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Financial and Actuarial State of the Ecuadorian Social Security System

By Rodrigo Ibarra

Author's note: This article is adapted from the July and August 2018 issues of "Commentary," published by the US Buffin Foundation. Data used are from the Ecuadorian Social Security Institute (IESS), statistical bulletins and simulations made by Actuaria. Conclusions and calculations are solely the responsibility of the author.

Located in the middle of the world, Ecuador is one of the most unique and diverse countries on earth, home to 17 million individuals distributed along 284,000 square kilometers in four main regions: the Andean Mountains, the Pacific coast, the Amazonian Jungle and the Galapagos Islands. In the heart of the Andean region, Quito, Ecuador's capital, is known for having the largest colonial and historical center in Latin America. Ecuador's currency has been the U.S. dollar since 2000. Its current gross domestic product is $108 billion, its growth rate is 0.9 percent, inflation 0.5 percent, unemployment rate 4.2 percent and underemployment rate (informal workers) about 50 percent. So, the Ecuadorian Social Security system is still in its early maturity stages compared to neighboring countries such as Chile. With the new millennium, not only came the dollarization of the economy but also an increase in the elderly population and a critically reduced workforce. Indeed, the social security system has been jeopardized by this decrease in contributions from active workers, the increase in retirees and pensioners and the mismanagement of pension funds by local entities led by poor governance.

As such, many experts have questioned the sustainability of the Retirement Fund in Ecuador. Will there be enough funds (investments plus contributions) to guarantee the payment of pensions for the next generations?

This article presents an estimate of the financial and actuarial status of the elderly, disability insurance and death insurance, also known as pension insurance, of the Ecuadorian Social Security Institute (i.e., Old-Age and Survivors Insurance and Disability Insurance, OASDI). As of December 2018, this insurance provided benefits to a total of 511,532 pensioners, including 357,380 pensioners due to their age, 120,719 pensioners for widowhood and 33,433 for disability. During 2018, approximately 3,189,915 people contributed as active members, currently representing a sustainability rate of 6.24. Although this is true today, in 40 years the rate is expected to decrease to 2.0 active contributors per pensioner.

At the end of 2018, the pension system's investment portfolio amount reached $6.31 billion, divided into four parts: $2.04 billion in government bonds and other fixed and variable income investments, $3.91 billion in mortgage loans, $104.16 million in consumer loans and $258.02 million in other investments. Our first objective is to evaluate the relationship between the present actuarial values of the cash flows that are expected to enter the fund, compared to their expenses, as provided by current regulations as a pay-as-you-go system. To achieve this, future projections were made for periods of 25, 40 and 75 years. These results provide a useful guide to measure the solvency and sustainability of the system. In this context, solvency refers to the degree of adequacy of income cash flows (including assets of the system) to meet the programmed benefits and their administrative expenses; that is, it measures the level of funding of liabilities.

The results can also be applied to determine the pension contribution rate in order to achieve a balance between the projected income and expenses' cash flows. The current contribution rate to the pension fund in 2019 is 8.86 percent; it will be 9.86 percent in 2020 and 10.46 percent from 2021 onward. Here, we present the results of the projections in three different scenarios—optimistic, moderate and pessimistic—to allow a range of possible outcomes considering the underlying economic, financial and demographic assumptions. The degree of reliability of the projections decreases as their duration increases (see Table 1 and Figure 1).

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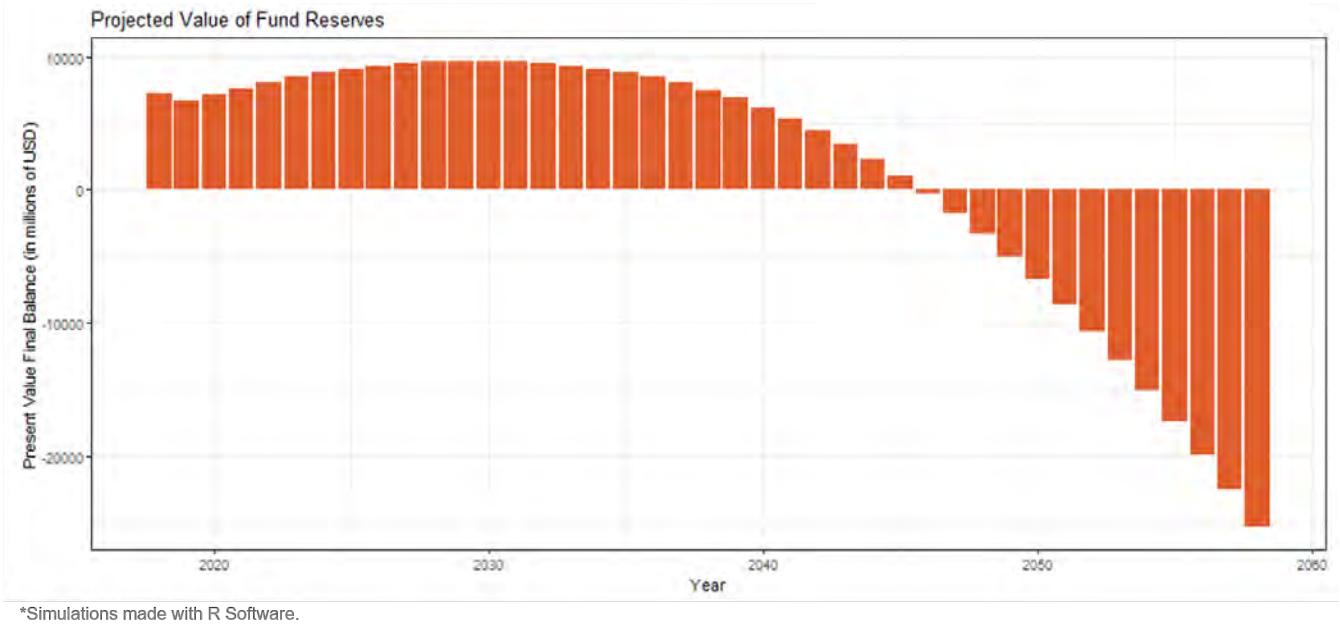
Table 1
Parameters and Results of Current Simulations

Parameter	Optimistic Scenario	Moderate Scenario	Pessimistic Scenario
Percentage of liability funding at 25 years	109.26%	103.24%	97.27%
Percentage of liability funding at 40 years	95.33%	87.31%	79.74%
Percentage of liability funding at 75 years	72.87%	66.98%	60.97%
Contribution rate until equilibrium in 25-year scenario	8.72%	9.79%	11.10%
Contribution rate until equilibrium in 40-year scenario	11.51%	13.84%	17.03%
Contribution rate until equilibrium in 75-year scenario	20.61%	25.76%	34.55%
Year the fund runs out	2055	2047	2042
Actuarial (deficit)/surplus at 25 years in USD millions	$9,235.32	$3,396.01	($2,999.30)
Actuarial (deficit)/surplus at 40 years in USD millions	($8,444.07)	($25,217.59)	($44,157.95)
Actuarial (deficit)/surplus at 75 years in USD millions	($117,251.64)	($178,467.8)	($252,797.76)

Figure 1
Simulation 1: Current Situation



Source: Data from the Ecuadorian Social Security Institute (IESS), statistical bulletins and simulations made by Actuaria.

Based on the optimistic projection, the solvency metrics for 25, 40 and 75 years are 109.26 percent, 95.33 percent and 72.87 percent, respectively. Based on the moderate projection (more likely), the corresponding solvency metrics are 103.24 percent, 87.31 percent and 66.98 percent. At 40 years, the actuarial deficit is $25.2 billion. Finally, in the pessimistic scenario, the metrics are 97.27 percent, 79.74 percent and 60.97 percent, respectively. Nevertheless, we believe that the government's projection has been overly optimistic, presenting for 40 years a solvency metric of 93.44 percent and an actuarial deficit of only $4.56 billion.

The contribution rates to reach the actuarial equilibrium that correspond to the current 8.86 percent rate, which would be required to fully cover projected expenses for all scheduled benefits and administrative expenses, are useful guidelines for solvency and system sustainability.

Based on our optimistic projection, the balance contribution rate metrics for 25, 40 and 75 years are 8.72 percent, 11.51 percent and 20.61 percent, respectively. Based on our moderate scenario, the corresponding metrics are 9.79 percent, 13.84 percent and 25.76 percent. Finally, in the pessimistic scenario, the contribution rates are 11.10 percent, 17.03 percent and 34.55

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percent, respectively. The reserves will be depleted in 2055 in the optimistic scenario, in 2047 in the moderate and in 2042 in the pessimistic scenario. All cases consider that the state will continue to contribute 40 percent of the pensions, which will represent a growing burden on the state's fiscal account.

This study also focuses on the evolution of the projected insurance fund reserves during its expected time horizon. The projected future level of the reserves allows us to determine the years of payment of benefits—that is, in how many years the pension fund reserves will be depleted. The effect resulting from this financing agreement over a period of 75 years is that the fund is expected to grow in the first years, while income exceeds expenses, but it will finally decrease in subsequent years when the opposite occurs. It is designed to reach its maximum after approximately 35 years and get to zero at the end of the 75-year period.

This so-called reserve depletion is not an unexpected weakness of the system; it is inherent in the financing agreement. Nowadays, the fund's reserves amount to $6.54 billion—that is, less than two years of pension expenditures. During 2019, the yearly pension expenses are estimated to be $3.95 billion and the income from contributions only $2.49 billion. The state contribution, representing 40 percent of the 2019 pension expense, is estimated to be $1.58 billion, but by 2024 it will be $2.19 billion and thus it will continue to grow accordingly.

Additionally, the intention of this article is to compare the results of the projections from Ecuador to those of the United States, in order to provide a useful guide to the solvency and sustainability of both systems. As detailed in Table 2, for the U.S. the percentage of liability funding at 25 years in the three scenarios is 104.66 percent, 92.81 percent and 82.49 percent, respectively. The percentage of liability funding at 75 years in the three scenarios is 102.10 percent, 83.78 percent and 68.80 percent, respectively. This means that in the moderate scenario at 75 years, the cash flows from investments do not match the obligations, both in the U.S. and in the case of Ecuador.

According to the July 2018 issue of "Commentary," published by the Buffin Foundation, in the U.S., "the current payroll tax rate for 2018, payable for both workers and employers, was 6.20 percent of covered earnings up to a limit of $128,400."

The U.S. contribution rate (payable by both workers and employers until equilibrium) at 25 years in the three scenarios is 5.88 percent, 6.77 percent and 7.78 percent, respectively. The contribution rate until equilibrium in 75 years in the three scenarios is 6.06 percent, 7.54 percent and 9.42 percent, respectively.

Last, it is important to distinguish the number of pensioners and active affiliates or contributors in both systems. In Ecuador there are over half a million pensioners and in the U.S., over 60 million. In Ecuador, the number of contributors is over 3 million, whereas in the U.S. there are about 130 million contributors. The relationship between the active contributors and pensioners in the United States and in Ecuador is 2.85 and 6.23, respectively, as shown in Table 3.

Table 2
Comparison Between Ecuador and the United States

Parameter	Optimistic		Moderate		Pessimistic	
	Ecuador	U.S.	Ecuador	U.S.	Ecuador	U.S.
Percentage of liability funding at 25 years	109.26%	104.66%	103.24%	92.81%	97.27%	82.49%
Percentage of liability funding at 75 years	72.87%	102.10%	66.98%	83.78%	60.97%	68.80%
Contribution rate until equilibrium in 25-year scenario	8.72%	5.88%	9.79%	6.77%	11.10%	7.78%
Contribution rate until equilibrium in 75-year scenario	20.61%	6.06%	25.76%	7.54%	34.55%	9.42%

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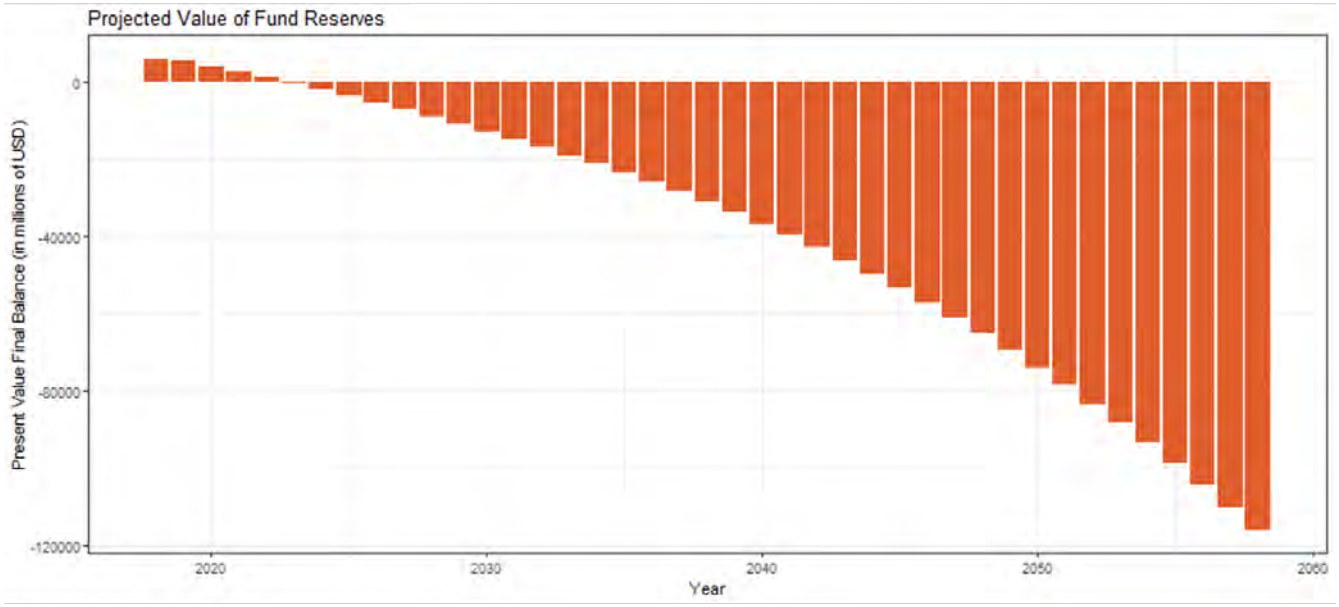
Table 3
Type of Pensioners

Type of Member	Ecuador		United States	
	No. of Persons	Percentage Compared to Population	Approximate No. of Persons	Percentage Compared to Population
Pensioners	511,532	2.99%	61,000,000	18.64%
Pensioners of old age	357,380	2.09%	45,000,000	13.75%
Pensioners of widowhood	120,719	0.71%	6,000,000	1.83%
Pensioners of disability	33,433	0.20%	10,000,000	3.06%
Active Contributors	3,189,915	18.65%	174,000,000	53.18%
Population 2018	17,100,000		327,200,000	
Sustainability rate (active contributors / pensioners)	6.24	2.85		

Figure 2
Simulation 2: No Government Contribution and 8.86 Percent Contribution Rate



Source: Data from the Ecuadorian Social Security Institute (IESS), statistical bulletins and simulations made by Actuaria.

Finally, in order to emphasize the financial and actuarial impact of the various metrics, we have added a simulation (Figure 2) showing the situation of the OASDI pension fund if the state's contribution of 40 percent were eliminated, the individual contribution stayed at 8.86 percent and the retirement age were left unchanged at 60 years.

In a nutshell, the Ecuadorian Social Security system needs to make substantial changes to its fundamentals in order to guarantee the sustainability of both its active and pensioner population. ■

Rodrigo Ibarra is the CEO of Actuaria Consultores C. Ltd. based in Quito, Ecuador, and a professor at Universidad San Francisco de Quito (USFQ). He can be reached at *rodrigo.ibarra@actuaria.com.ec.*

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