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FINANCIAL ANALYSIS

FOR THE

TEMPORARY SOCIAL SECURITY REGIME REGARDING OLD AGE, DISABILITY AND DEATH FOR STATE WORKERS IN TIMOR-LESTE

October 2012

Human Development Sector Unit
East Asia and Pacific Region

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FISCAL YEAR

January 1 to December 31

ABBREVIATIONS AND ACRONYMS

CPI	Consumer Price Index
CSC	Civil Service Commission
ESI	Estimated Sustainable Income
GDP	Gross Domestic Product
MoF	Ministry of Finance
MSS	Ministry of Social Solidarity
PF	Petroleum Fund
RA	Retirement Age
USD	United States Dollars

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Executive Summary

This report has been prepared by the World Bank at the request of the Government of Timor-Leste and will be used to assist the government with short-term budgeting and understanding the long-term dynamics of its new pension program. It summarizes our findings regarding the financial and actuarial status of Timor-Leste's pension program for civil servants, the "Temporary Social Security Regime Regarding Old Age, Disability and Death for State Workers".

There are several aspects of this pension program that may require close attention from the government of Timor-Leste:

- While the short-term cost of the program in USD and as a percent of total public transfers is low, the cost will increase significantly as the program matures. Our analysis also indicates that costs as a percent of GDP will increase through 2040 and then start to decline. This is based on an assumption of continued high real GDP growth, driven by a growing population and the economic benefits that can accrue from an expected large demographic dividend. However, it is far from certain that this will occur
- Timor-Leste is expecting rapid population growth over the next 75 years. The growth of the population, decentralization and the expected transition to a middle income country will drive the need for a growing number of future civil servants. Based on discussions with senior government officials, we have assumed that the number of civil servants will need to grow in proportion to expected population growth in order to provide quality public services to all citizens
- Our estimates of the short-term cost cannot be as accurate as they would normally be for a plan of this type because the initial number of beneficiaries and the benefits they are entitled to have not yet been determined. Consequently, they are based on best estimates only. Costs should be revised once the pension program has identified eligible beneficiaries and begun making payments
- If the government chooses to fund the program on a contributory basis, the cost of the program as a percent of covered payroll will increase sharply over time due to the growing number of beneficiaries relative to contributors. The government will need to decide whether to increase payroll contributions over time or charge a rate equal to the long-term cost from the start.
- If the payroll contribution rate is set equal to the expected long-term program costs, significant asset accumulation will occur and those assets will have to be properly invested and managed.
- The plan contains several non-standard features that were included to recognize the unique history of Timor-Leste, its recent independence and emergence from conflict, and the fragility of the existing peace. These features might be acceptable for a plan covering civil servants only, but would not be appropriate as the basis for a national pension system
- While the law has been enacted, payment of benefits has not yet begun. It is important for the government to quickly set up the required administrative structure for the new pension system

so that benefit applications can be received and approved, benefit amounts can be calculated, and payments can begin

- In the longer-term, the government of Timor-Leste may need to decide whether the design of the civil service pension program is appropriate and may wish to adjust some of the parameters
- If the government of Timor-Leste wishes to establish a national pension program, we suggest the civil service pension program not be used as the basis for that system. The two programs should have very different goals and objectives.

This report summarizes our findings regarding the financial and actuarial status of Timor-Leste's pension program for civil servants, the "**Temporary Social Security Regime Regarding Old Age, Disability and Death for State Workers"**. This report has been prepared by the World Bank at the request of the Government of Timor-Leste and will be used to assist the government with short-term budgeting and understanding the long-term dynamics of its new pension program.

In order to prepare financial and actuarial analysis of the civil service pension program, it is necessary to obtain data for the group of employees that will be covered by the program, to make various assumptions about the demographic and economic environment in which the plan will operate and to properly reflect eligibility and benefits provided under the program.

Section I of this report briefly summarizes the legal environment and the provisions of the pension program for civil servants. Section II summarizes the results of our analysis and estimates the cost of the program on a pay-as-you-go basis with payments from the budget, and on a funded basis with contributions as a percent of payroll. Section III discusses the sources of the input data and the methods we used to prepare the data for use in this valuation. Section IV summarizes the macroeconomic and demographic assumptions used to prepare this valuation report. Section V comments on some of the non-standard design features of the pension program. Finally, Section VI summarizes our findings and discusses the next steps required in the implementation of the civil service pension program.

I. Legal Environment

The law regarding the "Temporary Social Security Regime Regarding Old Age, Disability and Death for State Workers" was enacted by the President of Timor-Leste in February 2012. In Timor-Leste, laws are effective 90 days following their date of publication in the official gazette. Consequently, this pension program should have begun making payments to eligible beneficiaries on 1 June 2012.

As is typical for civil servant pension programs, this plan provides old age, total and permanent disability, and survivor benefits. Old age benefits under this pension plan are equal to 75% of average base salary for anyone who attains age 60 and has completed at least 60 months of service as a civil servant, including service from 20 May 2002 through the plan start date. The 60 month requirement increases to 108 months by 2015.

Average salary under this plan is based on base salary only, excluding overtime and allowances and pay is averaged over a worker's entire career. To calculate average salary, the career regime in effect at the time of retirement is used. The current salary for the position that the civil servant occupied in each month of his or her career is then used to calculate average salary for purposes of calculating pension benefits.

Disability pension benefits are available to workers who are totally and permanently disabled. This generally means that the individual is incapable of working at all or the disability is expected to result in death. Benefits are payable starting from the time the disability pension is approved and is payable until death or recovery. The benefit is 75% of average base salary at the time of disability retirement and there is no minimum period of service requirement.

Survivor benefits are payable to eligible beneficiaries which includes the participant's spouse and children under age 17. The benefit amount and the payment period vary greatly depending on circumstances, as follows:

- Surviving spouse and no minor children: 65% of average salary or pension; payable for one year
- Surviving spouse of pension age: 65% of average salary or pension; payable for life
- Surviving spouse with minor children: 100% of average salary or pension; payable until last child attains age 17
- Minor children of beneficiary if no surviving spouse or they are not the children of the surviving spouse: 100% of average salary or pension; payable until each child turns 17, providing they are attending school.

After pension payments begin, benefits are increased at the discretion of the government. In deciding whether to increase benefits, the law states that the government should examine the rate of inflation and increase in wages since the time of retirement or the last increase.

Although the pension program has just been established, some current active civil servants will be eligible for old age or disability retirement on the plan start date and some beneficiaries of deceased civil servants will similarly be eligible for survivor benefit on the plan start date. This is because the pension program provides "past service credit" – credit for years worked as a civil servant after the date of independence (20 May 20002) and prior to the plan start date. The plan also provides disability pensions to those who are totally and permanently disabled on the plan start date and survivor benefits to eligible beneficiaries of those civil servants who died between 20 May 2002 and the plan start date.

The Timor-Leste pension program for civil servants has several unusual plan design features compared with most civil service or national pension programs.

- The old age pension benefit is 75% of average base salary for everyone who meets the minimum service requirement and has attained the minimum retirement age. The usual practice is to grant a pension equal to a percent of average base pay for each year of service so those with longer service receive higher benefits. A typical formula would be 2% of average base pay for each year of service. This formula would grant a benefit of 20% of average pay for someone with 10 years of service and 80% of pay for someone with 40 years of service

- There is no mandatory or normal retirement age, just a minimum retirement age. Civil service programs often have a mandatory retirement age – an age when civil servants must retire. This age often varies by position. National social security systems typically have a normal retirement age and a minimum retirement age, but not a mandatory retirement age. The normal retirement age is the age when a participant is able to retire and receive a full benefit. The participant often has the right to voluntarily retire prior to normal retirement age and on or after the minimum retirement age, but the benefit is reduced to reflect the longer expected payment period. Timor-Leste's civil service pension plan has only a minimum retirement age. Civil servants can retire at that age, or at a later age by mutual consent

- There is an extreme variation in payout period for survivor benefits ranging from one year to lifetime benefits. Normally, spouse benefits are payable for life or until remarriage, and payments to children continue until the earlier of marriage, full time employment or the age when university schooling is completed (typically age 21 to 24)

- Survivor benefits are payable to beneficiaries of those who died prior to the start of the civil service pension scheme

- Normally civil service or national social security plans guarantee increases in pension payments tied to an index. Typically benefits are indexed to inflation as measured by the consumer price index (CPI).

II. Results

Particularly for the next 5-10 years, the government of Timor-Leste is likely to be most interested in the amount of benefits that must be paid to beneficiaries. These will constitute additional public transfers (if paid from the budget) or payroll contributions to a civil service pension fund, and will further increase budget expenditures and the amount of money that the government must borrow and/or withdraw from the Petroleum Fund. The government already must decrease expenditures significantly in order to preserve the Petroleum Fund. Consequently, the new civil service pension program will further increase pressures on the budget.

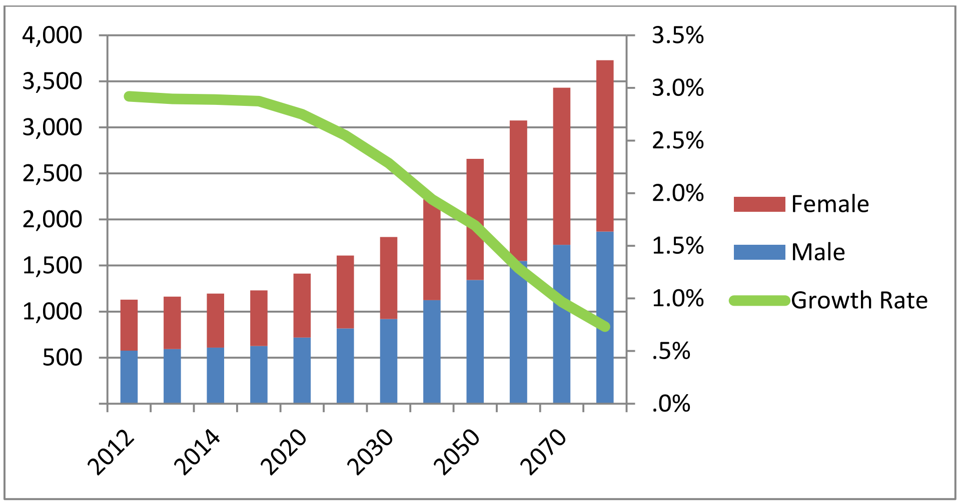
If the government decides to finance the program through payroll contributions, it will need to determine required contributions as a percent of covered payroll, and the portion of the total payroll contributions that will be paid by the government. The required payroll contributions may exceed plan expenditures, but depending on the pension plan's funding policy and how costs are shared between civil servants and the government, the burden on the State budget may be higher or lower than if the State pays all expenditures directly from the budget.

It is also important to look at the pattern of costs over an extended time period as a percent of GDP, percent of government expenditures and/or as a percent of covered payroll. This will help the government decide how best to finance the pension program. One important decision is whether a pension fund should be accumulated to help keep costs level over time by collecting more contributions than necessary in the early years of the program in order to accumulate assets to help cover costs in later years when contributions alone may be insufficient. The remainder of this section shows the detailed results of our analysis.

2.1. Population

The government of Timor-Leste has advised us that it expects the growth rate in the number of civil servants to be approximately equal to the growth rate of the population. Consequently, it is necessary to estimate the size and growth rate of the population as part of our projections. Population growth and composition also has a significant impact on the expected growth rate of GDP. The population of Timor-Leste is expected to grow rapidly, particularly between 2012 and 2030. Mortality rates are expected to decline throughout the analysis period. Although the fertility rate is expected to decline, it will remain near 5 children per mother until 2020 and over 3 through 2040. Figure 1 below shows the expected growth of the population and between now and 2080, based on the 2010 census and United Nations fertility and mortality projections.

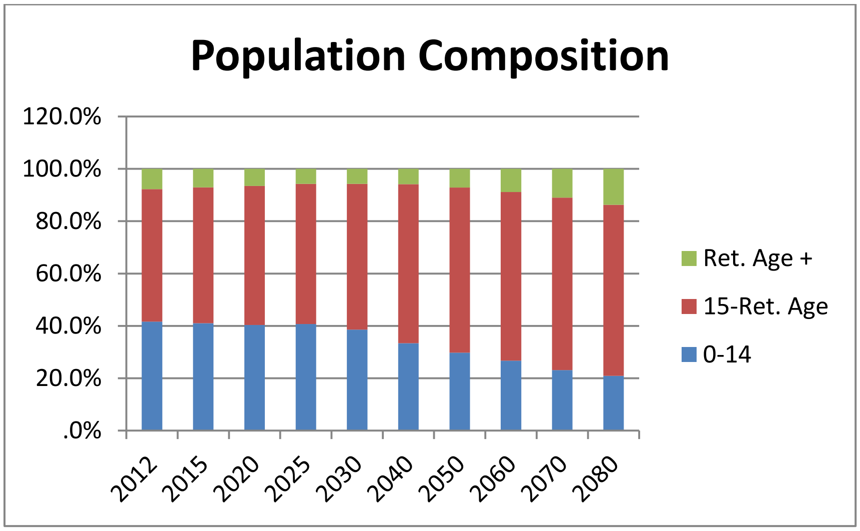
Figure 1: Timor-Leste Population (thousands) and Population Growth Rate



Source: Graph created by author from World Bank PROST model output

Figure 2 shows how the composition of the population changes over time. The number of children decreases significantly due to reducing fertility rates while the number of elderly grows due to declining mortality rates. Note that the assumed retirement age is increasing at several points throughout the projection period (see Table 8 later in this report) as the pension law stipulates that retirement ages should increase as life expectancy improves, and this increase reduces the percent of the population that is at or over retirement age in this graph.

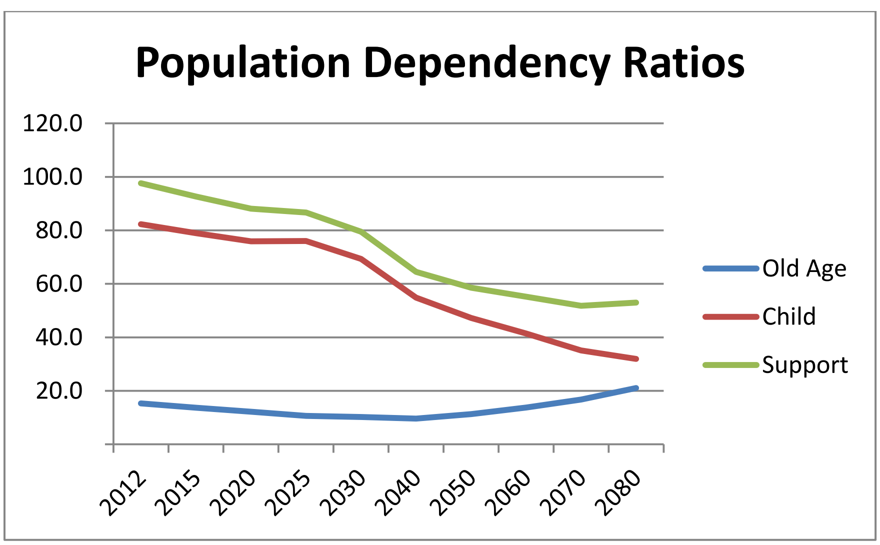
Figure 2: Population Composition



Source: Graph created by author from World Bank PROST model output

Finally, it is interesting to compare the number of citizens of working age with those who are either too young or too old to work. The ratio of citizens at or above pension age to the number of working age is often referred to as the elderly dependency ratio. The ratio of children to citizens of working age is the child dependency ratio. The support ratio is the number at or above pension age plus the number of children divided by the number of working age. The support ratio shows how many citizens are supported by each person who is working. Economic growth is likely to be higher when support ratios are low. Figure 2 shows these ratios for Timor-Leste.

Figure 3: Population Dependency and Support Ratios



Source: Graph created by author from World Bank PROST model output

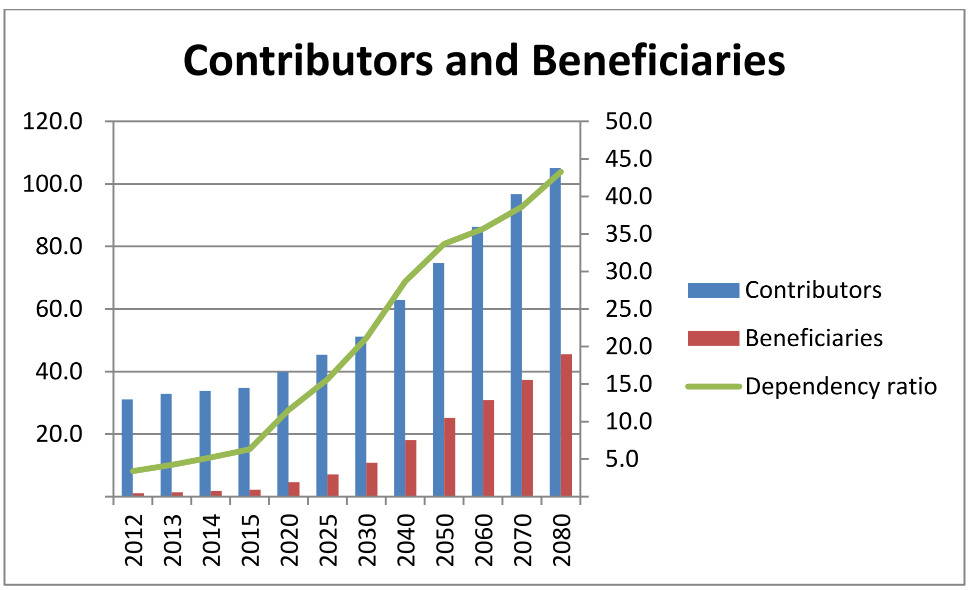
Note that while the elderly support ratio initially declines and then increases, the overall support ratio declines steadily throughout most of the analysis period due to the sharply reduced number of children. This means that over time Timor-Leste will enjoy a “demographic dividend.” A greater proportion of the Timorese population will be working in the future than today.

2.2. Contributors and Beneficiaries

In our analysis, we assumed the number of civil servants grows in proportion to the population throughout the analysis period. The starting number of pensioners determines the initial number of beneficiaries, while the assumed retirement ages, rates of disablement and rates of mortality determine the number of future beneficiaries.

In 2012, we assumed everyone age 60 or over retired immediately. Thereafter, everyone retires upon attaining age the minimum retirement age, which is 60 initially and increases to 64 by the end of the analysis period. Rates of disablement vary by age and sex and are used to determine the number of new disability retirees. A simplified assumption is used for the number of survivors. We assumed the number of survivors increases in proportion to the increase in the sum of the number of contributors plus the number of old age and disability pensioners. Figure 4 shows the number of contributors and beneficiaries and the plan dependency ratio on this basis. The plan dependency ratio is the ratio of the number of beneficiaries to the number of contributors. An increasing ratio indicates the number of beneficiaries is growing faster than the number of contributors and plan costs are highly likely to increase over time.

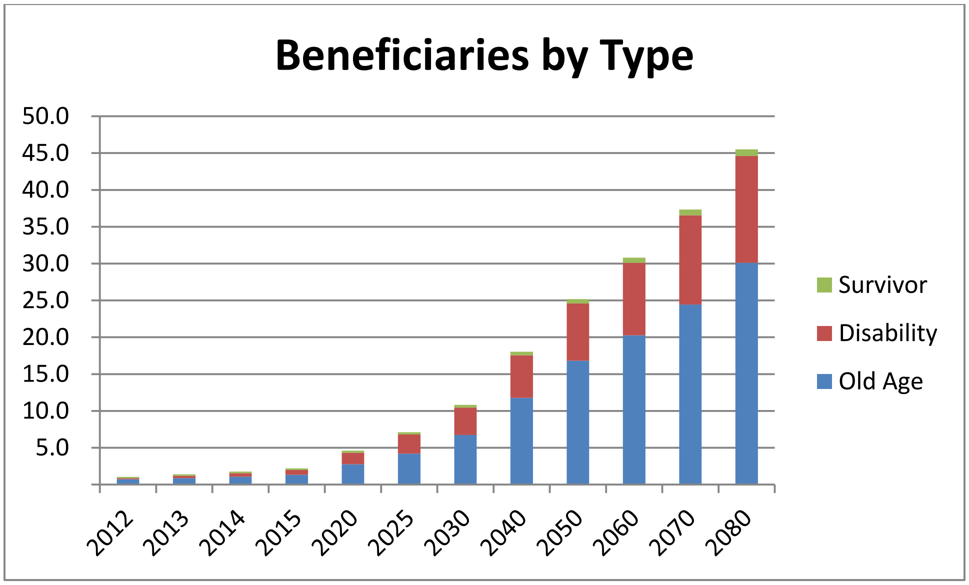
Figure 4: Contributors, Beneficiaries and Dependency Ratio



Source: Graph created by author from World Bank PROST model output

Figure 5 gives more detail regarding the number of beneficiaries. There are three types of beneficiaries under the civil service pension program – old age pensioners, disability pensioners and survivor pensioners.

Figure 5: Beneficiaries by Type of Pensioner

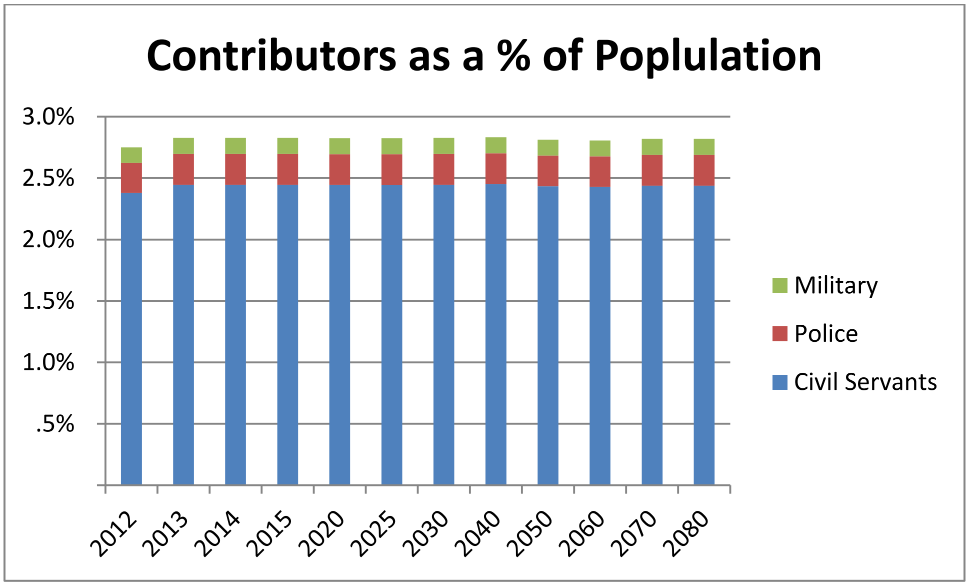


Source: Graph created by author from World Bank PROST model output

This Figure shows that old age pensioners are the majority of total pensioners, but the number of disability pensioners significantly increases over time while the number of survivors grows but remains a relatively small percentage of total beneficiaries. This is primarily because disability pensioners receive benefits for life while most survivors receive benefits for a much shorter time period, about 10 years on average.

Figure 6 shows the number of contributors as a percent of the population. This ratio in Timor-Leste is average compared to international norms. According to the World Bank report, "Timor-Leste Civil Service Review" dated June 15, 2011, the number of civil servants, excluding military and police, should be no more than 2.5% of the population and this is the approximate level today. Assuming the growth rate in the number of civil servants remains equal to or less than the population growth rate, the number of civil servants, excluding police and military, will remain less than 2.5% of the population.

Figure 6: Contributors as a % of Population



Source: Graph created by author from World Bank PROST model output

However, it is possible the number of civil servants will grow more rapidly. As Timor-Leste fully implements decentralization a larger civil service workforce will likely be needed to accommodate the increased needs and responsibilities of local government.

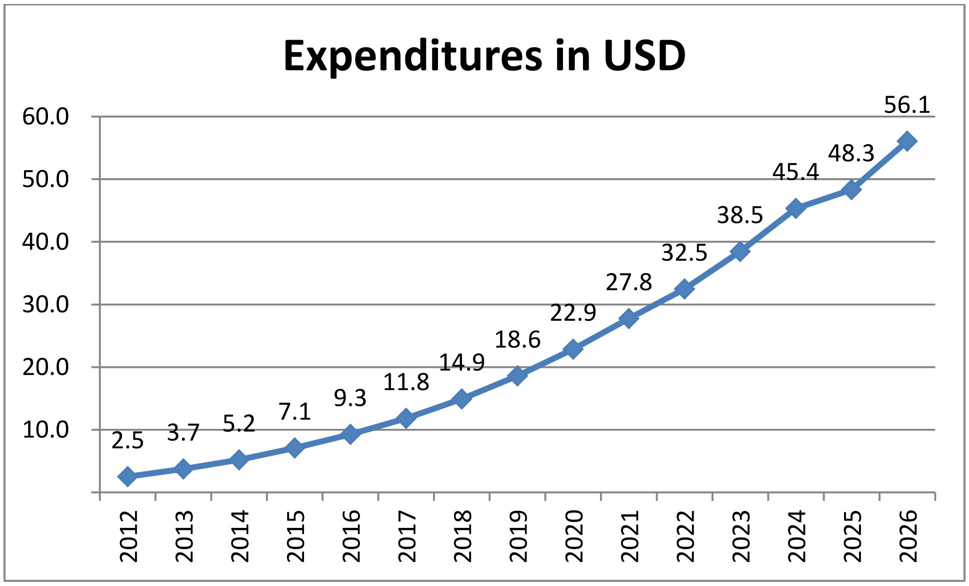
2.3. Expenditures

The primary purpose of this analysis is to estimate the total amount of expenditures in each future year for the civil service pension program. These expenditures will initially be paid from the State budget and will increase the total amount of public transfers, which will in turn increase total budget expenditures, and either the amount of excess withdrawals from the Petroleum Fund or the amount of government borrowing. However, for at least the next few years, the budget payments under the new pension program will remain a small proportion of total public transfers.

Expenditures are equal to expected benefit payments to all types of beneficiaries plus the administrative expenses of the program. Expenditures from 2012 through 2026 are of particular importance, since this is the period of time during which the country will benefit from continuing petroleum revenues. As was mentioned earlier in this report, the actual number of initial pensioners and their benefits will not be known until the application submission and approval and benefit calculation processes are complete. These figures will need to be revised once that process is completed. Figure 7 shows the estimated plan expenditures in millions of USD from 2012 through 2026. The amount in 2012 assumes benefits are paid for the entire year and should be prorated based on the actual plan start date.

For purposes of these projections, we assumed that pension benefits are indexed to the increase in the Consumer Price Index (CPI) each year. The pension law states that the government will periodically increase benefits based on increases in prices and wages in the economy. The usual international practice is to index benefits to price increases as wage indexing as too costly and without indexing, inflation will quickly erode the value of pension benefits.

Figure 7: Total Expenditures in Millions of USD

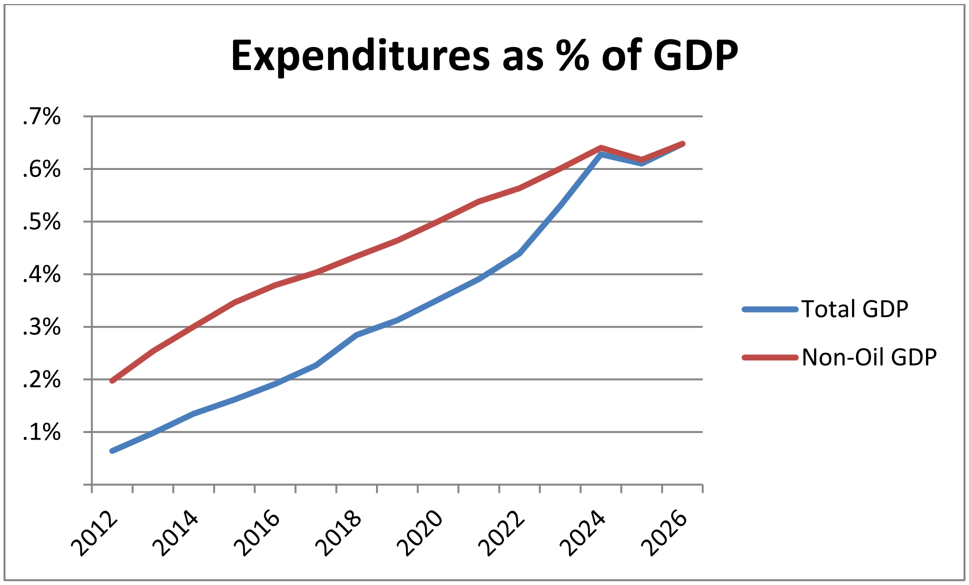


Source: Graph created by author from World Bank PROST model output

Another common way of expressing the total amount of expenditures for a civil service pension program is as a percentage of GDP or as a percent of sustainable government expenditures (domestic revenue plus ESI for Timor-Leste). It is difficult to estimate government expenditures from now through 2026 as so much will depend on the level of capital expenditures over the next few years and the amount of domestic economic growth produced by that investment. Sustainable government expenditures will also depend on the amount of excess withdrawals (withdrawals in excess of ESI) the government chooses to take from the Petroleum Fund. Consequently, we have focused on expenditures as a percent of GDP, which is easier to predict.

Figure 8 shows expected expenditures from the civil service pension program as a percent of non-oil and total GDP from 2012 through 2026. As can be seen, costs increase as a percent of GDP throughout the period. Real total GDP (non-oil plus oil) is only expected to *decrease* by 2.3% per year on average between 2012 and 2026. This is because oil revenue, and therefore oil GDP declines throughout the period. This offsets the large growth rate in non-oil GDP over this time period. Consequently, the new pension system will put an additional burden on the budget over the next 14 crucial years.

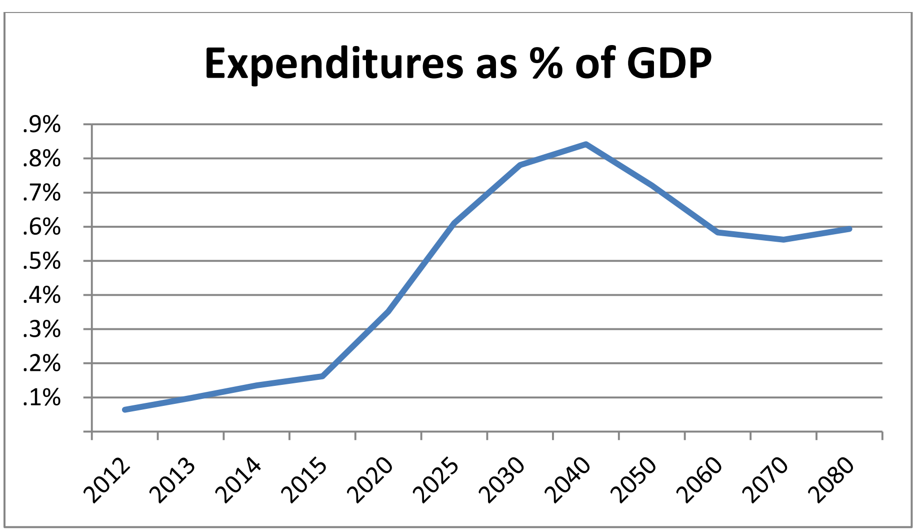
Figure 8: Expenditures as a Percent of GDP (2012 to 2026)



Source: Graph created by author from World Bank PROST model output

Figure 9 shows total projected expenditures as a percent of GDP from 2012 through 2080. This picture gives a somewhat different view. It shows that costs are expected to continue increasing as a percent of GDP until about 2040 and then decline and stabilize. This occurs because real GDP is assumed to continue growing rapidly while the growth rate in the civil service work force and the number of beneficiaries both slow.

Figure 9: Expenditures as a % of GDP (2012-2080)

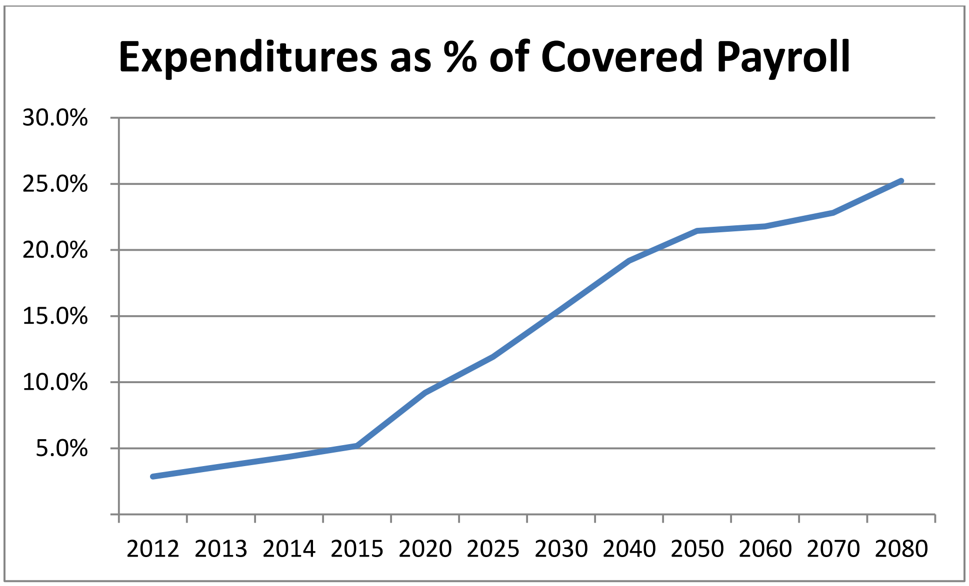


Source: Graph created by author from World Bank PROST model output

2.4. Payroll Contribution Financing

The government of Timor-Leste has indicated that they would like to rapidly switch the financing of the civil service pension program from State budget financing to payroll contribution financing. For this analysis, expenditures should be expressed as a percent of covered wages in each future year. As shown in Figure 10, total program expenditures as a percent of covered payroll, in contrast to expenditures as a percent of GDP, grows throughout the entire analysis period.

Figure 10: Pension Expenditures as % of Covered Payroll

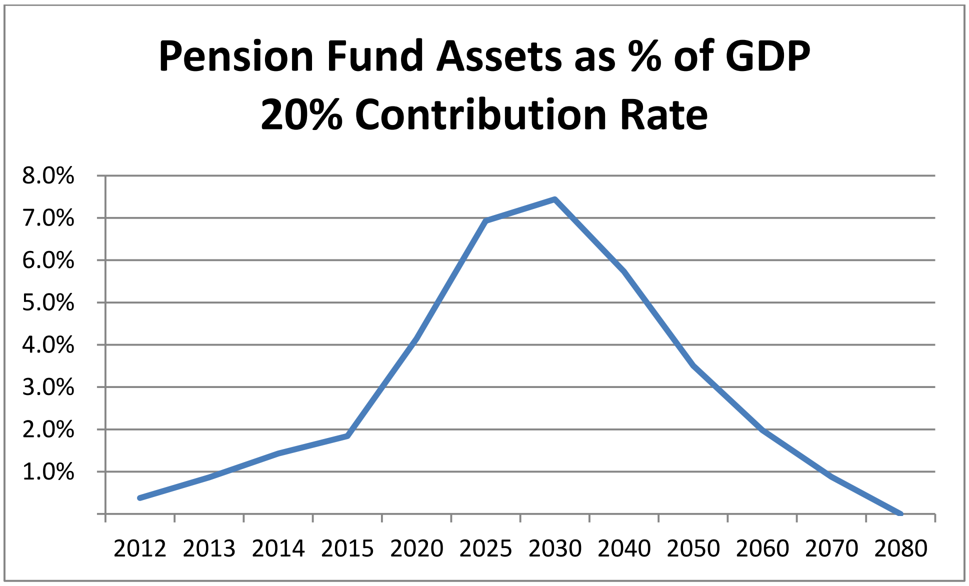


Source: Graph created by author from World Bank PROST model output

Since expenditures increase steadily as a percent of covered payroll, it means that the contribution rate will need to be increased each year in order to collect sufficient revenue to pay for all expected expenditures. The required contribution rate starts out at just 2.9% of payroll in 2012, but increases to 25.4% of covered payroll by 2080. This is caused by the sharp increase in the pension plan's dependency ratio. The number of beneficiaries and total pension payments grows more rapidly than the number of contributors and their total base wages throughout the analysis period.

The level required payroll contribution to fully finance all expected expenditures over the entire period from 2012 to 2080 is equal to 20.1%. This means if 20.1% of payroll was collected from civil servants and the government combined, it would be sufficient, together with expected investment income, to pay all plan expenses when due from now through 2080. However, if this amount was collected each year, it would be far more than needed in the early years of the program and less than is needed in the later years of the program. The excess contributions collected in the early years would have to be saved and invested in a pension fund so that the fund could be used to help pay expenditures in later years when collected contributions alone are expected to be insufficient. The required contribution rate as a percent of payroll is less than 20% through 2043 and more than 20% thereafter. The size of the asset accumulation in the pension fund with a contribution rate of 20% of covered payroll is shown in Figure 11.

Figure 11: Pension Fund Assets as % of GDP with 20% Payroll Contribution Rate

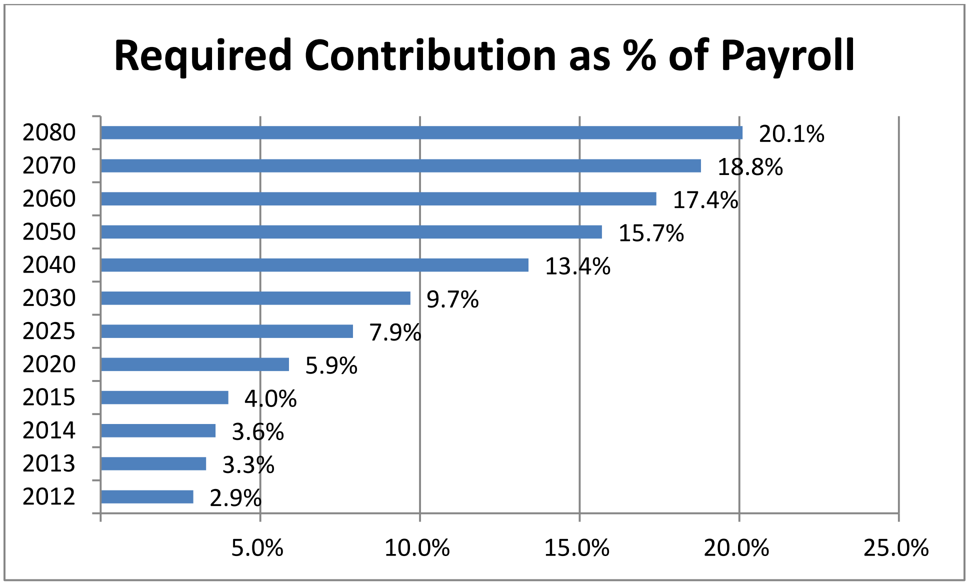


Source: Graph created by author from World Bank PROST model output

As can be seen, the amount of assets in the pension fund would accumulate to more than 7% of GDP by 2030 and then would be steadily liquidated thereafter. This amount of money would need to be properly protected and managed in order to assure benefits could be paid to civil servants when due. The government may not wish to accumulate such a large amount of funds, as it would overwhelm the size of local capital markets and would force the government to invest most if not all of the contributions overseas as it currently does with the Petroleum Fund. On the other hand, the Petroleum Fund experience should help Timor-Leste properly manage such a pension fund.

It should be noted that there are many different funding options available to the government of Timor-Leste other than charging 20.1% of payroll from the start. For example, it could set contribution rates at a lower initial level and then increase them periodically. Figure 12 shows the level required contribution rates over varying time periods in order to fully fund the program through that date. For example, if the government wanted to keep the contribution rate level from now through 2030, the required contribution rate would be 9.7%. Of course, the contribution rate thereafter would be significantly higher and the ultimate contribution rate would exceed 20.1%. There are an infinite number of possible contribution patterns that the government could follow, each with their own contribution and asset accumulation patterns.

Figure 12: Required Level Payroll Contributions over Varying Time Periods



Source: Graph created by author from World Bank PROST model output

The next few sections of this report summarize the input data and assumptions that were used to generate these results.

III. Input Data

3.1 Active civil servants

Information regarding active civil servants and their wages was provided to us by the Ministry of Finance and the Civil Service Commission. The Ministry of Finance gave us a seriatim data file while the Civil Service Commission gave us grouped data by age and sex. Information from the Ministry of Finance included active civil servants, military and police; Civil Service Commission data excluded military and police. There were slight differences between the two files because they were prepared about one month apart. Additional information was also available from the government's 2012 budget.

The Civil Service Commission data is considered to be the best primary source and was used for all civil servants except military and police. Ministry of Finance data was used for these two groups. These data file were prepared in early 2012. After discussion with the Civil Service Commission, the average base salary information for civil servants was taken from the State budget for 2012. Payroll information for civil servants from the 2012 State budget is shown in Table 1.

Table 1: Total Payroll for Civil Servants in 2012 Budget

	2012	Percent
Base Pay	127,064,555	90.7%
Overtime	1,796,331	1.3%
Allowances	11,210,000	8.0%
Total	140,072,898	

Source: State Budget for 2012

If total payroll for 2012 from Table 1 is divided by the head count from the budget books of 41,048, then the average total wage in 2012 is equal to 262.49 per month, assuming 13 payments per year, and average base pay in 2012 is 238.12. We used base pay in our model, as that is the basis for pension calculations. Please note that the head count in the budget is not considered a realistic measure of the number of civil servants for 2012 and was not used in our analysis.

In addition to the average wage, it is also important to know the variation in wages by age and sex. Those who are older generally have higher salaries and salaries at retirement age are important for benefit calculations. The civil service and Ministry of Finance data was sufficiently detailed to allow us to develop a scale of average wages by age and sex.

Table 2 below shows the number of active participants included in the data files we received from the Ministry of Finance and Civil Service Commission that were used as the basis for our calculations.

Table 2: Active Participant Head Counts

Group	Count
Police	3,232
Military	1,510
Civil servants	27,190
Total	31,932

Source: CSC and MoF

The total count of 31, 932 includes workers age 60 and over, some of whom will retire as soon as the civil service pension scheme begins and some workers who are below age 60 and disabled and will receive disability pensions as soon as the pension scheme begins. We removed these workers from the active count and treated them as pensioners at the start of the new system. More detail regarding the determination of the number of initial pensioners and their benefits is discussed in the next sub-section of this report. Table 3 shows the number of active participants and their wages on the plan start date after adjusting for the initial pensioners.

Table 3: Active Participants and Wage Bill on Plan Start Date

	Count	Total Annual Wage Bill	Average Wage
Male	23,066	65,962,662	238
Female	8,006	21,692,204	226
Total	31,072	87,654,865	235

Source: CSC and MoF, with author's adjustments for initial retirements

In the model, it is necessary to make assumptions about the growth rate of the civil service and about the distribution of new entrants by age and sex. Based on discussions with the Civil Service Commission, we assumed the number of civil servants will grow in proportion to the growth rate of the population. This means the number of civil servants remains a constant percentage of the population throughout the projection period. For 2013, we applied the increase percentage to the active count prior to removal of expected old age and disability retirements. We assumed these positions would be replaced.

We did not have data for Timor-Leste regarding the age/sex distribution of new entrants to the civil service. Consequently, we used the age/sex distribution of new entrants from the Indonesian civil service system which has an average age at hire of 28. The Civil Service Commission confirmed that this was a reasonable assumption for new civil servants in Timor-Leste as well. Based on discussions with the Civil Service Commission, we assumed the sex composition of new entrants would be 65% male and 35% female, which is significantly different than in Indonesia.

3.2 Data – Pensioners

Although the pension system should have begun operations on 1 June 2012, the government of Timor-Leste is not yet fully prepared to start the new system. The benefit application process has not yet been completed, so the initial number of old age, disability and survivor pensioners and their benefits is not yet known.

As previously note, the total active count of 31, 932 includes workers age 60 and over, some of whom will retire as soon as the civil service pension scheme begins, and some workers who are below age 60 and disabled that will receive disability pensions as soon as the pension scheme begins. Unfortunately, it is difficult to estimate the actual number of pensioners at the start of the new system. There is no mandatory retirement age for civil servants, so some of those 60 and over may continue to work and draw a salary rather than retiring. Also, the number of potential disability pensioners is not known.

In addition, there will be some number of survivor pensioners at the start of the new system. These are beneficiaries of civil servants who died between 20 May 2002 and the start date of the new pension scheme. Different types of beneficiaries are entitled to very different benefits, so it is difficult to know how many survivor pensioners there will be and for what length of time the benefits will be payable. Consequently, until the actual benefit applications are submitted and approved, it is difficult to know how many initial pensioners there will be. This model will need to be revised once the actual counts and benefit amounts are available.

Given these uncertainties, for purposes of this valuation, we made the following assumptions:

- Old age pensioners: All active civil servants age 60 and older retire on the system start date
- Disability: The initial number and age/sex composition of disability pensioners will be the same as the expected number and composition of new disabilities in the first full year of the new system
- Survivor: The initial number of survivors will be equal to the expected number of active and inactive deaths in the first full year of the new system.

For old age pensioners, our assumption is conservative since we assume everyone age 60 and older will retire while it is likely that some civil servants age 60 and older will choose to continue working. The number of disability and survivor pensioners cannot be accurately estimated. Based on anecdotal evidence only, we believe the number of disability and survivor pensioners using our procedures is probably somewhat overstated.

The number of survivor pensioners in our analysis is equal to the expected number of monthly payments that are expected and not the total number of beneficiaries to whom those payments apply. For example, assume an active worker dies and has a spouse and three children under the age of 17. A single check equal to 100% of salary at time of death will be paid to the family from the participant's date of death until the last child attains age 17. In our analysis, we have treated this as one survivor beneficiary and not as four beneficiaries.

The pension amount is based on the benefit formula in the law and the assumed average wage at retirement. Based on discussions with the government, we believe historical pay and service records may be lacking for many civil servants. Therefore, it may be difficult to accurately calculate average base earnings in accordance with the formula in the law for the initial pensioners. Consequently, we assumed the average wage calculation would be phased in prospectively. Those retiring on the plan start date will have benefits calculated based on pay just prior to retirement only, the next year's pensioners will have benefits based on pay averaged over the last two years of their career and continuing in this manner until average base pay is based on all years of service.

Applying these procedures, the estimated number of pensioners and the benefits in pay status at the start of the new system are shown in Table 4.

Table 4: Number and Amount of Initial Pensions

	Count	Annual Payments	Average Monthly Payment
Old Age Pensioners			
Male	551	1,334,971	202
Female	158	391,598	207
Total	709	1,726,569	203
Disability Pensioners			
Male	117	259,876	185
Female	38	83,297	181
Total	155	343,173	184
Survivors	190	365,400	160
Grand Total	1,054	2,435,142	192

Source: Author's estimates

We expect annual pension payments at the start of the system to be 2.4 million USD per year or 203,000 USD per month. Since pension payments in 2012 will start from 1 June only, the total expected payments for 2012 is about 1.4 million USD.

IV. Computer Model and Assumptions

This section describes the various assumptions that we made in order to prepare the short and long-term financial projections for the civil service pension program.

4.1 Computer Model (PROST Model)

Projection models are an essential tool to analyze new and existing pension systems, systematically evaluate their financial status and examine policy reform options. Since the fiscal costs and benefit effects of pension systems are only realized over long periods of time, it is essential to employ use an actuarial model which systematically projects these effects over multiple generations. The analytical basis for the review of the new civil service pension scheme in this report was the use of projections prepared using version 14 of the World Bank's Pension Reform Options Simulation Toolkit (PROST) model. This model contains six input spreadsheets for inputting data, assumptions and pension program benefits. The model then produces a wide variety of output reports, graphs and charts. The World Bank maintains a dedicated team of programmers and user groups that constantly work together to maintain and update this software and provide quality assurance. Version 14 is the most recent version of this model.

4.2 Demographic Assumptions

Information on the population by age and sex in 2012 was based on the 2010 census brought forward using the PROST model to 2012. United Nations data was used for assumed mortality rates, mortality improvement and fertility. Data was available in five-year age increments from 2010 through 2080. The UN data anticipates a slow decline in fertility rates and a significant decline in mortality rates over the 70 year period. Table 5 shows the expected fertility rates in selected years. Fertility rates are the number of children that a mother is expected to have during her lifetime.

Table 5: Fertility Rates

Year	Rate
2010	5.92
2030	3.73
2050	2.56
2070	2.06

Source: United Nations, 2010

The expected decline in mortality rates will have a significant impact on the period of time for which pensions will be paid. Assuming a retirement age of 60, Table 6 shows life expectancy for males and females for selected years.

Table 6: Life Expectancy at Age 60

Year	Males	Females
2010	15.3	16.8
2030	16.6	18.5
2050	18.0	21.0
2070	19.6	23.1

Source: United Nations 2010, and author's calculations using World Bank's PROST model

4.3 Macroeconomic Assumptions

Timor-Leste has an unusual macroeconomic environment. It is in the early stages of a transition from an oil-based to a non-oil based economy. New oil revenues are expected through 2025 only and revenues are generally expected to decline from one year to the next. In 2012, the projections of Timor-Leste's future oil revenues were reduced and the expenses of recovering that oil were increased, resulting in a significant decrease in the present value of expected future oil revenue.

The government of Timor-Leste has accumulated excess past oil revenues (those oil revenues not used to support budget expenditures) in a Petroleum Fund. The government has a formula for calculating the amount that can be withdrawn from the Petroleum Fund each year – referred to as the ESI or Estimated Sustainable Income – that will allow the Petroleum Fund to continue indefinitely. The ESI is part of the planned budget revenue for each year.

However, in recent years the government has chosen to take excess withdrawals – withdrawals in excess of the ESI – from the Petroleum Fund to support high levels of capital expenditures to develop needed infrastructure for the non-oil economy. If this pattern of high excess withdrawals continues, it is likely the Petroleum Fund will be exhausted rapidly once new oil revenues cease. To preserve the Petroleum Fund, the government will need to hold level or reduce nominal recurring expenditures, and will need to sharply reduce capital expenditures after 2016. Recurring expenditures include salaries and wages for civil servants, goods and services and public transfers. The payments from the budget to civil servants under this pension program will further increase already high public transfers.

The key macroeconomic variables for the pension fund projections are the inflation rate, growth rate of real non-oil GDP, projected oil revenues, the growth rate of real wages and the growth rate of the number of civil servants. The macroeconomic unit of the Ministry of Finance gave us inflation and GDP estimates from 2012 through 2050. The real wage growth assumption is based on discussions with the Civil Service Commission. These variables from 2012 through 2026 are shown in Table 7 and from 2012 through 2080 are shown in Table 7a.

Table 7: GDP, Inflation and Wage Growth (2012 – 2026)

	2012	2013	2014	2015	2016	2017	2018	2019
Non-oil GDP excl UN (nominal)	1,272.3	1,476.9	1,727.4	2,047.3	2,443.4	2,929.9	3,437.8	4,007.6
Oil GDP (150% of oil revenue)	2,648.7	2,346.9	2,115.6	2,334.9	2,394.9	2,281.5	1,810.5	1,942.5
Total GDP	3,921.0	3,823.8	3,843.0	4,382.2	4,838.3	5,211.4	5,248.3	5,950.1
Inflation	11.7%	7.6%	7.7%	7.7%	7.7%	7.7%	6.0%	6.0%
Non-oil GDP growth (real)	10.0%	10.0%	9.8%	11.4%	12.1%	12.8%	12.1%	10.9%
Total GDP growth rate (real)	-28.1%	-9.4%	-6.7%	5.9%	2.5%	0.0%	-5.0%	7.0%
Wage increase (real)	3.5%	3.5%	3.5%	3.5%	3.5%	2.5%	2.5%	2.5%
Growth rate of civil servants	2.9%	2.9%	2.9%	2.9%	2.8%	2.8%	2.8%	2.8%

	2020	2021	2022	2023	2024	2025	2026
Non-oil GDP excl UN (nominal)	4,575.5	5,156.3	5,763.3	6,402.9	7,082.2	7,829.0	8,654.2
Petroleum Revenues (oil GDP)	1,938.0	1,945.5	1,627.5	858.0	141.0	91.5	-
Total GDP	6,513.5	7,101.8	7,390.8	7,260.9	7,223.2	7,920.5	8,654.2
Inflation	5.7%	5.3%	5.0%	4.7%	4.3%	4.3%	4.3%
Non-oil GDP growth (real)	9.0%	7.5%	6.8%	6.3%	6.0%	5.8%	5.7%
Total GDP growth rate (real)	3.6%	3.5%	-0.9%	-6.1%	-4.6%	5.1%	4.7%
Wage increase (real)	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Growth rate of civil servants	2.8%	2.7%	2.7%	2.6%	2.6%	2.5%	2.5%

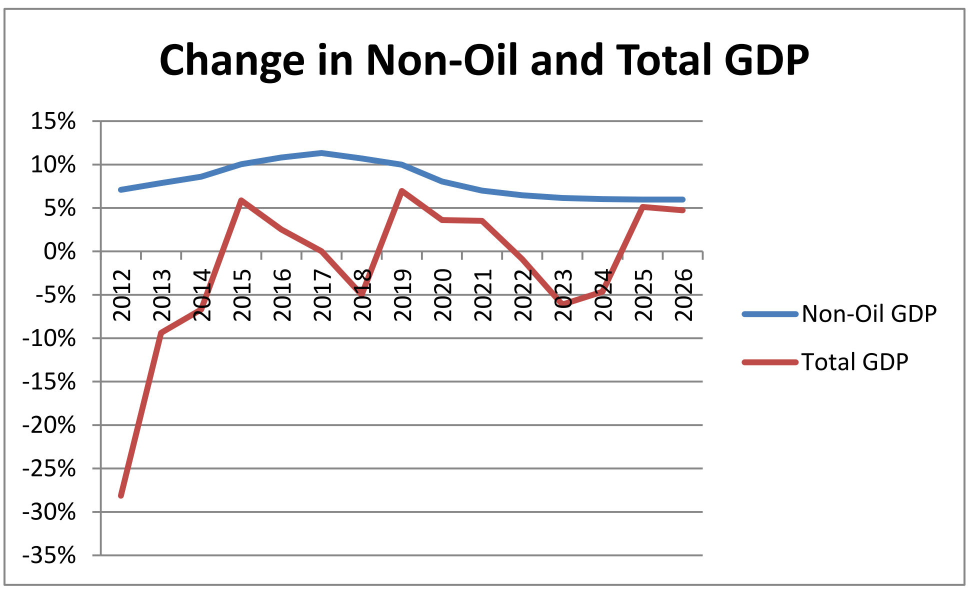
Source: Macroeconomic Directorate of MoF, CSC for real wage increase

7a: GDP, Inflation and Wage Growth (2012 – 2080)

	2012	2020	2030	2040	2050	2060	2070	2080
Non-oil GDP excl UN (nominal)	1,272.3	4,575.5	12,863.0	33,520.8	98,367.2	271,638.9	629,494.2	1,357,567.0
Oil GDP (150% of oil revenue)	2,648.7	1,938.0	-	-	-	-	-	-
Total GDP	3,921.0	6,513.5	12,863.0	33,520.8	98,367.2	271,638.9	629,494.2	1,357,567.0
Inflation	11.7%	5.7%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Non-oil GDP growth (real)	10.0%	9.0%	5.9%	6.2%	7.8%	5.3%	4.0%	3.7%
Total GDP growth rate (real)	-28.1%	3.6%	5.9%	6.2%	7.8%	5.3%	4.0%	3.7%
Wage increase (real)	3.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Growth rate of civil servants	2.9%	2.8%	2.3%	1.9%	1.7%	1.3%	1.0%	.7%

GDP projections for the next 15 years are a combination of small but rapidly growing non-oil GDP combined with declining oil GDP. The net result is an erratic total GDP that varies from positive to negative and averages *negative* 2.3% real per year from 2012 to 2026 despite a 10-13% real growth rate in non-oil GDP from 2012 through 2019. Figure 13 compares the rates of increase of non-oil and total GDP from 2012 through 2026.

Figure 13: Real Growth Rate of Non-Oil and Total GDP (2012-2026)



Inflation exceeded 11% in 2011 and is currently in estimated to be 11.7% in 2012. Thereafter, the projections from the macroeconomic unit of the Ministry of Finance show quickly declining future inflation rates. Since pension benefits are assumed to be indexed to inflation, the rate of inflation has a material impact on the expenditures of the pension program in USD. Inflation is also a component of both nominal GDP and wage increases. This variable will need to be carefully tracked and results will need to be adjusted if inflation remains in double digits.

Real wage growth together with inflation determines the rate of increase of civil servant wages. This impacts pension benefits payable to civil servants, expected expenditures on a pay-as-you-go basis and required payroll contributions on a funded basis. The real rate of increase in wages should reflect productivity improvements in the civil service and the economy, the mix of skill sets needed by government and competition for skilled labor.

The assumed growth rate of real wages was set to 2.5% per year throughout the analysis period with the exception of 2012 through 2016 when it was set at 3.5%. This assumption was set in consultation with the Civil Service Commission. Civil servants have not had an increase in pay since 2009 when the pay structure was revised. This revision primarily benefited those in higher positions. Meanwhile, inflation has average about 12% per year since that time. Consequently, a catch-up increase is needed. We were also told that the government is also trying to fill many senior positions and there is a big shortage of qualified candidates. Those with the necessary skills have many other opportunities. The expectation is that many senior positions will be filled in the next few years and salaries for those positions will be higher than planned.

4.4 Decrement Assumptions

Retirement Age: Workers are assumed to retire at the minimum retirement age, which is age 60 at the start of the program. The minimum retirement age is then assumed to increase in proportion to the increase in life expectancies. This is in accordance with the pension law. Table 8 shows the assumed retirement ages used in the model. Note the correspondence with the increases in life expectancy shown in Table 6.

Table 8: Assumed Retirement Ages

Retirement Age	Years
60	2010-2024
61	2025-2039
62	2040-2054
63	2055-2069
64	2070-2080

Source: Author's assumptions

We may need to modify this assumption if actual experience shows that civil servants often voluntarily choose to continue working beyond the minimum retirement age or if Timor-Leste adopts a mandatory retirement age.

Rate of Disablement: Rates of total and permanent disability were taken from the 2009 experience of the American Social Security system, for lack of a better source of data. This can be adjusted as actual experience emerges. On the one hand, rates of disablement can be expected to be higher in Timor-Leste than in America. On the other hand, the pension program only covers civil servants at the moment, and their rates of disability should be less than for the population as a whole.

We also compared results using these rates with disability incidence experience from Eastern Europe and Latin America. Using the American Social Security rates, about 0.5% of the covered population is expected to become disabled each year. Incidence rates in Latin America have been about 0.9%. Studies done by the author for mature pension systems in Armenia and Macedonia showed incidence rates of 0.4% and 0.7% respectively. Consequently, we believe these disablement rates are reasonable.

Mortality rates: Mortality rates and rates of mortality improvement were based on 2010 data from the United Nations. These tables show rapid expected improvement in mortality in Timor-Leste – about 2% per year at working ages and 1% per year at post-retirement ages. This is about double the rate of improvement in developed countries like the United States.

V. Pension Design Comments

The design of the civil service pension program does not follow international standards in several respects. The key non-standard design issues are:

- 75% of final average base pay is a rich benefit, particularly for a country that needs to constrain civil servant salaries and benefits and needs to restructure public transfers. However, if base pay becomes a small percentage of total pay in the future, it is possible this apparently high benefit could become insufficient
- The 75% benefit is paid to everyone with 5 or more years of service (this will increase to 9 years of service by 2015). It doesn't vary with years of service. Normally, the formula is a specified percent of final average pay for each year of service. For example, Indonesia is 2.5% of final base pay for each year of service. Someone with 10 years of service receives 25% of final base pay while someone with 30 years receives 75%
- The survivor benefit has an unusual design. The benefit for the spouse can vary from as little as one year to life depending on the spouse's age when the civil servant dies; the benefit amount does not vary depending on the number of children and the benefit payment period depends only on the age of the youngest child. The benefit also does not reduce as each child attains age 17
- Benefits will be paid to those who became disabled prior to enactment of the pension law and after independence. Benefits will also be paid to survivors of civil servants who died prior to enactment of the pension law.

An argument could be made that the 75% benefit payable without regard to years of service, is not that important for Timor-Leste's civil service program since almost all civil servants join the civil service at a young age and remain for their entire career. Consequently, almost all civil servants have long careers anyhow. The argument is also made that this is necessary in order to pay meaningful benefits to those who are already close to or over age 60.

The usual method for taking care of workers who are old when a system is established is to vary benefits with years of participation in the plan but give all active workers service credit for years of service prior to plan establishment. For Timor-Leste, this could include years following independence, years during the Indonesian era and service during the Portuguese colonial period. This would allow payment of higher benefits to civil servants with long service without promising high benefits with short service to younger civil servants and future hires.

Another argument that is made is that this is a transition pension scheme and the provisions will be changed in the near future. The concern with this approach is that Timor-Leste may have already created rights for all existing civil servants that cannot be taken away by amendment. In some countries, the existing formula applies to all current workers when the pension plan provisions are changed and only new workers are subject to the new provisions. This will require careful legal examination by appropriate government officials.

This provision would be even more problematic if the same formula was extended to the entire formal sector. It would give high benefits to formal sector workers for very short service and could encourage formal sector workers to move to the informal sector after meeting the minimum service requirement to receive a pension under the national social security system. This could allow them to receive the full benefit while avoiding contributions for the remaining years of their career. Even for civil servants, if the government wants a more open civil service in the future, with fluid movement between civil service and the formal sector, this design would be inappropriate.

VI. Conclusion and Next Steps

The results of our analysis are somewhat surprisingly. Timor-Leste is a very young country with a rapidly increasing population, so it would seem logical that the pension fund's finances would be more stable as a percent of GDP or payroll than our analysis indicates. The financing complexities from the civil service pension program come from a variety of sources:

- There are many older members of the civil service, disabled members and survivors of civil servants who died between 2002 and 2011 who will retire immediately when the pension program begins
- The size of the civil service will continue to increase rapidly, particularly in the early years of the program when population growth rates remain near 3% and real wage increases are higher than in later years
- The number of beneficiaries is increasing more rapidly than the number of contributors, so the pension plan dependency ratio is increasing
- Benefits are generous, providing 75% of indexed career average base pay for everyone with 60 or more months of service
- While non-oil GDP is expected to grow rapidly over the next 15 years due to the government's investment in infrastructure and capital, oil GDP is declining as oil fields become depleted and the cost of extracting the remaining oil increases.

In the next few years, the government will need to make difficult decisions about how to manage its recurring expenditures – including civil servant salaries and wages, salaries of outside consultants, amounts spent on existing public transfer programs and the transfers from the new civil service pension program. It will also need to decide how to manage its investments in capital and infrastructure while keeping the Petroleum Fund fiscally sustainable. The civil servant pension program will be yet one more significant challenge to be managed.

Now that the government has enacted the civil servant pension legislation and estimated the likely cost of the program, the next step is to create the necessary governance, administrative and financial framework to manage the new program. This will require the following major activities:

- Socialization: Information on plan provisions, participant rights and obligations, methods of applying for benefits, availability of retirement planning and counseling services
- Application process: Application, documents to submit with application, review and approval/rejection process, calculation of benefits, appeals process
- Establish MIS systems: Capture past and future pay, service and position information needed for determining eligibility and calculating benefits, purchase of hardware, purchase or development of software
- Payment process: Set up a structure for making monthly pension payments to beneficiaries and stopping payments when eligibility ceases. Organization is responsible for paying benefits, benefit payment information and authorization, payment distribution
- Reporting and disclosure: Reports to plan participants, the government and Parliament,
- Financial management: Accounting and financial statement preparation
- Legal management: Plan interpretation, issue regulations, receive and respond to complaints, legal actions by and against the pension plan.

This will require preparation of a detailed roadmap for program implementation, clear accountability for all activities, close interface among government Ministries and other relevant stakeholders and assistance from development partners. We look forward to working with the government of Timor-Leste and other development partners to assist the government with implementation of this important new program that will ultimately lead to a national social security system covering all Timorese workers.