smarter than Joe, namely Richard Feynman: "I have argued flying saucers with lots of people. ... [T]hey keep arguing that it is possible. And that's true. It is possible. ... [T]he problem is not to demonstrate whether it's possible or not, but whether it's going on or not." (Gleick 1992, 373) I am not saying that normative economics is like flying saucers; it is already far better than that. But I do believe that Feynman's test should apply to serious enterprises of normative economics like Greenwald-Stiglitz. Of course in a normative context the question must be modified from "whether it's going on or not," to "precisely how it should go on." Therefore I am asking for characterizations of *actual* optimal Pareto-improving policies in realistic rather than stylized models of *actual* economies with multiple pre-existing distortions. This is a tough standard, especially when much of other normative analysis has the same shortcomings. But I think it is a fitting challenge and opportunity for the legions of Joe's smart students and followers.

References

- Bernanke, Ben S. and Mark Gertler. 1990. Financial fragility and economic performance. *Quarterly Journal of Economics* 105: 87-114.
- Bhagwati, Jagdish N. 1971. The generalized theory of distortions and welfare. In J. N. Bhagwati et al. (ed.) *Trade, Balance of Payments, and Growth: Essays in Honor of Charles Kindleberger*, Amsterdam: North-Holland.
- Dixit, Avinash. 1985. Tax policy in open economies. In Alan J. Auerbach and Martin S. Feldstein (ed.) *Handbook of Public Economics, Volume I*. Amsterdam: North-Holland.
- Gleick, James. 1992. *Genius: The Life and Science of Richard Feynman*. New York: Pantheon Books.
- Greenwald, Bruce and Joseph E. Stiglitz. 1986. Externalities in economies with imperfect information and incomplete markets. *Quarterly Journal of Economics* 101: 229-264.
- Hoff, Karla. 1996. Market failures and the redistribution of wealth: A perspective from the economics of information. *Politics and Society* 24: 411-432.
- Rothschild, Michael and Joseph E. Stiglitz. 1970. Increasing risk II: Its economic consequences. *Journal of Economic Theory* 3: 66-84.
- Stiglitz, Joseph E. 1994. *Whither Socialism?* Cambridge, MA: MIT Press.
- Tobin, James. 1969. Comment on Borch and Feldstein. *Review of Economic Studies* 36: 13-14.