

# Estimating the Consequences of Philippine Pension Reform

Martin R. Holmer\*  
Policy Simulation Group†

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## Preface

This report summarizes the results of work conducted as a short-term pension tax policy advisor to the Philippine government. This technical assistance is being provided through the USAID-funded AGILE project. The report contains general comments on the pension reform agenda described in a draft white paper and preliminary quantitative results on the individual income tax revenue effects of the PERA voluntary individual retirement account proposal. These quantitative estimates are generated using a preliminary version of PERATAX, a microsimulation model of individual income tax and PERA policy and behavior, that utilizes as its database the 1997 Family Income and Expenditure Survey.

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\* Email address: [holmer@polsim.com](mailto:holmer@polsim.com)

† Web site: [www.polsim.com](http://www.polsim.com)

## **Comments on White Paper Reform Agenda**

The draft white paper contains an insightful analysis of current-law retirement income policy in the Philippines. Its recommendations on the general direction for reform are sensible. The two specific issues discussed here focus less on the grand strategy and more on the practical tactics of reforming the Philippine retirement income system.

### **Third and Fourth Tier Reforms: The Role of Pag-IBIG**

The draft white paper views Pag-IBIG as a problem because it is a provident fund that has invested mostly in below-market-rate home mortgages, and therefore, has produced a low return on the contributions of its members. The draft white paper is correct in its view that the housing-finance and retirement-saving functions of Pag-IBIG should be separated. But from a tactical reform perspective, the recommended manner in which this is done may not be optimal.

The draft white paper calls for Pag-IBIG to be transformed into a housing finance institution by closing down its activities as a provident fund. In place of the provident fund, a mandatory third tier defined-contribution (DC) employer-sponsored pension program would be instituted. In addition, a voluntary DC pension plan (PERA) would be added as a fourth tier of the retirement income system. The draft white paper identifies a need for a regulatory agency to oversee the new DC pensions in the third and fourth tiers, but makes no concrete suggestions about how to establish such an organization. One possibility that should be considered is turning Pag-IBIG into that DC pension agency and adding to its regulatory functions a record-keeping function that is described below.

There are several reasons why this tactical approach to reforming the third and fourth tiers may be more practical than the approach recommended in the draft white paper. First, there are reasons why the secondary mortgage finance institution would be better housed in a new quasi-governmental corporation. And second, Pag-IBIG's long-standing relations with employers and employees would be valuable assets in enabling it to perform DC pension regulation and record-keeping activities.

The 1997 World Bank missions on housing finance envisioned a secondary mortgage market institution that was a quasi-governmental corporation, like Freddie Mac or Fannie Mae in the United States. But it was well understood that a wide range of mortgage-origination and capital-markets reforms would have to be enacted before such an institution could be expected to finance home mortgages from the capital markets. Pag-IBIG's remarks at the most recent Contractual Savings Task Force (CSTF) meeting underscore the fact that these requisite reforms are not yet in place. One tactic is to transform Pag-IBIG into such an institution, but this sacrifices Pag-IBIG's considerable organizational experience at dealing with employers and employees, collecting contributions, and keeping records of those contributions. And it also neglects the problem that there is a ceiling on the number of government agencies.

An alternative tactic is for the housing initiative to create a new government-sponsored corporation (that does not "count" as a government agency) and for the retirement income

initiative to transform Pag-IBIG into the DC pension agency (leaving the regulation of OPPs unchanged for now). This tactical approach would essentially turn the existing provident fund that centrally controls investment decisions into a record-keeping and regulatory agency that facilitates the decentralized investment decisions of those who own the new DC pensions.

The record-keeping role that Pag-IBIG could play is not envisioned anywhere in the draft white paper. There are two main arguments for considering such an additional role for the DC pension regulator. First, decentralized DC pension programs tend to have high administrative costs, even after an initial startup period. And second, the static tax revenue loss to the government may only partially be made up by the dynamic economic growth effects of the DC pensions (more on this in the second section of the report), making it desirable to consider how the implementation of these DC pensions could be done in a way that might raise tax compliance rates, and thus be presented as revenue neutral reforms.

The record-keeping role envisions both mandatory and voluntary DC contributions being made to the pension agency, which keeps records of the amount of the individual contribution as well as the individual's asset allocation across all the approved investment options. Aggregating individual allocation amounts, the DC pension agency would transfer the total amount of funds to each private DC pension investment vendor (mutual fund, life insurance, bank, pre-need, etc.). This arrangement, which is currently being implemented in Sweden for its mandatory DC pension tier, has several advantages. First, its centralized record-keeping function should produce reductions in administrative costs, without retaining centralized control of the investments. Second, the use of a single record-keeping system for both the third and fourth tier DC pensions would also reduce the social cost of implementing DC pensions in the Philippines. Perhaps more important is the potential for such centralized record-keeping to improve compliance, not only tax compliance, but also compliance in contributing to SSS. Offering EET tax-treatment of the mandatory and voluntary DC pensions (which is needed to promote saving), creates a clear need to ensure that the income that forms the base of the DC pension contribution is being reported to both BIR and SSS. The draft white paper's implicit recommendation of totally decentralized record-keeping activities is likely to lead not only to relatively high administrative costs, but also to a lost opportunity to raise compliance rates in the Philippines.

### **Second Tier Reforms: The Need for a Retirement Income Estimation Capability**

The draft white paper's argument that replacement rates are too high in the mandatory government-sponsored defined-benefit (DB) pension system appears to be correct, but may be questioned by some in the Philippines. As the pension reform effort continues, it may be desirable for AGILE to provide a capability for estimating retirement income levels and replacement rates for people who have experienced different kinds of lifetime work histories. Essentially the draft white paper is calling for DB pension reductions, which are never popular with politicians or the public. Having a simulation model that

can estimate retirement income from all four tiers for typical low-, middle-, and high-income individuals, will be able to document the draft white paper's assertions, and therefore, make it easier for such benefit reductions to be considered. Already, some of the CSTF members' comments on the draft white paper have asked for documentation of the assertion that benefit levels are too high.

While producing quantitative estimates of the tax revenue effects of pension reform is important, it is also essential to have the capability of estimating the retirement income effects of pension reform. At the present, there seems to be no plans to develop such a capability. As the pension reform progresses, it will be important to consider whether such a model, which plays a central role in the policy debate in other countries, should be developed for the Philippines.<sup>1</sup>

## **Preliminary Estimates of PERA's Effect on Tax Revenue**

The second section of this report describes a simulation model that has been developed to estimate the individual income tax revenue effects of a tax-favored, fourth tier, voluntary DC pension plan, such as the proposed PERA. After the model is described, preliminary estimates are presented and options for further development of the model are outlined.

### **Microsimulation Methodology**

The simulation model developed as part of this task uses a microsimulation methodology. This is standard methodology for tax estimation work in developed countries.<sup>2</sup> And it is the methodology being developed for the Philippine Department of Finance by the USAID-funded Fiscal Policy Analysis Activity (FPAA).

Microsimulation produces aggregate results by simulating the behavior of individuals in a sample survey of the population, and then using the survey's sampling weights to add up simulated amounts for all the individuals. So, for example, if aggregate individual tax revenues need to be estimated, a computer program (the simulator) is written that contains policy parameters describing the government tax program, as well as behavioral parameters describing how individuals react to that tax policy. The simulator uses the information from the sample survey (the database) on each individual to simulate that individual's tax-paying behavior and resulting taxes paid. Aggregate taxes paid are estimated by weighting each individual's taxes paid by that individual's survey sampling weight and adding up all the weighted taxes paid.

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- 1 In the United States, the SSASIM model is used by a variety of governmental and private-sector organizations to produce social security replacement rate estimates. For more information, see *Introductory Guide to SSASIM*, Washington, DC: Policy Simulation Group, August 1999. <<http://www.polsim.com/guide.pdf>>
  - 2 For a discussion of the application of this methodology to income tax estimation in the United States, see Constance F. Citro and Eric A. Hanushek, eds., *Improving Information for Social Policy Decisions: The Uses of Microsimulation Modeling, Volume I: Review and Recommendations*, Washington, DC: National Academy Press, 1991.

Microsimulation methodology has the advantage of being able to represent the fact that individuals at different income levels and in different family and employment situations are likely to behave differently. For example, tax compliance is much higher for government workers than for private-sector workers. And saving behavior will differ substantially in above- and below-average income families. All of this variation in behavior would be extremely difficult to characterize in any kind of macro model that deals with aggregate amounts.

### **Family Income and Expenditure Survey (FIES) Database**

The database used for the microsimulation model is the 1997 edition of the FIES, which is conducted by the Philippine National Statistics Office every three years. This is the official survey used by the government to estimate average family income, expenditure, and saving by income level and by region. Its advantages for this project include that FIES includes information on both family income (by source) and expenditures, and therefore, a measure of family saving. Its major shortcoming for this project is that while the number of employed individuals in a family is known, the share of family income earned by each is not known.

The details of how the 1997 FIES public-use file was processed into a FoxPro database suitable for use by the microsimulation model are documented in the source code of the FoxPro programs that have been developed to accomplish this transformation.<sup>3</sup>

### **Logical Structure of PERATAX Model**

The simulator itself, which is called the PERATAX model, has been developed as a FoxPro program contained in the PERATAX.prg file. FoxPro 2.6 (DOS version) was selected as the development environment because FoxPro programs are relatively fast and reliable, and because the FPAA models will also be structured as database programs that process individual-level information stored in a database. FPAA is planning to use Access, which is another Microsoft database product. Because both FoxPro and Access are made by Microsoft, there is an ability in Access to import information from a FoxPro database.

A copy of FoxPro 2.6, which is needed to run FoxPro programs, as well as copies of the FoxPro program that is the simulator (PERATAX.prg) and the FoxPro programs that create the database (FIES.dbf) used by the simulator, have all been left on an AGILE computer that can read the 1997 FIES public-use file CD, which has been acquired from the National Statistics Office.<sup>4</sup> The database can also be read and the programs can also be executed by more recent versions of FoxPro, such as Visual FoxPro 6.0.

Detailed documentation of the PERATAX model can be found in the source-code comments contained in the PERATAX.prg file. The high-level logic of the model is to process the 39,520 FIES families by doing the following for each family: (1) specify the assumed tax and PERA policy and behavioral parameters, (2) age the family's income

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<sup>3</sup> See the comments in the FIESsee.prg, FIEScnt.prg, FIESfix.prg, and FIESext.prg programs.

<sup>4</sup> The only computer at the AGILE/DOF office that has a CD drive is that of the office manager.

and expenditure variables from 1997 to 1998, (3) separate family earnings among those in the family that are employed, (4) simulate each individual's PERA/SepPERA participation and contribution behavior given the values of the PERA policy and behavioral parameters, (5) simulate each individual's income tax behavior given the values of the tax policy and behavioral parameters, (6) optionally write the simulated individual contribution and tax amounts to a detailed results database, and (7) tally the simulated individual contribution and tax amounts into aggregate results. In step (2), all income and expenditure variables are inflated by 8.74 percent, which was the rate of nominal GNP growth from 1997 to 1998.

Each model run produces estimates of aggregate PERA participation and contributions, as well as aggregate individual income taxes paid, given the policy and behavioral parameters assumed in the run. The effects of introducing PERA are estimated by comparing the results from two runs, one of which assumes no PERA participation and the other of which assumes some PERA participation. Given the assumed tax treatment of PERA contributions, the difference in the two run's total taxes paid is the estimate of the revenue effects of introducing PERA. Such estimates will be presented below, following a brief discussion of the tax and PERA policy and behavioral assumptions used in the model runs.

### **Individual Income Tax Policy and Behavioral Assumptions<sup>5</sup>**

The individual income tax policy parameters assumed in all the PERATAX model runs are for calendar year 1998. They reflect the structure of the tax system following the 1997 reforms. For details, see the source code for the model in the PERATAX.prg file.

Assuming full tax compliance produces estimates of individual income taxes paid and returns filed that are well above the 51.6 billion pesos (bP) and 2.25 million returns reported in the BIR 1998 Annual Report on pages 43 and 52, respectively. The approach adopted in the PERATAX model is to assume that tax behavior can be described as involving two steps: first a tax return filing decision and then an income reporting decision. The behavior assumed in the PERATAX model runs reported below are described here, but this behavior is controlled by model parameters that can easily be changed to describe alternative behavior.

The probability of filing a return (a joint return for a married couple even though they pay taxes based only on their own income; an individual return for everyone else) is assumed to vary depending on the level of per capita income for the person(s) who would be filing. The probability varies from 0 percent (never files) for individuals with annual per capita income below 50,000 pesos to 100 percent (always files) for individuals with annual per capita income above 300,000 pesos. Individuals with income between 50,000 and 300,000 pesos are assumed to have filing probabilities between 0 and 100 percent, with the intermediate probabilities being calculated by linear interpolation. So, for example, a couple with a combined annual income of 350,000 pesos has a per capita annual income

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<sup>5</sup> Khwaja Sultan has provided helpful advice about how to characterize tax behavior and the FPAA staff have provided considerable help in describing individual income tax policy following the 1997 reform.

of 175,000 pesos, which implies a filing probability of 50 percent because 175,000 is exactly midway between 50,000 and 300,000 pesos. The 50 percent probability is used with a random number generator to stochastically select filers. This Monte Carlo simulation methodology implies that close to half the individuals with a 50 percent filing probability will be simulated to file while the other half will be simulated to not file. This random selection of filers according to their filing probability is modified in just two ways. First, government workers (and their spouse) are assumed to always file no matter what their income level because the government withholds their taxes. And second, married couples are assumed to always make the same filing decision.

Once an individual or married couple decides to file a tax return, there is an income reporting decision. In the PERATAX runs reported below, it is assumed that filers report 100 percent of their wage and salary income and 42 percent of the self-employment income (called entrepreneurial income in the FIES).

Together these assumptions about filing and income-reporting behavior generate estimates of taxes paid and returns filed that equal the actual 1998 figures of 51.6 bP and 2.25 million returns. While this is an admittedly crude characterization of tax compliance behavior, further work by the FPAA may generate data that could be used to refine these tax compliance assumptions.

#### **PERA/SepPERA Policy and Behavioral Assumptions<sup>6</sup>**

The PERA policy parameters assumed in the model runs reported below represent the fourth tier voluntary DC pension as two individual retirement account programs, one for saving out of wage and salary earnings (the PERA program) and the other for saving out of self-employment earnings (the SepPERA program). Contributions could be made to both programs (up to each program's maximum contribution amount) by individuals who received both kinds of earnings.

The maximum contribution rates for the PERA and SepPERA programs are 15 and 23 percent, respectively. The maximum annual contribution amount is the maximum contribution rate multiplied by the minimum of two annual earnings levels: the individual's actual earnings and the annualized SSS average monthly salary credit. This later figure has been set at 100,000 pesos at the suggestion of Steve Lewarne. The somewhat higher first-year maximum contribution levels (18,000 and 36,000 pesos for PERA and SepPERA, respectively) have not been simulated in the runs reported below.

The income tax treatment of PERA/SepPERA contributions is assumed to be a 15 percent non-refundable tax credit. This means that if an individual with a tax liability of 1,000 pesos contributes 2,000 pesos, the tax credit of 300 pesos reduces the tax liability to 700 pesos. If the same individual owed only 200 pesos in taxes, the tax credit of 300 pesos would only reduce the tax liability to zero.

PERA/SepPERA participation and contribution behavior are difficult to simulate because

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<sup>6</sup> David Bardsley has provided helpful advice about how to characterize PERA behavior and considerable help in describing the structure of the proposed PERA/SepPERA.

little is known about how people in the Philippines will react to such programs. Even after years of studying the ongoing IRA program in the United States, there are major disputes concerning the behavioral effects of the program. The best that can be done here is to make some educated guesses about how many individuals would participate and how much they would contribute to their accounts. The assumptions about PERA behavior will be informed by the FIES information about family saving rates, but they remain educated guesses.

Assumptions about PERA participation and contribution behavior are based on family saving rates. A family's annual saving is calculated as adjusted income minus expenditures. Annual family expenditures are taken directly from the FIES, while the FIES annual family income figure is adjusted by subtracting several types of income. The types of income subtracted in this adjustment process include: imputed rental value of an owner-occupied house, net share of crops, income from family sustenance activities, and gifts (which is a minor item that does not include cash assistance from those living abroad or from those living outside the home in the Philippines). The rental value of owner-occupied housing is, by far, the largest of these adjustments.

Aggregating over all the 14.2 million Philippine families, the income, adjusted income, expenditure, and saving statistics for 1998 are as follows:

total FIES income	1,900.8 bP
adjusted income	1,613.6 bP
total FIES expenditure	1,536.2 bP
annual family saving	77.4 bP
saving rate (out of adjusted income)	4.8 %

It is the value of the saving rate out of adjusted income for a family that is used in the model to simulate PERA participation and contribution behavior by individuals who are members of that family.

The probability of PERA participation is assumed to vary depending on the level of the individual's family saving rate. The probability varies from 0 percent (never participates) for individuals with family saving rates below an assumed never-participates rate. Individuals in families with a saving rate above an assumed always-participates rate are assumed to have a 100 percent participation probability. Individuals with family saving rates between these two rates are assumed to participate at a probability that is interpolated between the never- and always-participates rates (just as is the case with the tax filing probability). The values of the never- and always-participates family saving rates have been set at two different levels in the runs reported below in order to provide information on the sensitivity of the results to changes in assumptions about PERA participation. Under all assumptions, individuals who live in families with a negative or zero saving rate (this includes about 58 percent of all Philippine families) are assumed to never participate in the PERA/SepPERA programs.

Once an individual decides to participate, there is a decision about how much to

contribute out of wage and salary earnings and out of self-employment earnings. This retirement saving decision is even more difficult to characterize than the program participation decision because the economics profession knows little about saving behavior. In the model runs reported below, it is simply assumed that a participating individual selects a contribution rate that equals the sum of the family's saving rate (as defined above) plus an assumed saving rate differential (which can be zero, positive, or negative). In the model runs reported below, two assumptions are made about the value of this saving rate differential in order to provide a measure of the sensitivity of the results to assumptions about contribution behavior.

### **PERA's Static Individual Income Tax Revenue Effect**

First, the static revenue effect of introducing the PERA/SepPERA programs is estimated under two sets of assumptions about PERA behavior. These static estimates assume that there are no economic growth (or tax compliance) effects that would offset the revenue loss caused by the tax credit granted to program contributions. A discussion of the possible dynamic (economic growth) effects is presented in the following section.

The two sets of assumptions concerning PERA behavior are described below:

	<i>Set A</i>	<i>Set B</i>
never-participates saving rate	0 %	15 %
always-participates saving rate	15 %	30 %
saving rate differential	0 %	-15 %

The individual income tax revenue effects of the PERA/SepPERA programs under these two assumptions are as follows:

	<i>Set A</i>	<i>Set B</i>
number of accounts (millions)	10.7	6.9
account contributions (bP)	76.2	44.2
income tax revenue loss (bP)	3.54 [6.9%]	2.30 [4.5%]

Essentially the low rate of tax compliance limits the loss in tax revenue. In the words of a classic American blues lyric, "you can't loose what you ain't never had."

### **PERA's Dynamic Individual Income Tax Revenue Effect**

Is it plausible to think that the additional saving generated by the availability of the PERA and SepPERA programs would generate enough additional domestic investment to raise the rate of economic growth substantially? Would the resulting reform-induced increase in GDP and earnings generate additional income tax revenues large enough to offset the static revenue loss estimated above? These are difficult questions to answer because they depend on series of assumptions, each one of which is highly debatable. What fraction of the PERA/SepPERA contributions represent new saving (as opposed to funds that are shifted from existing taxable forms of savings such as bank savings accounts)? What fraction of the new saving would increase investment in the domestic capital stock? (This could be less than one hundred percent even if no foreign investment of account

funds is allowed because the increased domestic saving may partially substitute for foreign investment.) And finally, how long will it take for the higher rate of domestic investment to raise per capita GDP and earnings levels.<sup>7</sup> Prior work in other countries suggests that the long-term increase in per capital GDP and earnings is not enormous.

Further work that would allow a direct estimate of these dynamic revenue effects is described in the following section. Here a more simple question is posed and answered. How much would earnings levels have to rise to generate enough additional individual income tax revenue (assuming no change in tax compliance behavior) to offset the static revenue loss caused by the introduction of the PERA/SepPERA programs? This question can be answered with the PERATAX model by simply scaling up all family income and expenditure levels by x percent. By running several simulation runs with different values of x, the value of x that produces 51.6 bP of tax revenue (the pre-PERA reform amount) can be determined.

The results of this exercise under the two sets of PERA behavior are as follows:

	<i>Set A</i>	<i>Set B</i>
growth needed to offset static tax loss	3.4 %	2.2 %

While further work is needed to resolve some of the uncertainty surrounding the magnitude of the dynamic growth effect of the PERA/SepPERA programs, it does not seem out of the question that the dynamic revenue effects could fully offset the static revenue loss. And this is particularly true if the revenue increases caused by the dynamic economic growth effect of the new programs were considered for all kind of taxes, not just for the individual income tax.

### **Further PERATAX Model Development Options**

The saving, investment, and economic growth linkages described above could be clarified by using the NADA macroeconomic model to estimate the growth implications of increased saving.<sup>8</sup> An alternative approach would be to calibrate the economic growth model embedded in the SSASIM model so that it replicates the stylized facts of recent Philippine economic growth, and then to use this calibrated growth model to estimate the per capita GDP effect of a given percentage increase in the national saving rate, which would be produced by the PERATAX model.<sup>9</sup>

In a totally different line of development, the behavioral assumptions concerning tax compliance and PERA/SepPERA program participation and contributions used in the PERATAX model itself could be further refined. This additional work would draw on

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7 For a more complete discussion of these issues in the context of the debate over adding individual accounts to social security in the United States, see Martin R. Holmer, "Stochastic Simulation of the Economic Growth Effects of Social Security Reform" in Olivia S. Mitchell, ed., *Prospects for Social Security Reform*, Philadelphia: University of Pennsylvania Press and Pension Research Council, 1999.

8 The possibility of using the USAID-funded NADA model has been suggested by Steve Lewarne.

9 For an introduction to the SSASIM model, which has been developed over the past five years to support social security policy analysis, see *Introductory Guide to SSASIM*, Washington, DC: Policy Simulation Group, August 1999. <<http://www.polsim.com/guide.pdf>>

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the results of the FPAA individual income tax return database development activities, which should bear fruit in the coming months.

And completely apart from the needs of the pension reform effort, the model could be customized to support income tax policy analysis required by the AGILE tax policy advisory team. This is possible because the PERATAX model already contains a full characterization of the logic of the individual income tax policy and compliance behavior. One example, of tax policy analysis that could be undertaken with the model would be to estimate the magnitude of revenue increases that could be expected from different sized increases in tax-return filing rates. Such quantitative analysis would give the Philippine government a sense of the magnitude of the revenue increases that could be expected to flow from efforts to improve tax compliance.