

The Effect of Disability Payments on Household Earnings and Income: Evidence from the SSI Children's Program

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In December, 2012, the Social Security Administration (SSA) invited proposals from the Retirement Research Consortium to “independently review and evaluate the data, assumptions, and methods underlying models of the Pension Benefit Guaranty Corporation’s (PBGC) pension plan insurance programs and related models of pension funding and sustainability.” In response to this request, a team of researchers affiliated with the National Bureau of Economic Research (NBER) and the Brookings Institution prepared this analysis of PBGC’s Pension Insurance Modeling System (PIMS).

Our analysis suggests that the PIMS model was, in many ways, “state-of-the-art” when it was created approximately two decades ago. The use of stochastic simulation tools is a clear improvement over the deterministic model used previously. Among other benefits, a stochastic simulation model helps interested parties understand that there is a distribution of possible outcomes, not just an average outcome – a fact that is especially important for a program that is largely insuring against extreme events. It is also clear that the professional staff at PBGC has a deep understanding of both the capabilities and the limitations of the model. It is our impression that PBGC staff is committed to the principle that the PIMS model should be as unbiased as possible and insulated from political considerations.

However, several key components of the model have not been revised to reflect the availability of new tools, new insights from the academic literature, or even new data. PIMS has developed into a considerably more important tool for policymakers than was initially envisioned, but resources for PIMS have not risen commensurately, and budget and staffing constraints appear to have limited PBGC’s ability to keep the model up-to-date.

Our review also highlights three features of the existing governance system for overseeing PIMS: (i) some of the model documentation is internally inconsistent and outdated, (ii) the process for updating data and model parameters appears, at least to external observers, ad hoc, and (iii) there does not appear to exist any publicly available, systematic inventory of the robustness checks that have been performed. Indeed, to the extent that methods or assumptions are tested, this fact is not documented in any central location, making it difficult to assess which features of the model are most critical. Other long-term models that are important to federal programs – such as the actuarial models underlying the report of the Trustees of the Social Security and Medicare programs – regularly undergo an external review by a technical panel of outside experts, a process that has led to continual improvement of those models over time.

A key finding of our review is that the limited treatment of correlated risk factors arising from the macroeconomic environment is likely to substantially understate the degree of fiscal risk to PBGC's insurance programs. This may be one reason that actual PBGC results have come out much below PIMS' median projections. In the PIMS model, there are very few avenues through which broader macroeconomic factors can operate directly on the distribution of potential future losses. In reality, however, macroeconomic factors directly affect many of the key drivers of PBGC's finances: for example, during an economic downturn, it is reasonable to expect more plan sponsors to experience financial distress and more plans to be underfunded. Consequently, the distribution of possible loss exposure has much "fatter tails" (that is, the probability of extreme losses is much greater) than is currently captured by the PIMS model. This matters because PBGC and other insurers have an asymmetric exposure to fat tails, being hurt more by the negative extremes than they are aided by the positive extremes.

Although our analysis focuses narrowly on the PIMS model, rather than broader policy questions about the pension insurance program, it is worth stressing that these extreme negative events are most likely to occur in states of the world in which the broader U.S. economy is relatively weak, which means that it would be a particularly economically painful time for the nation to have to address an underfunded pension insurance program. Recognizing the true economic costs of these correlated risks and how they affect the broader fiscal position of the U.S. government, therefore, has potentially important implications for program design, the average level of premiums, the question of whether to risk-adjust premiums, and other important policy parameters which are well beyond the scope of this narrow technical review of the PIMS model. Our review provides a number of specific observations about the model that could be used to guide future revisions to the model in this respect, particularly with regard to the modeling of the bankruptcy and financial market processes.

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