Managing The Risk Associated With Income Smoothening Through Social Insurance in small states: Some Lessons From Trinidad And Tobago.

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Abstract

This paper analyses some risks associated with income smoothening in the small island state of Trinidad and Tobago. The paper reviews the literature on social security financing and the channels through which risks would impact on the ability of social insurance scheme to fulfill the promise of income smoothening through its pension system.

This scenario is likely to change under different assumptions. This paper is based on the most recently available information on the changing demographic and economic characteristics and attempts to paint a realistic picture of the confidence which one should place on the pension promise.

Introduction

The paper represents an attempt to put the issue of social protection for the aged higher on the regional development agenda. This may not be a difficult task if we consider the following:

1) Retirement income protection systems are among the largest institutional savers in the region and may exert very strong influences on capital market development (where Bodie and Davis 2000, for instance, observed that the growth of pension funds is heightening the competition among institutions in the field of asset management) and labour market issues.
2) The growth in pension funds created and controlled by employers is making pension funding a crucial aspect of corporate finance.
3) Demographic aging of the population is putting a tremendous amount stress on pay as you go schemes in the region.
4) Because of urbanization there is a breakdown in some of the systems that traditionally cared for the aged such as the institution of the extended family, as such, pension income has become a very important income stream for the age (ILO 1999)

The Problem outlined

The issue of income smoothening is an issue of the inter-temporal transfer of income from one time to the next and forms part of a broader goal of social protection for the aged (Robert Holzman 2001 World Bank). The issue of the inter-temporal transfer of

consumption has been tackled by many authors. (Samuelson 1958; Harold 1956;Bohm-Bawerk; Aaron 1966; Feldstein 1972). The paper by Samuelson (1958) in many ways was regarded s seminal. The central challenge which he identified was to find a mechanism by which someone can transfer the products that he produces during his working life to himself when he retires. If one consumes all of his products during his working life and saves zero then in retirement he/she would either consume zero or consume an amount that depend entirely on the products and goodwill of someone else. In this case, if an 'I am brother's keeper' philosophy does not prevail and such an arrangement cannot be negotiated then a fatality would occur soon after retirement. This clearly is not an ethically optimal solution.

If goods were kept perfectly in nature, then current products can be traded with nature in return for future consumption goods at least on a one to one basis. In this case the value of a good would be held constant through time with zero interest rate. If however, like Samuelson (1956) we assume that nothings would be kept at all, then we would conclude that no inter-temporal trade with nature is possible and that some other means of transferring products for oneself through time when one is no longer able to work has to be found.

With money as a store of wealth, Samuelson (1956) agrees might be the only thing that gives workers in one period a claim over products of workers in a next era even though he argues no real 'quid pro quo' exist. However, because money itself, as a measuring rod, changes with movements in average prices, it means that money is not a perfect substitute through time. Thus the amount of surplus products converted into money, and put aside

for a later time (know as savings) would not necessarily buy the same amount of products at some future time. It is this issue of changes in the value of money itself from one period to next which exposes the elderly to a number of risk factors which must be considered in the designing of a pension system.

This next issue is should it be left up to private individuals to provide retirement income for themselves or is there a case for government intervention in the provision of retirement pension. The answer to this question would revolve around a discussion of the rate of product transformation (i) from one period to another that would be obtained under the two regimes.

The following are the reasons for government involvement in the provision of retirement income for the elderly: market failure, informational inefficiency, adverse selection and moral hazard.

Market Failure

To the extent that we have to save, Samuelson (1956) demonstrated with consumption–loan model of interest, that if the future price of what one gives up is left to be determined my free competitive market forces, then the rate at which products in the future would have to be discounted would be greater than one(1) implying a negative interest rate.[1] He demonstrated the dramatic results by using a three period life cycle model that an

[1] The discount rate is given by $R = {}^{1}\!/\!_{(1+i)}$ where i = rate of interest which is simply the marginal rate of transformation between present and future goods. For values of i between zero and infinity R would be less than one. If R is $\succ$ than one it must be that i is negative.

individual's savings would lose about two thirds of their principal value in two periods. Samuelson(1956) decisively showed the where the population is stationary that the social optimum where the discount rate (R) of one and by inference where the interest rate is equal to zero can never be reached by competitive market forces where everyone insists on a 'quid pro quo' (for trade to be mutually beneficial) and there is voluntary action. Samuelson also demonstrated the theorem that 'every geometrically growing consumption-loan economy has an equilibrium market rate of interest that is exactly equal to its biological percentage growth' and that the competitive market rate will be less than the biologically optimality rate (m).[2]

Samuelson (1956) proposed that if each man enters into a social contract 'in which the young are assured of their retirement subsistence if they will today support the aged, such support to be guaranteed by a draft on the yet-unborn' then social optimum, where everyone is better off, can be achieved.

Can this social contact be on a voluntary basis. A lot has been written on the problems associated with voluntary action. Firstly there are the problems associated with **informational inefficiencies** where an individual would not normally know his lifespan and therefore his/her optimal saving rate. With voluntary action there are also the well know problems of adverse selection (where there are income differential and individuals may want and limit cross subsidization) and moral hazard or free rider.

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[2] Biologically optimal rate (R) is equal to $1/(1+m)$ where m is equal to population growth rate. (Samuelson 1956 illustrated that i=m.is a possible solution making the discount rate a function of population growth.

The rate of interest on savings where this type of social contact exists, will be a function of population growth (see footnote 2) and would be greater than if individuals save for themselves (Aaron 1966). Aaron (1966) also demonstrated the theorem which he called the 'social insurance paradox' that 'social insurance can increase the welfare of each person if the sum of the rates of growth of population (m) and real wages (h)exceeds the rate of interest' ie

$$.i < m + h$$

He argues however, that if

$$i > m + h$$

Then social insurance will reduce welfare unless:

1) market imperfections render the pre-existing situation sub-optimal;
2) social welfare function calls for re-distribution
3) there is economies of scale for social insurance

There is general consensus among policy makers, pension experts and representative of civil society of a three pillar approach to income security programmes for the aged (Estelle James 1997;ILO 1999):

1) a publicly managed tax-financed public pillar for redistribution that keeps old people out of poverty;
2) A mandatory but privately managed funded pillar that links benefits closely to contributions, for the saving function;

3) Voluntary saving annuity plan for persons who want more;

The main objective of pension system is to provide individuals with retirement income which would allow them to enjoy the same standard of living that they enjoyed during their working life. Retirement income, however, will ultimately depend not only on the savings, taxes or the model of financing system but also on certain risk factors associated with variables such as the demographic aging of the population, changing employment structure, wages/standard of living and prices.

In general countries are encouraged to use at least two branches of the pension system. This paper examines the provision of retirement pension in Trinidad and Tobago by means of the social security system against the backdrop of the normal arguments for government intervention. The system is analyzed in terms of its mandatory saving function, its insurance function and re-distribution function.

Methodology

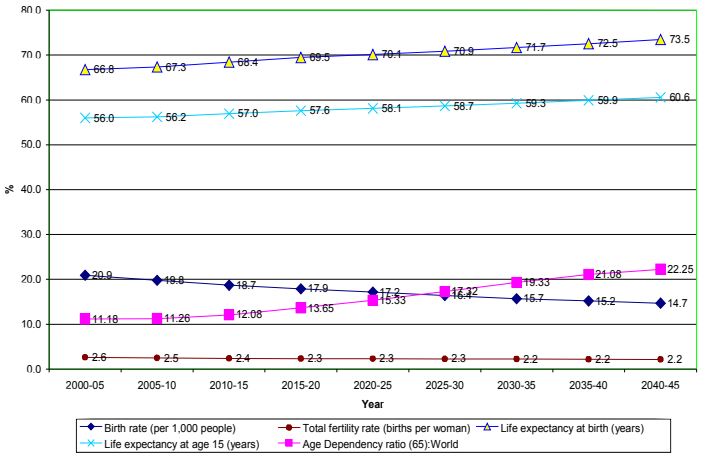
This paper is based on secondary collected from international agencies such as United Nations Population unit, the Trinidad and Tobago Statistical Office and National Insurance Board.

Some Evidence Of The Operations Of Social Insurance In Trinidad And Tobago

International dimension: In 45 years the world over 65 population is expected to more than double, increasing from 11 percent in 2000 to 22 percent in 2045 (United Nation 2000). Falling fertility rates and a steady growth in life expectancy in the first half of the

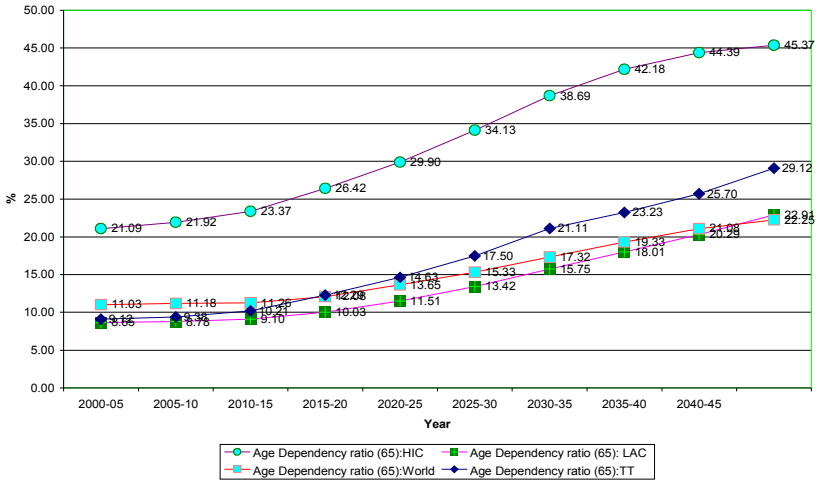
twenty first century is likely to produce dramatic increases the world's elderly population (Chart1).

Chart 1: World Population Statistics



There is, however, a considerable difference in the increase in the elderly population proportion that is taking place among countries and/or groups of countries. In 2000 the proportion of the elderly population in High income countries (HIC) was a little less than double the world elderly population proportion and more than twice what it was for lower and middle income Latin America and Caribbean countries (LAC). (Chart 2). Over the next 45 years the gap in the elderly population proportion between HIC and LAC is expected to widen. In Trinidad and Tobago the growth in the proportion of the elderly population is high both when compared with the LAC grouping, of which it is a part, and world growth rates averages. (Chart 2).

Chart 2: World Population Statistics



These trends combine with other developments such as changing employment structures, wages and inflation have enormous implications for developing countries like Trinidad and Tobago because of the potential

effects they are likely to have on income smoothening in an inter-temporal sense. The next section would attempt to analyse evidence from Trinidad and Tobago with respect to business of the providing retirement income for the aged.

Main features of Trinidad and Tobago Social Insurance System

The Trinidad and Tobago social insurance system was set up in 1971 but only started operations in 1972. The financing arrangement was based on a pay as you go system with a funded element providing coverage for a defined package of benefits under three separate braches: short-term, employment-injury and retirement income (Table 1).

Table 1:Benefit structure.

Short Term	Sickness Benefit; Maternity Benefit; Death
Employment-Injury	Injury Allowance; Disablement Pension Gratuity; Death Benefit; Medical Expenses
Long Term	Retirement pension benefit; Invalidity Benefit; Survivorship Benefit

This paper will focus on the retirement benefit. To qualify for this benefit a worker must have attained the age 60, have paid or contributed the equivalence of at least 750 weeks of contributions and not be engaged in gainful employment or have attained the age of 65

This means that someone who remains in active employment after 60 but has not reached the age of 65 will not qualify for the retirement pension. The retirement benefit contribution is based on the assumed average weekly earnings of the class assigned to the insured. The assigned average is based on the average of the contributions by the worker.

The basic amount payable, based on the March 2004 revised payment structure, is equivalent to 29.8-47.7 percent (Table 2)

Table 2
Benefit Structure

Earnings Class	Weekly Earnings	Monthly Earnings	Assumed Average Weekly Earnings	Pension payment (before March 2004)	Pension payment (%) before march 2004	Pension payment (after March 2004)	Pension payment (%) after march 2004
Class I	100-159.99	433-692.99	130	62.0	47.7	250.0	192.3
Class II	160-219.99	693-952.99	190	80.6	42.4	250.0	131.6
Class III	220-289.99	953-1256.99	255	95.5	37.4	250.0	98.0
Class IV	290-359.99	1257-1559.99	325	110.4	34.0	250.0	76.9
Class V	360-439.99	1560-1906.99	400	124.0	31.0	250.0	62.5
Class VI	440-529.99	1907-2296.99	485	146.9	30.3	250.0	51.5
Class VII	530-619.99	2297-2686.99	575	173.0	30.1	250.0	43.5
Class VIII	620-709.99	2687-3076.99	665	199.0	29.9	250.0	37.6
Class IX	710-809.99	3077-3509.99	760	226.9	29.9	250.0	32.9
Class X	810-909.99	3510-3942.99	860	256.7	29.8	256.7	29.8
Class XI	910-1009.99	3943-4376.99	960	286.4	29.8	286.4	29.8
Class XII	1010 and over	4377 and over	1010	301.3	29.8	301.3	29.8

Source: The National Insurance (Amendment)

A minimum of about $250 per week was introduced in 2004.[3] Workers were also given increments on their pension payment which varies by class and is about 1.5 percent of the basic assumed weekly earnings. Workers who do not quality for the retirement pension because of, for instance, they did not make the 750 weeks of contributions or its equivalence will qualify for a retirement grant which is three times the contribution paid on behalf of the worker.

Financing

Contributions are payable with respect to every employed person and unpaid apprentice in insurable employment who is 16 and older but not older than 65 years. The amount

[3] The weekly payment is based on the number of Mondays in the month. The minimum payment is $1,000 per month. I therefore simplify by using four Mondays in every month.

paid in 2004 was equivalent to 8.7% of the assured average weekly earnings of the class to which the individual was assigned (Table 3).

Table 3

Earnings Classes and Contribution Rates from March 2004

(Based on a 8.7 % contribution rate)

Earnings Class	Weekly Earnings	Monthly Earnings	Assumed Average Weekly Earnings	Employee's Weekly Contribution (%)	Employer's Weekly Contribution (%)	Total Weekly Contribution (%)
Class I	100-159.99	433-692.99	130	3.8	7.5	11.3
Class II	160-219.99	693-952.99	190	5.5	11.0	16.5
Class III	220-289.99	953-1256.99	255	7.4	14.8	22.2
Class IV	290-359.99	1257-1559.99	325	9.4	18.9	28.3
Class V	360-439.99	1560-1906.99	400	11.6	23.2	34.8
Class VI	440-529.99	1907-2296.99	485	14.1	28.1	42.2
Class VII	530-619.99	2297-2686.99	575	16.7	33.4	50.0
Class VIII	620-709.99	2687-3076.99	665	19.3	38.6	57.9
Class IX	710-809.99	3077-3509.99	760	22.0	44.1	66.1
Class X	810-909.99	3510-3942.99	860	24.9	49.9	74.8
Class XI	910-1009.99	3943-4376.99	960	27.8	55.7	83.5
Class XII	1010 and over	4377 and over	1010	29.3	58.6	87.9

Source: The National Insurance (Amendment)

The actual payment was made by both the employer and employee in a 2:1 ratio. Changes in the 2005 and more are expected in 2006 but these changes would not alter the analysis which is based on the 2004 rates.

Reserves

The system is also responsible for managing the fund reserves. Since we would be looking at retirement pension then the focus would only be on the long term reserves fund. Strictly speaking the National Insurance Board's records it reserves in two

accounts: pension funds (which also includes it short term funds and employment injury fund) and accumulated reserves accounts.[4] Funds from these accounts provides a hedge against all contingencies: long term, short term and employment injury. However, both funds will be treated as reserves for retirement pension. This assumption will not affect our conclusion.

Evaluation

This subsection will evaluate the redistribution function of the board. An examination of the benefit structure will reveal that it is progressive and that it would, therefore, assist in the redistribution of income in favour of the lower income classes (Table 2). Table 2 shows that at retirement a worker in the lowest wage classes will get the equivalent of about 47.7 percent of his/her assumed weekly earnings. The percentage falls off steeply for the higher income classes. For the highest income class the percentage is 29.8 percent of that class assumed weekly average earnings. Table 2 also shows what happened after 2004 when a minimum monthly pension payment was introduced. The changes resulted in the two lowest classes getting retirement incomes above their assumed weekly retirement earnings. The revision did not change the situation for the top classes. The situation in all other classes changed but no by the same degree.

The contributions rates were calculated ass a fixed proportion of the assumed weekly earnings (table 3). Therefore, the contribution structure does not result in the relative re-distribution of income among wage earners. However, because employers are required to pay 2/3 of the contribution on behalf of the employee who are the eventual beneficiaries,

[4] This is name of the agency which has responsibility for managing the social security system of Trinidad and Tobago

then the contribution structure does at least in the first round of effects results in the re-distribution of income from employers to employee.

In summary, the benefit rate structure does assist with the redistribution of income in favour of the lower earnings classes. The contribution structure re-distribute from employer to employee.

Retirement income provision function

This function can be sub-divided into two function:

- to ensure that as many workers enjoy the retirement income protection;
- to cover as much of the worker's income as possible and to ensure that the finances of the system are healthy and that it would be able to delivery on it pension in the future.

The scheme is not universal. It does not cover all categories of workers. It does not cover the self-employ nor does it after protection to agriculture worker and casual workers. Data suggest that this category of workers accounts for a little less than 30 percent of the insured population.[5]

The Board does provide protection against old age but as can be seen from table 2 the level of income protection is inadequate particularly for the higher earning classes which

[5] Information on own account worker which is routinely collected by the central statistical office and is often used in the literature to represent the self employed stood at about 29 percent of the insured in 2004 which was about 356,187.

represent a wide cross-section of professional worker such as teachers, other middle and senior public servants and others. Persons in these and higher classes may have to supplement their social security pension with an annuity.

Insurance function

Informational inefficiencies makes is difficult for each person to have an optimal lifetime financial plan which will not only depend on his lifespan but also on his consumption preferences through time.

The Board does provide protection against old age but as in inadequate as it is, it is only relevant at the time when it is given. The pension income is neither protected against the risk of inflation nor the risk of changes in the standard of living. The pension is neither index to prices nor to some other variable like, for instance, the changes in the standard of living or average consumption so as to allow the pensioner to maintain his status relative to others in the society. Table 4 shows that anyone who received a retirement pension in 1994 or before would have experienced a great cut in the purchasing price of his fixed income. Additionally, his relative position relative to wage earner or self employed persons would have deteriorated.

Table 4

Changes in prices and Real GDP

Year	Real GGDP	Inflation rate
1994	5	8.8
1995	3.2	5.3
1996	2.9	3.3

1997	1.2	3.7
1998	4.6	5.6
1999	5.8	3.5
2000	7.3	3.6
2001	4.3	5.6
2002	6.8	4.2
2003	13.2	3.8
2004	6.2	3.7

Trinidad and Tobago Central Bank reports

A little calculation of the about figures would revealed that the fixed pension received in 1994 would have loss about 40 percent of it value by 2004. At the same time he/she would witness the among of products enjoyed by his neighbour increased by about 79.4 percent.

It is clear that inflation risk and changes in the standard of living risk could severely dislocate the aged.

Stability Issues

The sixth and last actuarial review done by the Board covered the period 1995 to 2000. The report indicated that the finances of the social security system were healthy and that the board was actually solvent. The report also indicated that the contribution rate of 8.4% in 2000 was twice the contribution rate required a to strict to pay-as-you-go basis to meet current expenditure of the scheme.

The report further indicated that the scheme was 76% funded and that the Board could operate with the contribution rate of 8.4% for the next 40 years and have enough to

finance during that time to meet its expenses. By 1940, if the rate remains unchanged then as sizeable increase in contribution rates would be required to sustain the fund. The author has also provided cruel projections for nominal GDP over the same period. The average growth over the period 1994 to 2004, was used as the basis to generate the series GDP.

The table reveals the social security system is itself a significant institutional saver and that it role as saver is likely to increase in the future. Social security fund is expected to expand from a ratio of 13.1 percent of GDP in 2004 to peak at 33 percent in 2030 and then fall slightly thereafter provided that the contribution/benefit rate structure remains unchanged.

Table 5: Total Funds and GDP: Actual and Project

Year	Total Fund ($M)	Inflation rate	Current GDP at MP	Total fund as a % GDP
1994.0	2808.3	8.8	29311.7	9.6
1995.0	3049.5	5.3	31665.0	9.6
1996.0	3274.7	3.3	34648.0	9.5
1997.0	3857.8	3.7	36969.7	10.4
1998.0	4498.7	5.6	40382.5	11.1
1999.0	4991.1	3.5	42889.1	11.6
2000.0	6329.7	3.6	51370.6	12.3
2001.0	7167.0	5.6	55007.3	13.0
2002.0	8280.5	4.2	55365.6	15.0
2003.0	8509.5	3.8	66168.3	12.9
2004.0	9394.0	3.7	71878.0	13.1
2005.0	11933.0	n/a	78723.3	15.2

2006.0	13350.0	n/a	86220.5	15.5
2007.0	14765.0	n/a	94431.8	15.6
2008.0	16297.0	n/a	103425.0	15.8
2009.0	17954.0	n/a	113274.7	15.8
2010.0	19551.0	n/a	124062.4	15.8
2015.0	29047.0	n/a	135877.5	21.4
2020.0	40565.0	n/a	148817.8	27.3
2025.0	52286.0	n/a	162990.5	32.1
2030.0	60674.0	n/a	178512.9	34.0
2035.0	60895.0	n/a	195513.6	31.1
2040.0	46587.0	n/a	214133.3	21.8

Central Statistical Office; National Insurance Board

The fund is itself exposed to a number of risk:

1) Inflation risk.
2) Foreign exchange risk. The Board by law is required to invest most of its fund in government bonds. It is prohibited from investing overseas.
3) As a result of '2' there is a low interest risk.
4) The demographic risk-population aging

   In the context of an aging population where the number of persons in retirement is increasing relative to the number of working people then the burden of financing the scheme might become unbearable for for those who currently working. In tis context the
5) Poverty risk

In anticipation of maturation and the aging of the population there will continue to be growth in the pension funds reserves which has the potential to impact of the on the financial architecture of the country. It has become a crucial aspect of government

finance and if allow to participate on the domestic capital market can represents a threat / challenge to banks in their role as intermediaries.

As the Board seeks to become deal with the risk outline above to provide more protection for the age perhaps by becoming fully funded there would be a rise in pension reserves which it self would have major financial effects.

Some preliminary suggestions:

1) Introduction of defined contribution structure – allow for the development of individual reserves The benefit would not define. Individual got what they put into the scheme plus interest minus expenses. They bear the full risk etc
2) There is need for indebt analysis of the various risk associated with the value of the pension fund.
3) A proper costing cost of indexing pension payments to either average consumption or prices should be undertaken.
4) The extent to which pension funds can play a role in capital market development in Trinidad and Tobago and the region needs to be examined.
5) Some proportion of pension fund should be use to develop a cadre of expert to invest in international capital market.

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