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Editorial, NBER Macroeconomics Annual 1996

The 1996 edition of the *NBER Macroeconomics Annual* contains six papers on current issues of macroeconomic theory and policy.

The first paper of the volume, by Roland Bénabou, is an overview of an expanding literature that seeks to understand the connections between income (or wealth) inequality and economic growth. An important motivation for this literature is the striking empirical finding, documented and discussed by the author, of a strong negative relationship across countries between the degree of inequality and the rate of long-term economic growth. Another, more technical motivation for the recent work is the increased interest by macroeconomists in formal models in which heterogeneity among agents precludes the use of the "representative agent" construct. In this paper Bénabou looks at models in which utility functions are of the Gorman form, so that, if political-economy considerations were absent and markets were complete, the representative-agent model would be applicable. However, absent these ideal preconditions, evolving heterogeneity among agents plays a key role in determining the growth rate of the economy.

As Bénabou shows, political-economy considerations can lead to a connection between inequality and growth under two sets of circumstances. The first arises when increased inequality of incomes leads the pivotal voter to desire more redistribution, and the political system accommodates this desire through increased taxation of capital income. Under these circumstances, increased inequality can discourage capital accumulation and reduce growth. The second possibility is that increased inequality creates stronger incentives for the poor to attempt to expropriate the rich directly (e.g., through "social conflict"), which induces the rich to hold fewer assets in forms that are expropriable by the poor. Again, capital accumulation and growth suffer as a result. The

latter, conflict-based theory seems more consistent with the facts, as there is little evidence for the prediction of the capital-taxation theory that high rates of redistribution will be associated with low rates of growth. Much of the discussion at the meeting related to the question of why the political-economy model in which voters choose the level of capital taxation does not perform better empirically.

Another reason that inequality might be related to growth is that markets may be incomplete; in particular, because of informational and agency problems in credit markets, people with low levels of wealth may find it difficult to borrow. From a social (as well as private) point of view these credit constraints will be costly, particularly if those denied credit have low levels of physical or human capital and thus high marginal rates of return to investment. In this scenario, redistribution from the rich to the poor, by allowing more productive investments to be made, may raise the social rate of return on capital and the rate of economic growth. This conclusion is consistent with the observed positive correlation between redistribution and growth, although this positive correlation could also be due to "reverse causation" (fast-growing countries find it easier to help the poor). Much of the discussion of this paper focused on how future research should go about developing sharper empirical tests of the various competing hypotheses.

The second paper in the volume, by Matthew Shapiro and David Wilcox, addresses the issue of whether the Consumer Price Index accurately measures the cost of living. As the authors stress, this seemingly technical issue is of great practical importance, for example because of the widespread indexation of tax and transfer payments and because of the close attention paid to inflation statistics by makers of monetary policy. Shapiro and Wilcox begin with a primer on how the CPI is constructed, emphasizing the daunting technical and logistical complexities and the great care taken by the Bureau of Labor Statistics. Despite the efforts by the BLS, however, there remain significant sources of bias in the CPI inflation measure, including substitution effects, imperfect treatment of new items and new outlets, and incomplete adjustment for quality change. The authors illustrate the practical problems involved by constructing a new price index for cataract surgery, showing that standard methods (which focus on the costs of inputs) significantly underestimate the improved quality of service received by cataract patients.

To emphasize the inherent uncertainties in measuring the biases in the CPI, the authors present their estimates for each type of bias in terms of a probability distribution rather than a single number; they also allow for the possibility of correlated errors in estimating biases. They conclude that, with 80% probability, the bias in the CPI-based measure of inflation

lies between 0.6 and 1.5 percentage points per year. They also discuss the possibility that the bias in the CPI inflation measure varies significantly over time.

Much of the discussion of Shapiro and Wilcox's paper emphasized the point that the appropriate method for constructing any index depends vitally on the purpose for which it is intended. For example, social security recipients presumably consume different baskets of goods than working people, which has implications for the choice of index for social security benefits. More generally, depending on one's views about social risk sharing, one might consider novel approaches to indexing retirement benefits, e.g., tying benefits to average nominal wages or consumption.

The third paper, by John Campbell and Robert Shiller, also takes a current policy issue as its subject; namely, whether the U.S. government should issue debt indexed to the price level. Like many economists before them, Campbell and Shiller favor the issuance of indexed debt, primarily on the grounds that it would provide long-term protection from inflation to savers and enhance opportunities for risk sharing. They argue that savers do not now have, and would greatly benefit from, a practical means of locking in long-run real returns. In particular, the authors provide evidence that the strategy of rolling over short-term nominal bills is not a good substitute for holding indexed bonds. The usefulness of indexed bonds as a long-term inflation hedge would depend, however, on the way in which these bonds are taxed; if the principal adjustment of the bond due to inflation is taxed as ordinary income, then the ability of savers to protect themselves from inflation would be much diminished.

Campbell and Shiller also consider the likely effects of issuing indexed bonds on Treasury borrowing costs, although they emphasize that (for Ricardian reasons) these should not be a primary consideration. Using several methods, including a CAPM-type approach, the authors estimate that the inflation premium paid by the Treasury on a five-year nominal bond is in the vicinity of 50 to 100 basis points, a nontrivial amount considering the volume of Treasury debt outstanding. They also consider and dismiss the argument that the issuance of indexed debt would "balkanize" the market for government securities, pointing out that the government already sells a wide variety of debt instruments. Finally, Campbell and Shiller suggest that indexed debt would have other social benefits, including the revelation of information about inflation expectations that might aid the Federal Reserve in its policymaking, and the provision of a "demonstration effect" that would encourage the use of indexed instruments by private-sector borrowers and lenders as well.

The formal commentators and the other conference participants seemed in general to agree with the recommendation that indexed debt be introduced, but some concerns were also raised: These included the possibility that the demand for indexed debt would be low, leading to poor liquidity in the market; that the tax treatment would most likely be such as to reduce the risk-sharing and informational benefits of indexed debt; and that the "demonstration effect" to the private sector would be weak. We may soon learn which if any of these conjectures are correct, as the Treasury has recently announced plans to begin issuing indexed debt.

The fourth paper, by Andreas Hornstein and Per Krusell, focuses on reasons for the post-1973 productivity slowdown. Hornstein and Krusell raise the intriguing possibility that the productivity slowdown is due in part to *improvements* in the quality of capital goods. There are two channels through which higher-quality capital might lead to a temporary reduction in the (measured) rate of growth of productivity: First, increases in the sophistication or flexibility of capital may lead to a short-run decline in final output per unit of input as people must spend time and effort learning how to use the new capital. Discussant Valerie Ramey gave the example of the short-run productivity costs associated with learning a new word-processing program. Second, the availability of better capital may be associated with difficult-to-measure quality improvements in final goods (e.g., a greater variety of fonts in Ramey's word-processed document). One hopeful, if momentarily untestable, implication of this analysis is that productivity growth will eventually recover to its pre-1973 level or higher.

Hornstein and Krusell present a variety of data consistent with their hypothesis. They note, for example, that long-term declines in the relative price of capital goods fit nicely with their view that capital-goods quality is increasing; and they point out that sectors in which quality is hard to measure have assumed increasing importance over time in virtually every industrialized economy. The authors also use calibrated growth models—one model in which new capital is less productive during a learning period, and one in which unmeasured quality is a component of output—to assess the plausibility of their argument. According to the simulations, the unmeasured-quality channel seems to fare somewhat better as an explanation of the productivity slowdown, as learning effects seem to be too transitory to account for the prolonged weakness in productivity growth. Unfortunately, uncertainty about the appropriate values of some parameters in the model prevents clear conclusions.

The discussion raised a number of questions: For example, Ramey focused on whether implications of the theory were borne out for variables not considered in the paper, such as the value of equities. Dis-

cussant Robert Gordon expressed doubts that these effects could explain the productivity slowdown in the nonmanufacturing sector, where the ratio of capital to hours of work may have actually fallen.

The next paper, by Nobu Kiyotaki and Kenneth West, is an empirical examination of business fixed investment in Japan in recent years. Their study is motivated by the leading role played by investment in the Japanese boom and bust of the last decade. They first attempt to explain the behavior of Japanese investment by Tobin's *Q*-theory, using observed stock prices to measure the market value of capital. This approach is unsuccessful, perhaps because of problems in measuring *Q*. Next, they turn to a sophisticated version of the flexible accelerator model of investment, in which capital is assumed to adjust partially toward its desired level in each period, and the desired level of capital depends on the marginal product of capital (proportional to output) and the cost of capital.

The flexible accelerator model seems to work well for Japan. The behavior of investment over the boom period (1986–1991) and the bust period (1991–1994) appears to be well explained and consistent with the estimates for the entire 1961–1994 sample. In particular, the authors show that a substantial portion of the recent fluctuation in investment can be tied to innovations in output and the cost of capital. The discussion praised the careful empirical analysis but also noted two limitations: first, that output and the cost of capital are treated as exogenous, so that the explanation of investment behavior is of a partial equilibrium nature; and second, that the empirical analysis does not explicitly discriminate between the flexible accelerator model and some potential alternatives, such as "collateral-based" models.

The sixth and final paper, by Paul Krugman, is an investigation of the causes of currency crises. The issue that concerns Krugman is whether exchange-rate crises are due only to economic fundamentals (e.g., flawed macroeconomic policies that make a particular fixed exchange rate unsustainable), or whether they may also be the product of self-fulfilling expectations of exchange-rate collapse, as has been argued by a recent literature due to Maurice Obstfeld and others. In particular, Krugman makes two main points. First, he shows that the theoretical assumptions common to the recent literature, (1) that the government is optimizing and (2) that its decision to abandon the fixed exchange rate may depend on both the level and expected rate of change of the exchange rate, are not sufficient in and of themselves to generate self-fulfilling runs on the currency. Instead, if (for example) fundamentals are expected to deteriorate over time, then it still may be the case that the timing of the run is determinate (occurring at the first moment that it can

succeed, as determined by a backward induction) and related solely to fundamentals. Second, as an empirical matter, Krugman argues that fundamental factors are probably adequate to explain the recent speculative attacks on the ERM and the Mexican peso, notwithstanding the conclusions by some economists that self-fulfilling expectations played an important role in these episodes.

The discussants agreed with Krugman's point that deteriorating fundamentals can sometimes be enough to rule out multiple equilibria, but argued that this result is not generic. In particular, although the conditions under which self-fulfilling crises can occur are typically determined by fundamentals, "sunspot" equilibria do arise for some plausible model specifications and for some range of parameter values. The more difficult issues were empirical: While it is possible to tell stories about the ERM or Mexico that appear consistent with either the unique-equilibrium or multiple-equilibrium views, tests to sharply distinguish the two types of model do not appear to exist.

Discussion also focused on the facts that exchange-rate crises are often not tied to contemporaneous adverse news, nor are they typically reflected in rising interest-rate differentials ex ante. These facts are anomalous for the single-equilibrium models favored by Krugman, assuming that expectations are rational. The two observations may be compatible with multiple-equilibrium models with rational expectations if the ex ante probability of a self-fulfilling attack is sufficiently low. However, neither Krugman nor the discussants seemed particularly satisfied with this resolution, suggesting that additional theoretical analyses of exchange-rate crises remain to be done.

We close with some acknowledgments. First, all participants at the meeting owe special thanks to the NBER's conference department for its flawless management of the conference's logistics, despite the intervention of a blizzard that disrupted everyone's best-laid plans. Ilian Mihov did an excellent job as assistant editor for the volume. Finally, we thank Martin Feldstein and the National Bureau for its continued support of the Macro Annual conference and publication, now in its eleventh year.

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