The Impact of Population Ageing and Unemployment on Pension Systems in SAARC Region

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CERTIFICATE

This is to certify that this thesis entitled **""The Impact of Population Ageing and unemployment on Pension Systems in SAARC Region".** submitted by **Mr. Liaqat Ali** is accepted in its present form by the Department of Business Studies, Pakistan Institute of Development Economics (PIDE) Islamabad as satisfying the requirements for partial fulfillment of the Degree of Master of Philosophy in Economics and Finance.

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LIST OF ACRONYMS

ADB	-	Asian Development Bank
CBT	-	Central Board of Trustees
CPF	-	Central Provident Fund
CPI	-	Consumer price index
DB	-	Defined benefit
DC	-	Defined contribution
EOBI	-	Employees Old Age Benefits Institution
ETF	-	Employees Trust Fund
GDP	-	Gross domestic product
IPD	-	Implicit pension debt
NDC	-	Notional defined contribution
OECD		Organisation for Economic Co-operation and Development
PAYG	-	Pay as you go
PFRDA		Pension Fund Regulatory and Development Authority
PPF	-	Public Provident Fund
SECP	-	Securities and Exchange Commission of Pakistan

Local currencies and exchange rates (as on 12 November 2020)

Country/Currency	Exchange Rate
Afghanistan (Afghanis) AFA 77.05 =	US$1
Bangladesh (Taka) BDT 84.82 =	US$1
Bhutan (Ngultrum) BTN 74.40 =	US$1
India (Rupees) INR 74.62 =	US$1
Maldives (Rufiyaa) MVR 15.41 =	US$1
Nepal (Rupees) NPR 119.03 =	US$1
Pakistan (Rupees) PKR 158.43 =	US$1
Sri Lankan (Rupees) LKR 184.56 =	US$1

Source: Central Banks of respective countries

ABSTRACT

This paper attempts to study the civil service pension systems of South Asia Association of Regional Cooperation using the data from 1971-2017. It assesses the patterns in the pension expenditure of member countries while finding the relationship between this expenditure and demographic changes both at the regional and country level. The paper uses Mean Group and Pooled Mean Group estimator techniques and employs the Auto Regressive Distributed Lags (ARDL) model both in the short run and long run. The paper finds that the population ageing in the SAARC region has statistically significant positive relationship with the pension expenditure in the region while the dynamics of population ageing differ from country to country in the short run.

Key Words: Civil Service Pension, Pension Reforms, ARDL, Public Finance

INTRODUCTION

Since history, the humans have endeavored to repel the risks of social, economic, health and life sufferings. Humans have the natural tendencies to protect themselves from misfortunes. Adversities of many kinds cautioned human beings to live together and evolved the concept of collective measures. The sense of collective measures resulted in the strong institutions like family, groups, communities, tribes and finally states. These institutions had the same objective i.e to protect and ensure the social security needs of the population as a whole. The importance and validity of social security is profound in case of people who have lesser advantage due to ageing, disablement, loss of job, death, retirement etc. In this regard, people more vulnerable to social security risks need to be cared of. Old age[1] people are the most vulnerable segment of population who needed to be looked after. The government bearing the authority can make policies to protect old age population from such vulnerabilities and to provide income security for the vulnerable like old age population.

Income security for the old age population has become a priority worldwide. With the increasing rate of population ageing many countries are concerned about income support and provision of adequate safety nets for the elderly citizens. Currently the old age population is supported by informal family arrangements (traditional joint family/nucleus family system). With the current demographic trends and functioning pension systems the old age poverty would be a burning issue in near future (Kumado & Gockel 2003). Many countries around the world have taken measures to reform their pension systems. Some of the these reforms are success stories however cannot be replicated most of the South Asian countries due to the required initial conditions and prevalent social, cultural, demographic structure, economic outlook, labor market, history and governance challenges. One of the main protection measures is to ensure the income security and consumption smoothing for the old age population.

Current pension systems are meant to serve the above purpose that is to protect the former workers from economic and social risks while ensuring and decent life after

[1]The old age people are referred to those who have reached retirement age or age eligible for receiving pension benefits.

the retirement from work. Pension systems have evolved over the period of centuries. The modern pension system aims to reduce the economic vulnerabilities of old population through income support measures to ensure the decent lives at older age. With a range of different pension systems around the world, the most common feature envisaged by pension systems is to provide reliable income to older people, reduce poverty at old age population and insure smooth consumption regardless of gender.

1.1 Importance of Pension System

The modern world pays significant importance to social security and regards it a basic human right. It is accepted globally and has been ratified by almost all countries as enshrined in Universal Declaration of Human Rights[2] and the International Covenant on Economic, Social, and Cultural Rights[3]. In short, unlike the common chore as rhymed, pension is a necessity and not a luxury.

1.1.1 What is pension?

Precisely, pension is an institutional arrangement to pay monthly or lump sum income benefits to the individuals who retire, leave, becomes disabled or loses job. It can also be paid to the dependent s in the family due death of the employee. Theoretically, it resembles an annuity or lump sum payments system to the retirees at certain level and until death. Pension can be called a saving for the post retirement period. Pension can be defined from two perspectives.

From the viewpoint of the recipients of the pension benefits or individual level the pension system is a source of insurance and consumption smoothing.

a) Pension is insurance for individuals used as a safety valve against going out of funds. The individuals don't know how much income is needed in the future to live a decent life. This way, he/she may save more or less to save the sufficient amount of fund for future. It is difficult to calculate the amount of money to be saved from the working life finances as uncertainties about life span looms around the head. Due to the lack of

[2]Adopted by the UN General Assembly Resolution 217A (III) of 10 December 1948; Articles 22 and 25.
[3]Adopted by the UN General Assembly Resolution 2200A (XXI) of 16 December 1966; Article 9.

sufficient information the individual is caught between losing a decent life during working life or otherwise. The system of insurance is best used as the life expectancy for the society is already known. The amount of money pooled for the retirement life can be calculated by adding the principal amount with accumulated return.

b) Decent life demand consistency and certainty as the basic necessities of life keep demanding. The earners during working life have the capacity to meet such expenses from their income. However meeting such expenses during retirement period is not certain. Saving for retirement has two benefits. First, one can pool money in appropriate way by saving for future when it is found that a portion of income can be saved after essential consumption. Second, such savings provides the pensioner with certainty about future resources available and would mitigate the chances of poverty at least in notional terms. The central idea of pension system from individual level is to ensure the well-being of people at every level of age over the period of entire life. This can be done by transferring the consumption from earning age to the pensionable age. This is the concept of smooth consumption with the objective to level the level of consumption over the entire life time.

From macro level or public policy viewpoint the pension system can be viewed as tool for poverty control and redistribution mechanism.

a) Poverty refers to a condition with purchasing disability. One with no funds to pay for necessary expenses is referred to be poor. It is mainly caused by the lesser or insufficient income due to many reasons. Income provision at the older age is almost impossible as the older people lose the capacity to earn. The case of retired individuals is the most prominent example of transient poverty which is most of the government care for in the form of main pension systems for the civil servants.

b) Society needs a balance and the equitable source of income and expenditure. It is responsibility of the government to ensure the implementation of appropriate tax rate to finance the vulnerable areas of the economy. The difference lies between the steep earners and flat earners and the earners and no-earners like retired persons. So, the appropriate tax rate enables the transfer of income from steep wage earners to low earners who get retired. Also, the working population can be taxed to transfer the necessary amount to non-working population. Later is more prominent example of inter-generational transfer of income. Redistribution can also be effected in case of families where the married couples consume more than single persons.

The above discussion shows the importance of pension system. Broadly speaking, pension system ensures the transfer of current consumption for future. It insures from unbecoming financial situation while ensuring the smooth consumption over the entire life. Though not discussed above pension system also protect the family and dependents of an employee who dies during his working life. Also, pension is meant for the people who lose the ability to earn due to permanent disability.

1.2 Types of Pension System

There are different types of pension systems. This section discusses each pension types with its associated characteristics to on the basis of specificities.

To start with, defined benefit pension system is the most common type of pension system among civil services around the world and especially among SAARC countries. This type of pension scheme pays the pension level that calculated and paid as per formula. It calculates the pension benefits based on the set rates and parameter like the average wage, last basic pay drawn, accrual rate, replacement rate, years of service etc etc. The pension benefits depend on wage history or last basic pay and the length of service. There is no separate fund or investment pool for this purpose thus the burden of future liabilities lie on the shoulder of the employer, state in most of the cases. The inclusion of the wage is very tricky and important. The last basic pay formula benefits individuals with steep earnings and those who make it to senior ranks no matter if he/she stays for one month. The final basis pay calculation is not equitable as very few would be having very generous pension at the cost of others with smaller share of monthly pension. The alternative way is to calculate the average wage over a specific period or over the entire working life. In either case, a person’s annuity can be, in effect, wage indexed until retirement. Defined benefit scheme can be funded or unfunded.

a) In case of unfunded defined benefit the allocated assets for the payment of the pension benefits does not exist. This way the employer, government in most cases, are has to pay for the pension benefits. Theoretically, it is paid from the tax contribution of current workers on Pay-As-You-Go (PAYG) basis. PAYG system is generally administered and managed by the states as it suits the civil service both in terms of retention and the wage compression in public sector. It does not provide with a separate fund for the pension investments or pooling. The government simply allocates the budget for the pension and is ultimately financed by the tax payers. The state does it on a concept of taxation knowing that the retirement benefits could be financed/paid thorough the tax revenues collected from the working population. However, in reality it is paid directly from the national budget. It has two perspectives:

   i. From the individual viewpoint, it is obligatory payment to the retirees who rendered his services to the state and has the right to be paid during retirement age. It is mainly due to the incapacity of the retirees to save during the working life due to low wage or unavailability of the investment vehicles. Above all the state promise the civil servants defined pension benefits at the time of joining civil service with some eligibility conditions and requirements. This form of income security in enshrined in many state constitutions.

   ii. From macro viewpoint, the taxation arm of the government stretches to finance the retirement benefits to specific group of people through the revenue generated from across the population. Strictly speaking, this is income transfer from one group to another group because the tax is similar while the pension benefits vary from case to case basis. So the contributions made by the current generation in the form of taxes are meant to be paid to the earlier generation. It is interesting to know that the generation receiving higher pension benefits than his contributions (Samuelson 1954). In strict terms, the PAYG scheme guarantees the redistribution and risk sharing across the generations.

b) Funded defined benefit plan are financed through the contributions from the employer and in some cases from the employee to meet the benefits. It can be fully funded or partially funded:

   i. Fully funded pension scheme is the scheme in which the amount of benefits sharply equates the amount of the contributions received. Fully funded schemes are based on saving thorough investment and benefits are dependent on the amount invested and rate of return on it. It more like asset accumulation over a period of time that could be exchanged at later point of time. The greatest advantage of a fully funded system is the sufficiency of reserves to pay the financial liabilities swiftly and readily.

   ii. The benefits are simply calculated as the pension benefits would not exceed the accumulated contribution and returns added on in case all other factors remain constant. In the absence of redistribution, the individuals would get exactly the same amount i.e the principal amount pooled and the returns earned on that investment. Important to note here, the contribution of the employee is the fraction of his/her wage.

   iii. Contrary to the fully funded plan is the partially funded plan where the benefits are paid by the employer in case of financing gap. Partially funded plan is a middle way between the PAYG and funded scheme. The sponsor is the main driver of the contributory scheme who ensures the scheme's financial balance.

As evident from above discussions, defined benefit schemes can be contributory or not. It can be administered by the employers or the state. If it is run by employer, then the risks fall on the employer depending on wage rates, firm's profits, inflation or investment performance. In majority of cases it is managed by the states and financed from national budget or by the taxpayers.

> The contributory scheme exposes individuals to the risks of adverse outcomes while the non-contributory plan puts the risks on the tax payers. In this case, the government adjusts the pension benefits through lump sum increase or indexation methods to balance the revenue and expenditure. In a pure defined benefit system the individuals are immune to all types of risks. Defined benefit is very lucrative for those who have long years of service and are steep earners regardless of time span spent in the higher rank. This scheme would not offer a good return for those with lesser years of service and flat earning profiles. Also it does not offer a good return to the people who exit the job before retirement. In such cases the defined contribution suits best. The benefits of PAYG or funded system depend on many factors and vary country to country. The important factor relevant are the individuals behavior towards contribution and saving, the countries institutional capacities to administer the investment pool, labor supply elasticities and state ideology or welfare state or otherwise.

On the other hand, defined contribution pension system, as the name implies is based on the mechanism in which the retirement benefits depend on the contributions made. It is based on a set formula that depends on the amount contributed and the returned earned on investment. The individuals contribute a fixed fraction of their monthly earnings into an individual account. The accumulated contributions are then invested in financial assets and the returns are credited into the individual accounts. Theoretically, the amount contributed is used to invest in assets and the return earned is accumulated for retirement benefits. This mechanism is built on the concept of the provision of pension benefits without any hiccups at the time of retirement. In reality, the fund functions as an institutional investor investing in a pool of portfolios. It can buy assets and sale it on profit or loss the contributions made are considered as overall investment and return on it. The principal and returns are then paid periodically or in lump sum. The individuals invest a fraction of their earnings to be invested in assets through funded individual accounts. The pension benefits would depend on the rate of return on pension assets or the overall performance of the investment. This way the individuals bear the responsibility of the investment both in terms of risk and return. The performance of the pension funds would depend on the rate of return, earning trajectories and future pricing of annuities. In other words the individuals are exposed to each kind of risks i.e. annuities market risks, demographics shifts, investment risks, macroeconomic shocks and political risks. Exposure to these is the negation of basic objective of the pension system, ensuring the income security to older age population. The state can get away from these risks by introducing statutory provisions for minimum pension. This would safeguard the pensioners with a guaranteed amount of pension benefits. It ends up with the concept of pension benefit formula depending on the life expectancy and the interest earned from the accumulated contributions with specified minimum ceiling.

Last but not the least is the modified version of defined contribution pension system, the Notional Defined Contribution pension system. Based on the strength and weaknesses of defined benefit and contribution schemes the need for third scheme is natural. Driven through excessive demands for innovative solution, a new scheme called Notional Defined Contribution is introduced. As the name implies it similar to defined contribution scheme and the risk is transferred to the individual and this risk becomes evident in pension benefits. However, it may be fully funded or entirely PAYG due to its design and functional characteristics. The individual creates a notional individual account by contributing a fraction of his/her salary and it is assumed that the accumulated contributions are invested in financial assets. The returns and loss is assumed with notional interest rates. The accumulated contributions in real and the returns made on the basis of notional interest rate are converted into annuity and are paid to the individual in a periodic or lump sum manner. In short, the real investment is not taking place while the method benefits the record keeping and calculation of every individual. It is rather more like a funded defined contribution scheme with contributions made from individuals but the returns set by the government. Many researchers have worked on its different aspects and found that the NDC scheme can incorporate the distributional component through the concept of guaranteed minimum pension or subsidizing the contributions of temporary unemployed individuals (Palmer, 2005). It is also pertinent to note here that the NDC is not a defined benefit system as well because unlike defined benefit scheme the NDC benefits are calculated on the basis of contributions and not on the basis of past earnings. If the contribution rate remains constant over the entire career then it is similar to defined benefit system.

The types of pension system can be on the basis of financing mechanism, it can be contributory or budget-financed. The concept of contribution is based on the amount pooled by the employer or the employee. It can be in any ratio depending on the earning and wage level. The most common is the matching principle where the employer contributes in the same ratio employee does. Also the ration varies from country to country and case to case basis like 8 percent and 12 percent or 11 percent and 9 percent. This is joint contribution method benefitting the retirees. This form of pension plans is financed from the general budget. The benefits are paid without any source of income or pooled finance.

The World Bank introduced pillar system in pension system which helps understanding the design, functioning and purpose of different pension systems. The three pillar system (World Bank, 1994) is based on the management, nature and design of pension system. The first main pillar is publicly managed unfunded defined benefit scheme, second pillar is contributory in nature is privately managed funded defined contribution schemes and the third pillar refers to the voluntary retirement schemes.

Income security has become a major point of discussion in South Asian countries. The region has unique dynamics with a lot of similarities amongst the counties in the region. These similarities make public policy initiatives replicable among or between the countries. The demographic projection is South Asia has led some countries to change their policies to cater the needs of old age population in the future. The changing demographic profile puts significant fiscal pressure on the national budget mainly due to the increasing pension expenditures. The pension systems in most of the South Asian countries are century old which needs to be aligned with the current and future needs. The demographic projections highlight the most important issue associated to the design and functioning of the current pension systems i.e fiscal sustainability of the pension system. Currently the old age population is almost 112 Million in South Asia is projected to cross 307 Million in 2050.

Old age poverty especially in rural areas of South Asia has been alarming[4]. The absence of sound income security provisions for the elderly population raises the alarm bell. Also, due to the prevalent modernization and rapid urbanization in South Asia the old age poverty would increase in the absence of a retirement income provisions (Kumado & Gockel 2003). Culturally, major share of old age population depend on the informal income arrangements such as intra-family transfers. The region has a history of higher rate of co-residence due to prevalent nucleus family system. As evident from available data more than 1 out 10 workers in the region would be entering the old age (Lasagabaster, Bogomolova, Costain, Dobronogov, & Palacios, 2005).

As the demographics patterns change, Old-age dependency ratio (ODR) – this is the percentage of people of working age (15-59) who are supporting those who are pensioners (60 or older)- also changes. This paper uses the PSR to find the same ratio. The declining PSR shows the increasing gap between tax collected from working population and the pension benefits being paid to the old age population. This situation put the current pension system under fiscal pressure while questioning its sustainability over the period of time.

Thus pension reforms are becoming important for its fiscal, economic and social importance. As evident from the available data the civil servant pensioners constitute a very low proportion of the old age population and reforms are needed to cover the whole population for greater effect that encircles many aspects of the public policy. In a nutshell, the main objective of a sound pension system is to ensure income security and smooth consumption over lifetime.

Table 1-1 Pension system for civil servants

Country	**Type of pension system**	**Pensioners share of elder population 60+ (In percent)**

4 Monthly report "World Economic Situation And Prospects" October 2019 Briefing, No. 131

Afghanistan	• PAYG* Defined Benefit	• 7
Bangladesh	• PAYG Defined Benefit • Provident Fund	• 3.7
Bhutan	• PAYG Defined Contribution • Provident Fund	• 7
India	• PAYG Defined Benefit • Defined Contribution system of new civil entrants after 2004	• 18
Maldives	• PAYG Defined Benefit • Provident fund	• 42
Nepal	• PAYG Defined Benefit • Provident fund	• 10
Pakistan	• PAYG Defined Benefit • Provident fund (it was missing in WB paper)	• 8
Sri Lanka	• PAYG Defined Benefit • Funded DB for new civil servants after 2003	• 17

Source: World Bank data on pension coverage

** Pay As You Go*

As shown in the Table1 the existence of provident fund, contributory saving mechanism, shows that the funded system is already invoke in many South Asian countries. Provident fund scheme is more like a long term saving plan but due to many reasons is not being invested efficiently. There is a need to unify both the pension and provident system for better management and performance of the overall pension system.

1.3 South Asian Association for Regional Cooperation (SAARC)

The South Asian Association for Regional Cooperation (SAARC) is a regional organization of South Asian countries including Afghanistan. It was founded in 1985 under the SAARC Charter in Dhaka and comprises of eight Member States: Afghanistan[5], Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. One of the main objectives of the SAARC organization is to focus on the welfare of the people while the improving the quality of lives of the people living in the region. It plays important roles in the region which encompasses activities from regional connectivity to international cooperation. The cooperation amongst the member countries ranges from human resource development to poverty alleviation beside other activities.

Most of the SAARC member countries remained under the British rule until 1947. Most of the pension systems in the region have roots to the British legacy. The institution of the formal pension system under the British is 150 years old and was mainly for the civil servants excluding private sectors. However countries like India, Nepal, Pakistan, and Sri Lanka have introduced their versions of the retirement schemes for the private sector a decade after the end of (Lasagabaster, Bogomolova, Costain, Dobronogov, & Palacios, 2005). Still the pension system in SAARC region is characterized with low coverage as shown in Table 1.

The reasons for selecting SAARC as a subject matter are many. One of the main reasons is the significant similarities among the member countries in terms of demography, economic situation, history, culture, political structure and labor market. Also, many regions have shown the wave of pension reforms driven by the regional dynamics like MENA, OECD, EU, South East Asia etc.

1.4 Civil Service Pension

The civil service pension system is the oldest scheme in the world. It was the first type of pension scheme introduced by the British in South Asia as well. The main driver of the civil service pension is to the provision of an incentive for the people

[5]Afghanistan is the latest country joining the organization. It became the eighth member country in 2007.

to join civil service and to protect the former employees from social security risks. Distinct pension system for the civil servants is the justified for many reasons. Public servants have to work on the basis of authority to implement the rules and policies, neutrality in the disposition of their duties, integrity during the whole career path, security of job and postings, independence to take decisions, safeguarded from political interferences and attractiveness in the career. Pension is considered to be one form of remuneration though it is deferred for the future payment.

The civil servants are employees of the government and it is the responsibility of the government to ensure the wellbeing of the former employees when they retire from service. It is a source of attraction for the civil servants against the service and loyalty of the civil servants. It is imperative to mention here that since the civil servants are sitting in the policy making position so they are in the better position to fight their own case, though with positive bias towards their interests. In the developed economies the pension system for the civil servants is not very distinct as compared to other pension systems.

However this is very common in developing countries and also in many South Asian countries. It is very common that the distinct pension system for civil servants are generally very generous as compared to the other pension systems for the individuals working in the private sector. It can be seen that most of the pension systems in the developing countries are defined benefit calculated on the basis of final salary. The final salary method of benefit calculation always leads to very generous pension system. it is maintained that the pension system for civil servants are administered managed publicly through unfunded defined benefit PAYG basis. Thus the critiques find it a hidden liability pressing the national budget.

The objectives of the civil service pension schemes are very different from the other pension systems. Unlike the universal pension system for the whole population the introduction of civil service pension scheme encircles different objectives. Governments try to ensure the independence of civil servants while disposing their duties with authority and neutrality which cannot be done with the uncertainty about the future. Second, the civil service job don’t have competitive wage structure and most of the people are reluctant to join civil service due to its hard and fast discipline culture so the government offer special pension schemes to attract the new entrants into the civil service. Third, the above two factor lead to fiscal pressure when the payment of pension benefits are in effect. This means that the pension needs to be paid from national budget and the looks a huge liability if shown or disclosed publicly. So the government tries to hide the future liabilities by shifting the cost of pension system into the future. Last but not the least is to ensure the basic human rights of the retired civil servants with the guarantee of a decent life and wellbeing after regiment form the civil service (Whitehouse & Palacios, 2006).

Other than the above objectives, pension schemes can be used for economic development and economic growth by designing the civil service pension scheme in an innovative way that promotes the portability of pension benefits. Better pension arrangements encourage savings which can have positive effect on the capital markets. Increasing pension expenditure results in higher tax rates financing the pension expenditure which consequently hampers the economic growth. Badly-designed pension schemes cast adverse effect on labor market incentives.

Civil service pension schemes face many challenges as well. Historically the civil service pension schemes are publicly managed unfunded defined benefit in nature and design. Due to its design and functioning it is resultantly prone to different risks like rising inflation, fiscal deficit, population ageing, and economic recessions. Most of the civil service pension schemes are managed on PAYG basis financed directly from the national budget exerting huge fiscal stress as the pension scheme matures. This form of pension scheme still exists in former British colonies of South Asia in one or another form (Whitehouse & Palacios, 2006).

It the budget gimmick that the pension spending is shown as the contribution of working civil servants in the form of tax and thus not shown as the consolidated debt in the budget. Strictly speaking, the contribution from the working civil servants still is burden on the national exchequer as the annual increase in salaries is again the budget expenditure. The prefunding of these expenditures is not a common phenomenon due to the complexity of the civil service pension scheme.

As an example the contribution rate being same the pension benefits are very huge in case of those civil servants who make it to the senior ranks and with lengthy years of service.

Also the lower rank civil servant with lesser wage profile takes the higher pension benefits as compared to their contribution or tax rates. This is why the civil service pension is highlighted as generous due to its low population coverage and huge fiscal burden on the national budget. According to the World Bank data on pension, the non-OECD countries spend higher amount of budget as a percentage of GDP. Non –OECD countries have limited revenue generation capacity as well. Thus South Asian countries taxpayers bear the burden of unseen future liabilities or the government needs to borrow which is again paid by the tax payers. It is imperative to calculate and assess the pension expenditure compared with the revenue rather than GDP. The hidden cost of pension liabilities is not explicit as it does not capture the “inter-temporal” nature of the pension promise.

A good pension system covers almost the whole society. With the maximum coverage it is also expected to be adequate for exchanging against decent life. The adequacy should not contrast the affordability of the pension benefits as it pertains to the fiscal sustainability, economic viability and institutional capacity. It is also well expected the pension system be equitable for the whole society. In a nutshell, good pension system is based on sound financial footings. The pension system is linked with many aspects of the society and economy. So, the pension system should take into account these aspects. One aspect benefitting should not be at the cost of other aspects. There is a tradeoff between various economic and demographic aspects like population ageing, economic growth, capital market structure, labor market, human development initiatives etc etc.

The efficiency of a good pension system is dependent on the level of functions it performs. Generally accepted functions that are expected from a pension system are as follow (Ross 2004).

i. Collection of contributions
ii. Correct and timely payment of benefits

iii. Effective financial management and productive investment of pension assets
iv. Collection, compilation, sorting and record keeping of all collection, payment and financial activities
v. Disclosure of financial statements in a periodic way in best transparent way

It is clear from above discussion that the good pension system needs to be adequate with maximum coverage, affordable, sustainable and robust.

Based on the above discussions and the design of most civil service pension systems around the world there is a growing understanding that the civil service pension system resembles to tool of liability booster. PAYG defined benefit pension schemes is mostly unfunded and is financed directly from budget through the consumption of tax revenues. The defined benefit pension works in a way that the pension benefits are accrued when the civil servant joins the job. With relevant requirements and legal provisions the pension liabilities are calculated on a defined formula.

These liabilities become evident once matured. The pension liabilities need to be financed through sound payment mechanism for smooth functioning. In the current setup, the tax revenue from the working civil servants is hypothetically financing the pension expenditure. In reality, it is not the same as the tax from salaries is not consistent with the pension expenditure. Contingent liabilities often have major implications for fiscal sustainability (Cebotari et al. 2009). Also the lower tax base in the region casts doubt on the viability of the pension system to meet its future obligations. The pension expenditure for the civil servants as a share of revenue is higher than average when compared with the developing countries especially in case of Sri Lanka.

Overall pension coverage is very low in the region as compared to world. On the other hand, the pension benefits are very high as compared to OECD countries (Bangladesh, Bhutan, Nepal, and Sri Lanka), in terms of replacement rate. Bhutan has reformed the defined benefit component of it pension system in 2002. Sri Lanka and India have introduced contributory pension system with sharp differences in 2004 and 2003 respectively. Although the objectives of the reforms are same in each case however the differences exist which highlight the importance of different prevalent conditions in each country. Defined benefit scheme suits the region in the current scenario where the demographic profile is quite young with the positive cash flows but would be unsustainable in the long-term as it matures.

The formal pension system in each country has the civil servants as the major shareholder in terms of expenditure. It means that the major pension expenditure is being spent to the civil servant pensioners. As evident from the table 1 the low coverage shows that the civil servants enjoy generous pension. One of the main justifications for such generous pension is the issue of wage compression. This way the few civil servants at the senior ranks enjoy significant pension benefits with highest replacement rates possible. It is certainly very costly for the whole economy as a significant amount of public money cannot be invested in human capital or social safety nets. Also, many retired civil servants have lesser capacity to save for their old age due to rising inflation and lack of sound investment opportunities.

The above discussion calls for a unified, single and multi-pillar pension system which cannot be achieved without pension reforms. The multi-pillar pension system presented by (Holzmann, 2005) considers the dynamics of the demographic changes. However the current pension and provident systems have their own characteristics, dynamics and demands which envisage unique challenges and issues for every country.

1.5 Reforms:

Civil service pension reforms are considered to be distinct, the major source of critique. There is call for reform almost in every part of the world as it is delivering the expected objectives. Civil service pension schemes are considered to be generous while with a very limited coverage. The main drivers of the civil service pension reform are as follow:

i. The fiscal sustainability of the pension system as more and more developing countries are spending a significant share of national budget in pension schemes and the ratio of civil pension is much higher.

ii. Harmony between the public and private jobs. The public sector employees generally enjoy greater job security as compared to the employees working in private sector. The most staring difference comes in the pension benefits where the civil servants enjoy generous pension benefits. This way unified and comparable pension system is much in need to harmonize the public and private pension system.

iii. With the advent of the mandatory pension system for the private sector has resulted in the exit of senior civil servants so it is imperative to reform the pension system such that it penalizes the individuals who exit early in the form of early retirement or compulsory retirement.

Based on the above discussions there are two forms of reforms i.e parametric reforms and systemic reforms. The former is common in countries where the pre-requisite conditions are missing and still small steps are taken to reform the pension scheme. These measures are, but not confined to; changing the retirement age, changing the accrual and replacement rates, revision of formula for calculating pension benefits, penalizing the early retirement etc etc. On the other hand, systemic reforms overhaul the whole pension system and it can be done with sound foundations grounded for reforms i.e developed capital market structure, effective regulation and supervision, institutional capacity and pro-investment laws for funded investments.

The above facts lead us to main question, why these reforms now? The demographic trends of the eight countries show that the region is ageing. The proportion of the elderly relative to working-age population is increasing and also to the total population. The rising life expectancy is further supporting the argument. The median age of all the eight countries except Bhutan will exceed the world average by 2050 and same is the life expectancy at 60.

The design and function of the PAYG defined benefit pension scheme does not allow required investment to sustain the current pension system. Pension system for the formal sector has poorly performed in these terms and has accumulated a great deal of liabilities over the period of many years. This performance has a cost both for the participants and for the economy as a whole. Due to accrual nature of pension liabilities it cannot be shown in the financial statements and thus creates an open ended liability for the government. As the PAYG defined benefits pension system matures the pension expenditures explodes. This paper will focus mainly on the fiscal aspect of this issue while presenting the following reason for reforms;

- The century old pension scheme needs to be updated and conformed to the current needs and fiscal situations. It had least changed since its introduction making it very old and archaic.
- With the changes in demographic patterns, economic conditions and rapid urbanization the reform seems to be pressing as the demographic profile is fast changing and the defined benefit schemes would mature in near future. This change would exert a great fiscal pressure.
- The economic growth is encouraging in the region with remarkable economic achievements by Bangladesh and India and is high time for the extending the pension scheme to maximum population. Rapid urbanization is changing the family structure with higher rate of co-residence at the cost of the old age mainly depending on the informal income arrangements like intra-family income transfers.

The whole bunch of framework for reforms is needed to cope up with the demands of changing times. Starting from the civil servants, there is dire need to change and redefine the whole pension and compensation package. This means that the reform may stat from, but not confined to, changes rates and benefit formulae to meet the fiscal demand of the economy as a whole. Also the civil service rules relating to the pension may also be updated with relevant changes to encourage volunteer leavers while allowing greater mobility between public and private sector. Currently the pension system is based on the last pay drawn which carries huge pension benefits as the civil servant gets increased salaries for every year of service. There is a significant increase, or called very generous, pension benefits in case of those civil servants who reach at the highest rank with more years of service. There is growing debate on this pattern of the pension benefits but so far it is justified as tool to compensate the as wage compression.

At the moment, the replacement rates need to be brought to a realistic level. India is successful example in this regard. The funding mechanism could be introduced by establishing the contributory component structure as started in India and Sri Lanka for new entrants in civil service. It is also important to mention that the funds collected from the contributory component must be invested in diversified portfolios for maximum and smooth returns. The issue of the portability may also be addressed as the civil servants could switch their jobs from civil services to private sector without penalizing the early exit.

The most viable reform mechanism is the parametric one which is easy to start with without major changes. The changes in pension calculation like accrual rates; last pay drawn, qualifying service, commutation formula, indexation method and minimum and maximum retirement age. Better disclosure and liability calculation must be in place to sensitize public about the future liabilities of the government. This would also help the government to pave the way for the effective functioning of an independent fund management for future.

The design of defined benefit pension system based on PAYG mechanism does not allow to foresee and predict the retirement income based on any set formula. It is mainly due to the uncertainty in the increase in wage or pension. The civil servants do not know how much the salary would increase or what would be the effect of such increase on the retirement income. Also, these liabilities are not shown in the annual financial statements of the government as well. This arbitrariness also could be addressed in the pension reform package.

Transition from non-contributory to contributory pension system would bring huge cost but small steps could make it easy and cost effective. Start could be from focusing on initial requirements followed by key areas like investment environment, regulation and supervision like Pension Fund Regulatory and Development Authority (PFRDA) in India. The hurdles in the way of better capital market structure must be removed. The management of the provident fund may be given to an independent body with centralized administration and decentralized asset management.

The current pension scheme is considered to be more like a “quasi-tax” than a retirement income scheme due to its design and function. There is dire need of reforms to ensure the civil servants have trust and motivation to plan and save for their retirement lives. This needs greater public intervention by the government. The reforms could bring huge economic benefits as the pension liabilities would be huge in respect of GDP in the future. The funded pension system would help reduce the fiscal pressure while eroding the hidden liabilities over a period of time. This way the revenues may be invested in human capital development and other social safety net programs. With better governance, robust pension scheme foundations and improved regulation the civil servants could enjoy the portability of benefits from public to private sector.

Also, the funded pension system has greater positive effect on the financial markets. The government may introduce fiscal policies that could remove the barriers in the way of institutional investment like a pension fund. The establishment of institutional investment body would encourage the secondary mortgage market and could provide banks with credit and financing tools. It also helps the enterprises seeking credit for growth and investment. The funds could also be invested in equities as well extending the functions and volume of capital market. However the small economies could not reap the major benefits of this scheme.

1.6 Reforms in SAARC Region

Demographic shift, changing family structure, rapid urbanization and the unfunded nature of the defined benefit pension system is going to exert an absolute fiscal pressure in the future. SAARC countries have the advantage of young demographic profile right now and it paves the way for a start of reforms package while analyzing the future. Currently the pension systems in major SAARC countries are characterized by unfunded defined benefit based on PAYG system financed directly through the budget. It consumes a large share of the tax revenues and would blast once the pension debt matures. Currently expenditure related to the pay and pension of the civil servants is a great source of debate and discussion in many countries as these current expenditure crowds out major revenue in non-development projects and investments. The civil servants pension in India and Pakistan, two important economies, are marked for their special treatments as these accommodate the wage premium for the civil servants due to the wage compression.

Pension scheme for the civil servants in SAARC is characterized as unfunded hence there are no investment avenues. The importance of studying this topic is to highlight the issue of old age income security in the context of the general poverty with a focus on the old age poverty. As discussed in the previous sections it is important to reform the current pension scheme for better economic gains, fiscal sustainability and social policy priorities.

As evident from the above discussion the pension expenditure is huge as compared to other investments in social safety nets programs. Pension expenses for the civil servants benefit a small proportion of the old age population. Due to the lower tax revenues this expenditure drains disproportionately and consumes a significant share of tax revenue. So, this misallocation and disproportionate expenditure creates economic, fiscal and social policy challenges. Better budget allocation and proportionate expenditure could divert budget allocation to necessary sectors like human capital, poverty alleviation, healthcare etc as South Asia has to struggle a lot on poverty, basic facilities and basic infrastructure. Currently there is no portability of pension benefits between the public and private sector which result in labor market inefficiencies.

Establishment of pension funds with contributory pillar can have positive cash flow while easing the fiscal pressure. Pension funds have positive effects on the economy as it creates an institutional investment agency which could develop financial markets and capital markets. However the challenges are also intact with these reforms, as the robust regulatory and supervisory body is needed with well working capital market and banking sector. Walker and Lefort (2002) document this effect in Chile (new class of institutional investors interested in longer-term instruments.

1.7 Ageing Population in SAARC Region

The demographic profile of SAARC region is quite young at the moment but future would be thoroughly pressing if necessary measures are not taken today. As per the available data civil servants constitute the major portion of these pensioners thus the data on the formal sector like that of the civil servants is great to start with. Some of the main issues revolving around the problems for the old aged civil servants are as follow:

South Asia has a common culture of nucleus family structure where the concept of co-residence is very prevalent. It brings a relief to the old age care as most of the old age population relies on the informal arrangements like intra-family transfers. India has the highest co-residence rate of only 4 percent living alone. Similarly Bangladesh and Sri Lanka have almost the same co-residence rate as that of India. These informal arrangements have some restrictions both in terms of its adequacy and existence as the nucleus family structure is fast vanishing due to rapid urbanization. Also the income constraints due to increasing unemployment rate and general poverty ratio the many families cannot provide with the sufficient old age income support to their old age population thus pulling them into the vulnerability zone. This situation becomes alarming with current demographic trends as the demographic profile is moving from young to old as the ratio of old age population would increase from 7.1 percent in 2000 to 15.6 percent in 2045.

Sri Lanka has the highest rate of change in terms of demographic change and according to the data. Pakistan has comparatively an advantage at the moment but it is also changing fast. The average ODR in OECD countries and studies have found that the co-residence rates have gradually fallen in countries like Japan and the Republic of Korea. However the case of United States of America is different where the rate of co-residence has dropped very fast.

Factors like rapid urbanization, changing family structure and demographic shift concern the income security at old age. Funded system has the advantage of providing a positive cash flow and sustainable income stream in the form of pension for the old age population. The introduction of contributory component based on multi-pillar pension scheme Holzmann (2005) is the first step in the right direction. India and Sri Lanka have already taken such measures which show the reliability and relevancy of the reforms at the moment. Extension of coverage to overall population would be a challenge in South Asia. That is why the each country has its own dynamics and need to cater their political needs.

1.8 Overview of Formal Retirement Income Schemes in South Asia

The pension system for civil servants has a long history in South Asia. The pension scheme started for civil servants initially and was unfunded defined benefit based on PAYG pension system financed directly from general budget. Civil servants constitute a major portion of the formal sector and thus the civil servant pensioners consume the major portion of the pension expenditure. The reforms taken by some countries are as follow:

1.8.1 Afghanistan

Afghanistan has gone through years of political instability and social unrest which resulted in poor economic and financial performance and low revenue. There was almost no concept of taxation until recent history. Also the civil service was in shambles due ineffective governance and poor security. The civil servants were least inducted or hired however the number of pensioner kept increasing. This led to booming pension expenditure at the cost of national budget.

There were serious reforms in the civil service after 2004 that moved the concept of reforming pension system as well. The defined benefit pension system in Afghanistan is publicly managed and unfunded. The pension expenditure is growing fast. The pension spending is temporarily low 0.5-0.6 percent of GDP but is growing very fast at the 14 percent increasing rate. Without reform measures the pension expenditures will double in 5 years, triple in 8 years, and quadruple in 10 years of the 2018 (Fiscal Strategy Paper Medium Term Fiscal Framework 1399 / 2020, Ministry of Finance). Due to this fiscal outlook the government introduced reforms with the introduction of Public Pension Fund.

Pension system recently introduced to curtail the growing pension liabilities that are casting pressure on the economy. New Until 2012 the pension system in Afghanistan was based on manual procedure where the number of registered but unverified pensioners reached almost 125,000. The number of pension beneficiaries constitutes only 7.5 percent of the total labor force while 55 percent of the population lives below the poverty line. After the introduction of information technology in the pension system the verified number of the pensioners reached almost 80000.

The revenue reached almost 14 percent of the GDP in 2019 growing consistently since 2014 while the GDP growth is 2.9 percent. There is a provision of contribution in the pension law but is not enforced due institutional in capacities. The public pension fund is envisaged in new pension reforms which is parametric and increased the retirement age to 65 while decreasing the accrual and replacement rates. 27.3 billion Afghanis were paid in pension benefits in 2018 out of the total revenue (excluding grants) of Afs 189,605 million. Afghanistan has a serious issue of pension payment transfers due to undeveloped banking sector, capital and financial market. There are almost 0.6 million active civil servants in Afghanistan.

1.8.2 Bangladesh

Bangladesh has one of the fastest growing economic growths in South Asia. It has dramatically reduced the Poverty ($1.90 basis) at 14.8 percent in 2016/17. The GDP grew by 8.2 percent in FY2019 at 302 billion USD and remained 7.8 percent in FY2020. Bangladesh has the one of the highest rates of coresidence in the region. Elderly population constitutes 5.2 percent of overall population of Bangladesh. It is projected to reach 18 million by 2030 and 192 million in 2050. Bangladesh labor market is concentrated in the informal sector and thus majority of the elder population rely on informal income security like intra-family transfers.

The civil service pension system is publicly managed noncontributory defined benefit system and financed directly from national budget. The informal sector has no formal pension system rather gratuity benefit with a limited coverage. Private pension system is a success story with the remarkable achievements by “Microfinance Movement” which almost has a universal coverage with the different institutions offering short-term to medium-term saving products with returns. Grameen Pension Savings (GPS) provides saving products for 5 and 10 years period, with annual return ranging from 10-12 percent, which is not specific to retirement age however penalize the subscribers with lower interest rates in case of saving interruptions. This scheme has brought a significant relief to the older age poverty. In Bangladesh the women have higher life expectancy than men but lower working life than men. GPS attempts to protect the females vulnerable to such risks as well.

The number of civil servants increased exponentially and almost doubled between 1971 and 1986. The increase in the number of civil servants contracted in the early 1990s and since then it remains constant. The pensioners constitute about 29 percent of total active civil servants. The pension system has a replacement rate of 12.9 percent with the retirement age at 59 years. Bangladesh has better demographic profile with population ageing at a moderate rate. The pension system for the civil servants is characterized by generosity mainly due to the wage compression problem in civil services.

1.8.3 Bhutan

Bhutan is an exception as it never remained a colony of British and has fully funded pension system. It has a contributory pillar in it defined benefit pension scheme unlike many countries in the South Asia the Bhutan's pension system does not depend on the final salary drawn rather to the average increase in net wage of the civil servant. The current pension system started in 2001 and as it is a new system so the system dependency ratio is very satisfactory at the moment. The replace rate is 14.4 percent and has a generous pension benefits for the steep earners. Due to it contributory pillar the pension expenditure to revenue ration is not rising. Currently the GDP is growing at 2.4 percent. Still the government is considering parametric reforms in the pension system in Bhutan mainly due to the demographic projections and the maturity of the system. The old age dependency ratio would double in 2050 while.

The most important thing to note about the Bhutanese pension system is the availability of pension fund reserves to meet the pension liabilities. Also, Bhutan has least developed capital market structure so it invests the funds into diversified international portfolios. Almost 55 percent of the elderly population work and has the earning ability. Population ageing is rapid in Bhutan.

1.8.4 India

India is the most important country in the region with the largest population and biggest economy. The volume of the Indian GDP is USD 2.87 trillion. It has the most developed capital market structure than other countries in South Asia. It has a two pillar pension system and two pension system going on at the same time, one for the civil servants who joined the service before 2004 and one for new entrants in civil service after 2004.

The demographic profile is interesting with 90 million elder population which means that the one in eighth elder in the world live in India. The elder population is projected to reach 200 million by 2030 and 19.6 percent of total population in 2050. Less than 14 percent is covered by pension system. There are almost 30/450 million civil servants in India. The civil service pension was inherited from British since 1947. It was publicly managed unfunded defined benefit pension scheme. Pensioners constitute 61 percent of the overall civil servants. The pension expenditure for civil servant rose sharply (from USD 0.5 billion in 1981 to nearly USD 25 billion in 2010) and is continuously increasing to date. The ratio of pension expenditure to tax revenue has already surpassed average of developing countries almost 12 percent.

These projections compelled the Indian government to take reform measures and introduced the contributory New Pension Scheme (NPS) from 2004. NPS compels the new entrants in civil service to contribute for their pensions. The contribution goes to an independent regulator that implemented the NPS named as Pension Fund Regulatory and Development Authority. To date it has registered more the 20 million workers. PFRDA has a target of registering 30 million subscriber in 2020 and has extended its coverage to private sector on a very fast track with a provision of the portability of pension benefits from public to private sector and vice versa. PFRDA has also an ambitious target to include the Indian diaspora working abroad in the NPS. The government is trying to make deal with different countries on the matter.

According to studies the private pension would accumulate USD 300 billion by 2019-2020. The contributory pillar of the NPS would be fully funded in the future and according to sensible estimate the NPS has could reduce the long-term government liability by 10 percent. It is modernizing the landscape of the pension system India by expanding the pension system to the private sector. Funds accumulated through NPS would result in the development of a vibrant secondary mortgage market and developing a more market-based regulatory and supervisory approach for pension funds. Employers and employees contribute 10 percent of salary each in individual accounts. The minimum retirement age is 60 years taxed on EET principle, with mandatory annuitisation of 40 percent of accumulated capital.

India demographic projection is favorable in terms of the sustainability of the pension system. The most notable characteristics of the Indian NPS are that it transfers the demographic risks towards the workers. Also, NPS resulted in bringing down the replacement rate to 8.4 percent which is well below the average replacement rate in developing countries. Last but not the least; it is only India which indexes pension benefits to inflation. NPS need to cover the informal sector as well.

1.8.5 Maldives

Maldives is the smallest country in the South Asia with the total population of 0.53 million, GDP volume USD 5.72 billion and GDP growth rate of -11.3 percent in 2019. It has the highest per capita Gross National Income in the SAARC region. There is no concept of early leavers and most of the civil servants do quit the civil service and stay until the retirement age. The pension scheme is not indexed which results in very low pensions.

There is a basic pension system which is universal and almost convers the whole population. In case of missing the retirement facility, the civil servants are still eligible for basic pension. The retirement age is 65. Public services constitute almost 30 percent of the total jobs in and 7 percent of the active civil servants are civil servant pensioners. According to the data there were almost 22,000 civil servants in 2018. According to the demographic profile the population ageing is taking effect rapidly in Maldives.

1.8.6 Nepal

Nepal has a total population of 28.6 million with the GDP volume reaching almost USD 93 billion growing at a rate 2.3 percent. Almost 32 percent of the active civil servants are pensioners. It has publicly managed defined benefit pension system for the civil servants and a contributory provident fund system as well. Nepal has the highest contribution rate in South Asia which is 20 percent and replacement rate is almost 12 percent. Like other pension civil services pension systems in South Asia it is also generous in term of pension benefits mainly due to the wage compression in civil service. Nepal has more poverty among the older age population and thus the importance of pension reform stands more important.

1.8.7 Pakistan

Pakistan is another key player in the South Asian economy. It has a population of 216.5 million where the older age constitutes about 4.3 percent of the total population. Poverty among the old age is below the average poverty line. Pakistan inherited publicly managed unfunded defined benefit pension system form British rulers in 1947. It also has contributory provident scheme for the civil servants. The number of pensioner is growing fast and almost there half the number of active civil servants who are pensioners and the replacement rate is 10.6 percent. With the increase in the number of pensioners the pension expenditures is also growing fast as it has already touched the 8 percent of the revenue which is very high. Pakistan is keen in reforming the pension system and has taken different measure to introduce a comprehensive reform package.

The province of Khyber PakhtunKhwa (KPK) has already increased the retirement age from 60 year to 63 years and the province of Punjab is considering the same move. The federal government has already taken different parametric reform measures to mitigate the fiscal pressure caused by the pension expenditurein 2001 the government offered the civil servants to either to accept higher wage and lower pension or stay in the same pension structure. Also during the same the restoration of pension benefits were changed in the light of parametric reforms and the pension benefits were capped at the maximum 30 years of pensionable service in terms of pension calculation. There is long-run as well as short-run association of both government pension expenditures and general provident funds with increase in average life expectancy, old-age dependency ratio and total population of the country.

1.8.8 Sri Lanka

Sri Lanka has faced 30 years of civil unrest and poor law and order situations until 2009 when the peace deal was signed. Sri Lanka hast a population of almost 21 million and the GDP growth rate is -6.1 percent in the year 2019 mainly due to Covid-19. Its pension system has coverage of about 30 percent. Sri Lanka is ageing rapidly with the old age dependency ratio increasing at 2.6 ration factor till 2045. Sri Lanka has one of the highest rates of co-residence in South Asia while the poverty rate among the old age is below the national average. Currently the number of pensioners is almost 48 percent of the active civil servants. Sri Lanka has the highest replacement rate i.e 16.8 percent. It has introduced contributory component toward future pension benefits in 2004.

Like India, it is mandatory for all new civil servants joining the civil services after 2003 to contribute for their pension benefits. The new defined contribution scheme would start showing a deficit in next four to five decades mainly due to the design of pension system as it does not transfer the demographics risks to the working population. Currently the pension expenditure as a share of government revenue is very high almost 11 percent and it would be much greater as more than 400,000 pensioners would be entering in to the pension system during 2036 to 2046. However the reforms could reduce the government liability by 8 percent.

In Sri Lanka the government job is the major source of employment and the government provides job opportunities to curtail the unemployment rate. This way the pension liabilities increase manifolds. It is the only country in SAARC region that has covered the informal sector working in the agricultural sector with the national pension system. The success is mainly due to stronger human capital, formalization of economy and broad participation of farmer in the pension scheme.

The south Asian civil service pension system has been studied by key international organizations like the World Bank and the Asian Development Bank. It can be learned from the above that reforms and different studies by the WB and ADBthat the pension reforms need to be compliant with the local conditions and according to the requirements of each country. Each member country has its own economic, fiscal, political and social dynamics that have deep impact on the pace of the reform process and its success. There are two reform methods; parametric reforms and systemic reforms and both have its own dynamics that may suit one country at a time while having a counterfactual effect in other country. Systemic reform suits best the countries where the initial requirements like developed capital market structure, better governance arrangements, professional expertise and institutional capacity are up to mark and government can divert huge transition financing. Unlike systemic reforms, parametric reforms do not need major overhauling as required and government starts with small steps to reduce pension obligations by changing the pension parameters.

This is why different countries different countries focus on different types of pension schemes at the same time. Even in the developed counties like Hungary, Poland and Sweden the fully funded privately managed defined contribution plays a minor role while the defined benefit covers major pinions benefits but in countries like Chile and Colombia the privately managed defined contribution scheme dominates. So South Asia has also the mixed or hybrid pension schemes where the defined benefit and defined contribution schemes are praised with different proportion.

Like other regions, South Asia has different local conditions requiring different approaches and policy measures to deal with pension schemes. Based on those factors, different countries have different mixture of pension schemes. Bhutan has a hybrid pension scheme with defined contribution scheme that could invest in foreign assets and the defined benefit scheme introduced in 2001. Bhutan has immature capital market and lacks a team of professional asset managers to manage the funded system. it is due to the fact that Bhutan is still at the initial stages of the economic development. Parametric reforms suits best the Bhutanese reform agenda until it develops the required conditions. Bhutan is one of the relevant examples of a country having a defined contribution scheme where the local capital market conditions are not developed.

Afghanistan has survived through ages of civil war that destructed the whole economy and the administration setup. At the moment, Afghanistan is on its way to improve the institutional capacity to manage both the pension schemes and the reform the civil service.

India is the most important country in the region due to its huge economy. It has the largest civil servants in number and has better capital market conditions, well defined governance structure, institutional capacity and required human capital to bring systemic reforms. Both India and Pakistan have the concept of federating units where the parallel pension schemes work both at the national and sub national level at the same time. There are huge variations among different states pension systems. The military pension also plays huge role in defining the pension expenditure and very limited data is available in this regard.

Sri Lanka has the most suitable conditions for the reforms as its demographic patterns are changing fast. The new pension scheme for the new entrants promotes the contributory pension scheme but is managed by the government with rigorous investment limitations. The case of India is Sri Lanka is very prominent example of different approaches to defined benefit and defined contribution schemes. Sri Lanka has the provision of exempt pension fund system known as approved private provident funds but its performance has always been under question. It was proposed to work under the Central Board of Trustees.

Pakistan has a defined benefit pension scheme for the civil servants. The General Provident is a quasi-defined contribution scheme managed by the government with no defined investment strategy. It needs a minor change in designing a robust investment strategy for the already contributory scheme. Like India Pakistan also has different provinces having their own pension schemes but all are defined benefit schemes. Also, the military pension enjoys huge share of overall pension expenditure. Pakistan’s capital market structure is not very developed and has restrictions on investments to foreign assets. Like Sri Lanka, parametric reforms suit Pakistan’s economy best.

Maldives is a small country with its unique local dynamics. It has the largest share of civil servants in the formal sector employment. It has a suitable condition for systemic reforms. There is a defined contribution scheme well in place which covers the majority of civil servants. Maldives investment law allows investment in foreign markets as well. So the experience of managing defined contribution scheme gives an edge to shift to a fully funded pension scheme with no restrictions on investments in foreign markets.

Table 1-2 Details of Pension Systems in SAARC countries

Country	DB/DC rates	Eligibility/ Years of service	Retirement age	Replacement rate	Earning base	Indexation	Commutation factor
Afghanistan	DB	25 Years	65**	**8.4**	Final Salary	Ad hoc	None
Bangladesh	DB; None DC; 2-10 percent	25 years	59*	12.9	Final salary	Discretionary	50 percent
Bhutan	DB; 10 percent DC; 6-10 percent	* 10 years of contribution	56	14.5	Lifetime wage average	Net wage	None
India	DB; None DC; 6-8 percent	None	60	8.4	Final 10 month salary	CPI and discretion	40 percent
Maldives	DB; None DC; Voluntary	20 years	65***	-	Final salary	Discretionary	None
Nepal	DB; None DC; 20 percent	None	58	11.9	Final salary	2/3 of wage	None
Pakistan	DB; None DC; 3-8 percent	25 years	60	10.6	Final salary	Ad hoc	40 percent
Sri Lanka	DB; None DC; None	10 years	60	16.8	Final salary	Discretionary	None

* Ammended in 2011
** as per new pension reforms (Fiscal Strategy Paper Medium Term Fiscal Framework 1399 / 2020)
*** amenden in 2014 civil service regulation 2014.

1.9 Objective of the Study

- To examine the impact of population ageing on general pension expenditure in SAARC countries.
- To examine the impact of corruption on general pension expenditure in SAARC countries.
- To assess the dynamics of civil service pension system in the SAARC member countries

The sequence of the paper would be as follow. Chapter 2 will provide with the review and discussion on past studies and literature paving a case for the overview of the research gap. Chapter 3 discusses the data methodology and econometric model. The estimation and results of the model would be discussed in Chapter 4 while the chapter 5 ends with the conclusion.

CHAPTER 2

LITERATURE REVIEW

There is a dearth of literature on the topic. Only two significant contributions are available at the moment i.e the paper by the World Bank 2005 which focuses on the formal sector pension system in South Asia and it relates to this paper most. Another paper is the brief of South Asia Pension Forum (Kim 2011) which updates the World Bank study in depth and with breadth. Some instant papers have covered some aspect of specific SAARC countries which is of lesser relevance to this paper.

Pension has been defined in different words and different context. Depending on the definition and objectives, the scope and outcome of a good pension system may easily be assessed. According to the (Holzmann, 2005) "the primary goals of a pension system should be to provide adequate, affordable, sustainable, and robust retirement income" considered as Pension scheme. One of the researches stated that productivity of the public work force will increase due to the pension schemes. According to them employees who are more productive should be more compensated. However, it doesn't mean that productivity always line up with compensation in every moment and it can be paid the along the service period of the employee.

The structure of compensation package can create the productivity and the retention of the job of the employees. Another study found out that pension can have an impact on children's wellbeing. The study done in South Africa and Brazil observed that there was a significant improvement of height of the children resulting of the pension payments. Girls in the household containing an older person receiving a pension are 3-4 cm taller than the girls in the other households as a result of improved nutrition. Simultaneously in the same countries access to the education of the children improved in the person living in the household where a person receiving a pension rather than the other households.

There are many papers that have focused on the regions. Civil Service Pension in countries like France, Germany, Netherlands, Sweden and UK was studied by (Ekebrand, 1997) and pointed out that design of the Civil Service Pension Schemes should ensure the flexibility, stability and the security of the system as well as the simplicity. Another paper studied the features of public pension systems in ten OECD countries in 1997 (Kalisch & David &Aman, 1998). These countries were Albania, Bulgaria, The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia and pointed out the importance of a civil service pension system through separate legislation.

Another major paper studied 53 countries form different parts of the world (Whitehouse, 2007) and found out three main differences among the Civil Service Pension systems namely target replacement rates, pension redistribution and portability of pension benefits. Another important study on seven countries Canada, Germany, Italy, France, Japan, UK and USA (Noord, et al., 1993) showed that pension expenditure had steadily increased due to population ageing and the coverage of the pension has also been increasing. According to another survey (Iyer, 1993) found that most of the developing countries have defined benefit pension scheme.

A paper on India focuses on the effects of retirement (Dhillon &Preet, 2005). However, they further observed that financial security and the health condition are the common factors that are highly relates to the wellbeing of the retiree. Another study found that the civil service pension is generous and is distinct in nature. Similarly, (Palacios & Whitehouse, 2006) found that civil service pension is the more generous, less financially viable and crowds out key social programs. The paper tries to analyze the link between pension entitlement at the retirement and the employment earnings over the period of time.

Another paper argues that adverse effect of future announcement cuts in pension benefit on the consumption can be moderated through tax relieves measure. On the other hand, some papers conclude that it is pragmatic to increase the retirement age as it helps to accelerate growth and improve the public debt dynamics. Increasing the retirement age has a positive effect on the GDP growth as the increase in pensionable age is a part of reform measures to balance the function and operations of pension mechanism. It is easier and less volatile than raising the taxes and lowering the replacement rates. Effective working life in terms of increasing the retirement age improves the public debt dynamics in the UK and most European countries. As workers are tempted to increase their consumption patterns inspired by the potential prospective income increment as they work longer while saving less. In the long-run, labor and capital are the important determinants of improvement in GDP. On the average, especially in case of European economies, the increase in pension would result in the reduction of budget deficit and public indebtedness if the tax rate and spending patterns remains constant.

Defined benefit type of pension system and its importance in civil service. They maintain that sometimes mid-career employees may will to resign their job for the different job; however they have to give up the large portion of their differed compensation as pension benefits. The dynamics of defined benefit pension system system helps to address the issue of job evaluation and disposal of workload. Most of the East European countries have the provision of personal account for the disbursal and accounting of the pension benefits. Pension expenditure is meant and introduced to alleviate the poverty and provide income security after retirement. It is a major impediment in the way of pension objectives but low spending does not tantamount to pension objectives. It could be concluded that a real pension system serving its objectives and purpose is not the one controlling expenditure or providing low pension but achieving the goals of poverty alleviation and income security while not putting stress on the fiscal and financial affairs.

Civil servants generally like to be entitled to the defined benefit pension system as it has the advantage of being generous and it is not exposed to the investment and return risks and thus the case for a defined benefit pension system for the civil servants remain intact. While studying the pension system of the civil servants in Pakistan it was found that there is positive and strong relationship between the pension expenditure and life expectancy, old-age dependency ratio and population in Pakistan both in long run and short run (Wahab et al. 2017).

Defined benefit schemes, in simplest works, the calculation based on average earnings and years of pensionable service multiplied with the “generosity” of the pension plan (Barnow and Ehrenberg, 1979). The scheme focuses to provide with assured and has higher replacement rate with the objective to protect the pension benefit fluctuations emanating from inflation and wage adjustments Blake (2000). Defined-benefits are based on calculation of the closing salary and give the individual to sustain till last incremental benefit in the wage since the increase in the final salary has a greater effect on the pension-benefits (Bodie, et al, 1988) thus defined-benefit scheme propels insurance of income in post-retirement period.

They also find that defined benefit is not favorable for those employees who could not stay longer in the job due to situation not in their control and due to strict eligibility criteria and vesting period generally associated with the defined benefit scheme the employee's accrued benefits are gone. Also the employee may bear the risk of pension benefits due to the insolvency risk on the employer's side. Defined benefit schemes has a great advantage in terms of protection for the old age population who have lesser advantage adjust their economic condition with the adverse economic situation or to recoup their consumption poser through earning (World Bank, 1994).

Barr and Diamond (2006) define it as the system which can be administered either by the state or by employers. In case it defined benefit system is being run by the state then the risk is shifted on current contributors, in most cases the current workers who contribute through payroll taxes. Or the risk is transferred to the tax payers if the scheme is financed directly from the budget. In case the defined benefit scheme is administered by the employer or is an employer defined benefit scheme then the risk of the required return for pension benefit is bore by the employer.

Generally it is agreed that the risks of benefit payments always lie on the employer while the employees bear the inflation risk, if the scheme is not indexed with inflation, as the increase in consumer price index would lower the purchasing power of the pensioner effecting he smooth consumption badly (Broadbent, Palumbo and Woodman, 2006). In a pure DB scheme, therefore, none of the risks fall directly on pensioners Barr and Diamond (2006) find that the despite various risks revolving around the defined benefit scheme, mostly no risk fall directly on the pensioners in general. (World Bank, 1994) highlights the possible risk that the employee may face also include the risk associated to the tax revenue as the government may face risk of tax collection depending on the circumstances. Also the change in political setup may also alter the pension benefits at the cost of current employees as with the change of government the policies also change.

Defined Contribution pension system is the pension system in which the contribution is defined in advance but the benefit depends on the returns and years of contribution (World Bank 1994). It has also been defined as the subscriber's account where the fixed fraction of earnings is paid for the ease of calculation Barr (2002a). The accumulated payment in the respective accounts is pooled to purchase assets as a part of investment plan to earn returns for the subscribers (Barr and Diamond 2006). On attaining the age of retirement or when the subscriber becomes eligible for the payment of pension, the principal amount and the interest could be paid in lump sum or an annuity (Bodie, Marcus and Merton, 1988). Based on these characteristics this type of pension system has been termed as money purchase pension plan (Blake 2000).

The effectiveness and efficiency of defined contribution scheme largely depend on the design and availability of investment choices for the fund and it can better be achieved with effective regulation and legislation Byrne, Harrison and Blake (2008). It has also been found that employees in the middle and lower income strata get lesser retirement income in defined contribution plans than defined benefit plans and is mainly dependent on the employer contributions. Women get lower pension benefits in this scheme as evident from a study in USA and points out that women being more risk averse than men have contribute lesser portion of their wealth in defined contribution schemes.

The gender differences were small in the case of Sweden with higher income variance among the private sector employees (Carlsson, Erlandzon, and Gustafsson, 2008). Defined contribution schemes have an uncertainty factor due to various market and macro forces and this way the future benefit flows remain unpredictable (Bodie, Marcus and Merton, 1988). In addition to contribution for future income security the participants have to subscribe for disability health and life insurance (Diamond, 1977).

Thus transfer the return risks to the workers (Samwick and Skinner, 1998). Grande and Visco (2011) assessed the impact of global financial crisis in 2009 on the pension systems and found that defined contribution schemes are exposed to financial market tail risks which may result in greater loss for the participants in worst case scenario and the paper suggest the provision of minimum return guaranteed by the government for the scheme members.

Other risks associated with the defined contribution schemes have been studied by various papers. (Barr and Diamond, 2006) focused on the real rates of return, future earning trajectories and annuities. Similarly another paper found the effects of financial risk, agency risk, longevity risk, market risks and fraud risks (Holzmann, Hinz and Dorfman, 2008). The political risk has been studied in a publicly mange defined contribution fund and found that the investment risk is associated with the political risk (World Bank 1994).

Also the risks associated with the management of the contribution funds have a direct impact on the efficacy of the system (Orszag and Stiglitz, 2001). Another study finds that defined contribution schemes are not risker than defined benefit schemes due to its low costs both in terms of saving and administration Watson (2008). However defined contribution schemes become risky during the accumulation period which is not in case of defined benefit schemes But Blake, Cairns and Dowd (2001). Despite these deficiencies and other reasons for the low performance of the defined contribution schemes, highly qualified young workers with higher earnings still have significant inclination towards choosing defined contribution schemes (Bodie, Marcus and Merton, 1988).

Defined contribution plans have the advantage of portability as the balance of individual's account is known at any given time Blake (2000) and the administrative decentralization of funds would promote competition in investment and returns (Thompson, 2000). The investment performance and overall effectiveness of defined contribution scheme depend on the level of contribution, financial returns and benefit ratio (Holzmann, Hinz and Dorfman, 2008) while resulting in the development of financial markets. Overall, defined contribution schemes provide a disciplined functioning to the mutual fund portfolio management as it has less autocorrelation and is sensitive to performance (Sialm, Starks and Zhang, 2015).

There have been many studies on Pay-As-You-go (PAYG) as well, Feldstein (1974) calls PAYG a mechanism in which the social security contributions are used to pay concurrent benefits. PAYG system has been defined by many researchers in in different contexts; some refer PAYG as payroll tax collected for the payment of pension benefits to retirees De La Croix and Michel (2002) and some call it a redistribution and risk sharing mechanism across generations Barr and Diamond (2006) while it is run by the state.

Blake (2000) argues that minimum welfare standards are achieved via income redistribution in PAYG pension scheme. Other researchers assume that the revenue generated to pay the pension expenditure equals the pension expenditure Aaron (1982). PAYG benefits the older age cohort and concurrent pensioners as they get back a higher present value of pensions than their contributions and it is explicit in case of increasing rate of labour force than the rate of increments in pension payments Samuelson (1958) and Aaron (1966). They add that the pension benefits would be enormous if the earnings growth rates greatly exceed the interest rate. The disadvantages of PAYG range from deadweight loss in terms of marginal tax rates, labour supply distortions to lowering national savings rate (Dutta, Kapur, and Orszag, 2000), (Bovenberg and Knaap, 2005) and (Barr and Diamond, 2009) and research like (Sinn, 2000) finds PAYG inefficient system and a zero-sum game between the generations as the tax burdens resulting from respecting pension claims and payments remains intact. Börsch-Supan (2006) PAYG mechanism automatically obeys the annual budget restriction.

However the fiscal sustainability of PAYG system is very sensitive to Old-age Dependency Ratio (ODR) as the low ODR leads to higher benefits or low contribution (World Bank, 1994). Other factor resulting in low pension benefits have been explored by Sinn (2006) which include; declining population growth, lower induction of labor force in contribution pool, lower rate of return and lower fertility rates.

They conclude that the PAYG system suits the country not ridden by the above factors and is cheaper than fully funded plan but until it matures. Despite many arguments on the comparison between PAYG and funded pension system, (Barr, 2002b) concludes it in a short and crispy ways “both have strengths and weaknesses, if effectively managed, and used in the correct economic circumstances”. He explores and discusses the myths revolving around the PAYG and fully funded system (Barr, 2001b) and finds that demographics is the gauge for the utility and validity of the each pension system and proposes the “tiers” system.

Pension reforms around the world focused on switching from PAYG system to a fully funded system. The dynamics of these reforms and changes have been discussed by many papers. Brown (1995) highlights the transition cost in terms of generation that is if already invoked PAYG system is replaced with the fully funded system as one generation has to make double contribution; one for paying the current pension benefits and other for prefunding the pension system. He proposes to expand the coverage of PAYG greatly to divide the burden. Another solution is the introduction of investment-based saving accounts for each individual (Feldstein and Liebman, 2002).

Vidal-Meliá, Boado-Penas, and Settergren, (2009; 2010) propose an automatic balance mechanism (ABM) to ensure the financial equilibrium of PAYG pension systems. It accounts for the changes in socio-economic and demographic conditions and guarantees the promises of pension payments via workable institutional framework. Sinn (2000) finds that there is no gain from a transition to a funded system in PV terms. Studies like Haberman and Zimbidis (2002), Pantelous and Zimbidis (2008) and Gannon, Legros, Touzé (2013) persuade for parametric reforms in PAYG pension systems if the required conditions for switching to a new system is not prevalent. Their proposals focus on the establishment of contingency fund as it can be a buffer and liquidity risk absorbent (Pantelous and Zimbidis, 2008). Gannon, Legros, Touzé (2013) focus on inter-temporal budget balance to equate the promised future expenditures in line with expected future revenues.

Of the most important findings concludes that the PAYG system is not an issue as long as the debt-to-GDP ratio and the pension expenditure to contribution ratio are not growing excessively (Barr and Diamond 2009).

Notional defined contribution system has been introduced to overcome the deficiencies and weaknesses of the defined benefit, defined contribution and PAYG pension system. It was presented by Buchanan (1968) with a focus on the non-financial aspect of the contribution system since no financial transaction and contribution taking place so the contribution account is set to be called notional. Due to this characteristic it is sometimes referred as parallel defined contribution system as there exists individual’s account with contributions being accumulated and the benefits are accrued as per the accumulated contributions and interest rates Barr (2006a) and Barr and Diamond (2006).

Notional account is converted into annuity and is meant for record keeping and unlike defined contribution accumulated contribution is not invested. Börsch-Supan (2006) highlights the advantages of the NDC system. he argues that the NDC system can function automatically as it provides lesser avenues for intervention in terms of investment choices and demographic changes. As the set formula for the contributions accrued are dependent on the years of service and contribution rates so the system automatically penalize the early leavers thus addressing the longevity problem. It avoids arbitrariness of benefit indexation rules and adjustment factors as there is no rely on the last pay drawn or average wage criteria.

It calculates the individual contributions while the incorporating the benefits through the interest rates defined by the states hence there is no issue of the credibility thus it can be imitated into the accounting system of the PAYG system as the interest rate is decided by the government in both cases. Thus the NDC system has the advantages of portability and choice of leaving early. Unlike the PAYG system there is no discretionary or hidden decisions as everything is evident in terms of life table, computation rules, minimum retirement age, and so on. NDC has the benefit in terms of addressing the longevity problem as it reduces the benefit (Sarah and Kent, 2005). This way the rate of pension contribution is stabilized thus the pension values are not eroded in case of population ageing and late retirement.

To overcome the issues of different pension systems, World Bank introduced the multi-pillar approach as one of the best and workable alternatives (Holzmann, et al, 2008). World Bank (1994) introduced the combination of different tiers with specific objectives to cover different aspects of the pension objectives; mandatory tier which is managed by the state is financed through tax meant for redistribution, mandatory fully funded tier which is managed by private entities meant for saving and the third tier is voluntary meant for providing insurance. Weaver (1998) argues that the public pensions focus on poverty reduction through three pillars. The combination of these tiers or the combination of these pension types would be general but focuses on the redistribution – low income old age pensioners (James, 1998). The second pillar consists of individual accounts which are fully funded by the contribution of each individual for their retirement period.

There is also a view that the top pillars may be provident fund systems, with an offer of either an annuity purchase or either individual financial account systems with investment in private market funds. The third pillar is voluntary however it is contributory and this pension provision is meant to supply extra retirement income other than provided by above two pillars suggested by (Willmore, 2007). Gent (2000) resembles it with occupational pension schemes. The amalgam of the first pillar of PAYG and the second pillar is most populous among countries studied by (Gent, 2000). Later on, World Bank added two more pillars to ensure the poverty alleviation which are “zero pillar” know as non-contributory and a non-financial pillar (Holzmann, 2005) and (Holzmann et al., 2008).

The fourth pillar, which is non-financial, resembles the mechanism or system to defining the dynamics of the informal support (family support due to joint family system or co-residence or etc), social security programmes (provision of healthcare and housing facilities) and other forms of asset accumulation at individual level (buying home or reverse mortgage). Holzmann et al.,(2008) found that it has a direct relationship with the design and implementation of the other pillars and pension benefits or target benefit levels.

The relationship between population ageing and pension system has been studied by various researchers. Leers et al.,(1998) suggested that ageing has different impact level in a small open economy where the pension system is defined benefit PAYG. In such cases the pension reforms depend on the political economy and the treatment of the institutional savings mechanism to win the trust of the future generations. This way the economy would stuck in the saving trap of existing saving without subsidies to provide a cushion to the saving mechanism. Some researcher such as (Giang, 2004) suggested that ageing becomes a vicious cycle of inequality in terms of intergenerational transfers like Vietnam where the pension system is financially sustainable and unstable.

Consideration of some authors like (Hagemann and Nicoletti, 1989) and Marchand and Pestieau (1991) propound that demographic changes are smooth, definite and foreseeable. Instead of increasing the legal retirement age it is better to transfer the effects of population ageing into the contribution rates to make the future reforms easier concluded by Lacomba and Lagos (2006). According to McCarthy and Zheng (1996) the pension system is unsustainable, financially, in China mainly due to population ageing, even though GDP grows smoothly over a long period. The problem is not the rising life expectancy but the increasing numbers of pensioners and longer retirement age.

The civil service pension system has been studied in various capacities. The public pension systems in OECD countries have been studied by (Kalisch and Aman, 1998). The public pension schemes in ten central eastern European countries (Albania, Bulgaria, The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia) are analyzed in detail (OECD, 1997). Most of these countries studied have national pension schemes which are defined and implemented by the pension laws. Many countries are trying to link and define civil service pension through civil service legislation, professionalization and quality of public administration. Another study focusing on the West European countries like United Kingdom, Germany, Netherlands, Sweden and France concluded that the civil service pension system need to be designed such that it is stable, secure and flexible (Ekebrand , 1997). The paper also proposed that the civil service pension should be simple and easy to understand and administer while the linkages between earnings and pensions is definite and well understood.

Another key paper studied the pension system of 53 countries (Palacios and Whitehouse, 2006). These countries included 24 OECD countries, 9 Latin American and Caribbean countries, 10 Eastern Europe and Central Asian countries and 10 Middle East and North African countries. The main objective of the paper was to study the linkages between the working life earning and the pension benefits entitled during the pension life while assessing the philosophical background behind each pension systems in these countries. The paper also studied the dynamics of pension expenditures in these countries and found that the pension system for the civil servants are more generous and less financially viable than those covering the rest of the formal sector or private sectors, in most of these countries. So, they conclude that without reforming the civil service pension system there are great chances of crowding out the funds for important social programs.

While studying the retirement schemes of 53 countries (Whitehouse, 2007) found three key differences amongst these retirement schemes;

- First, the target replacement rate varies from country to country and it ranges from 30 percent in Ireland to 116 percent in Iran. Regionally, Middle East and North African region seem to have the highest replacement rates as compared to other regions under study. USA, Australia, Mexico and Djibouti have the replacement rates around 40 percent or lesser.

- The second difference lies in the pension adequacy or redistribution versus target replacement rates. Generally, there is no linkage between the pension benefits and pre-retirement earnings which mainly due to the over-emphasis on the adequacy of pension system with its redistributive feature. This way the replacement rate is generally higher for employees having low earning profile. However, countries in Middle East, Continental Europe and North Africa, focus on the provision of similar pension benefits or replacement rates for all employees.
- The third difference lies around the provision of private pension system by private sector. Especially, in Middle East and North Africa there is almost no private sector pension system for the employees. However, almost in 33 percent of the high-income OECD countries private sector has deep involvement in the provision of pension packages for the employees.

The pension liabilities of seven major countries - Canada, France, Germany, Italy, Japan, United Kingdom and United States are studied by (Noord & Herd, 1993). They find that population ageing and increasing pension coverage have caused a major increase in the pension expenditure during 1980's. The institutionalized pension scheme of developing countries and a few countries have the defined contribution national provident fund model with a variation studied by Iyer (1993). According to some authors wellbeing of retiree is dependent on the financial security and health of the retiree (Dhillon and Shyodan Singh, 2005). They conclude that there is a gender face of retirement as well as the retirement affects men badly in India as compared to women despite the existence of gender differences.

In 1999 the Government of India established a study group under the Shri. A. M. Sehgal to study the pension liabilities. The report proposed the formation of a mixed two-pillar pension system having the defined benefit and defined contribution components at the same time. The repost was submitted in 2001 and the proposal for the new defined contribution component was meant for the new civil servants joining the service after 2004. The first pillar is mandatory and covers the contribution rate and the benefit rate. The repost recommended the minimum eligibility criteria in terms of years of service with the provision of exit rules. It also proposed the indexation of inflation up to 5 percent per annum. The second pillar is a voluntary component and is more like a saving mechanism but is based on the matching principle with the government contributing up to a 5 per cent while the employees contribute at least 2 percent with no upper limit for the contribution (GOI 2002). However the Government of India introduced and implemented a comprehensive defined contribution system in 2004, it was not as per the proposal of the report to go for a hybrid defined benefit and defined contribution system. Anand and Ahuja (2004) found that the reforms entail inter-generation planning for long-term fiscal consolidation and start yielding benefits only after 35 years or so. Pronab and Swain (2012) link the future Government employment and pension liabilities through manpower planning in Government.

Schwarz and Demirgüç-Kunt (1999) focused on the pension reforms of different countries taken up in 1992-98. They found that the pension reforms differ greatly from country to country and the highest rate of reform measures is common in the countries where demographic changes is taking place at a faster pace. In the list of pension reforms taking place at a faster pace include former socialist countries (which has their own pension systems) at top while the countries in Latin America is second on the list followed by the industrialized countries. The demographic changes is not a major concern in Asia, Africa, Middle East and Sub-Saharan Africa so the reforms measures are not taking place as there seem to be no urgency. The Latin American countries are switching from the publicly managed defined benefit PAYG pension systems to a privately managed multi-pillar pension systems. Also Eastern Europe and Sub-Saharan Africa are changing their pension systems.

Australia added a fully funded defined contribution component second pillar to the defined benefit pension system finance from the budget and was based on the means-testing. Sweden’ reform measure is shifting the publicly-managed defined benefit PAYG to notionally financed PAYG account system while introducing a small funded defined contribution component. The government in U.K., came up with an idea of giving options to the individuals to substituting their pension for the publicly provided earnings related benefit. The Middle East and Asia has shown very minor or negligible pension reforms. However the some reform measures focused on the introduction or formation of new pay-as-you-go pension systems or other schemes similar to these. They concluded that the reform measures vary and differ across the regions on various accounts. However the major reforms measure was taking place in the minor changes in the existing public pensions. It looks as various reforms are taking place around the world but it is important to note that most of these reforms are related to the minor changes in the current pension system and an overwhelming majority of the reforms are focused on reducing the fiscal pressures of the existing pension systems.

OECD (2009; 2013) analyzed the pension reforms in OECD countries and stated that there are 34 countries of OECD which have made reforms. They found two main trends. First, delaying in retirement age, the pension is higher, indexation rules and adjustment mechanism. Second trend is that government is government is looking towards private pension arrangements. DC pension schemes have been introduced by Czech Republic, Israel and UK. While this scheme has been closed or reduced by Hungary and Poland.

In past two decades pension reforms which has been made by OECD countries lowers the pension promise for the workers. Reduction in pension can be mead by working longer but contribution in pension every year makes it benefits lower. The future pension will be helpful to lower the earnings, while lowest earner can get benefit in most of the countries except in Sweden. For the improvement of long term financial stability of the pension system and for savings in the financial budget, OECD countries have passed pension reforms continually. Although these reforms effects and goals may vary among countries and their income level (OECD, 2009; 2013).

Barrientos (1996) stated that personal pension gap has been found in Chile which directly effects the lower paid job person, informal sector, self-employed person and women. Poverty and welfare expenditure has been increased through these pension gaps. So the author suggested that they should use Chilean model of pension which lead them towards development and help them to solve these types of problems. Edward (1998) stated in his study that Chilean pension reforms are a success because they replace the PAYG pension system which is biased, inefficient and insolvent system. But there are some drawbacks as well like there is no any multiple fund and benefits provided by the government, but this can be improve by government.

Palacios and Whitehouse (2006) suggested following reforms to reduce pension liabilities:

- To increase the age of retirement;
- To reduce the rates of replacement;
- In pension benefit include the average service period;
- To index the CPI with pension benefits than salary increments;
- To introduce the pension contributions from members.

They believe that the civil service pension should be integrated with other pension scheme through parametric reforms. The integration of the pension systems would increase the benefits for any reform measure meant to improve the credibility and solvency of the main national scheme. To conclude the discussion, they find that the reform measures need to be holistic and not in bits and pieces. The pension reforms in India studied by (Asher and Vasudevan, 2004) also concluded that the reforms of civil service pension system would be comprehensive when extended to the state level as the defined contribution component is currently missing in case of pension system in states. They add that the states face resource constraints in order to implement such measures and especially in case of states with very low labor force. It is not advisable to restructure the pension system just for the sake of making it funded and solvent and diverting the necessary attention from key public policy areas.

Another study on the civil servants pension systems of selected Asian countries by (Asher and Parulian, 2015) and find that the civil service pension reforms are very similar to other pension reforms. They conclude that the dynamics of the pension reforms are not very different on the basis of its design, feature and type as almost all pension systems have the same objectives, goals and basis. However, the paper gives a special importance to the provision of the healthcare for civil servants as a part of the civil service pension reforms.

2.1 Research Gap

As discussed above there is a dearth of studies at a regional level in South Asia. The two key papers i.e World Bank 2005 and South Asia Pension Forum (Kim 2011) have covered only some aspects of specific SAARC countries. These are general discussions and no empirical research has been carried out so this paper attempts to fill the gap by studying the relationship between demography and civil service pension system empirically.

2.2 Contribution of this Paper

This paper contributes to the existence literature on the regional studies on the civil service pension schemes and it relationship with the demographic changes.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Econometric Model

The Statistical model for analysis can be defined as:

The general form of model is given below.

$$GPE_t = f(LE_t, POP_t, ODR_t, INF_t, GDP_t, UMP_t)$$

Where,

GDP= Gross Domestic Product

GPE= General pension expenditure

INF= Inflation

LE= average life expectancy

ODR = Old-age Dependency Ratio

POP= Old age dependency ratio

UMP= Unemployment

$$GPE_t = \beta_0 + B_1 LE_t + \beta_2 POP_t + \beta_3 ODR_t --- + \varepsilon_t \dots\dots\dots\dots (3.1)$$

We have used ARDL technique for co-integration.

$$LnGPE_t = \alpha_0 + \sum_{i=0}^{l} \theta i LE_{t-i} + \sum_{i=0}^{m} \gamma i POP_{t-i} + \sum_{i=0}^{n} \vartheta i ODR_{t-i} + \sum_{i=o}^{o} \varphi i INF_{t-i} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.2)$$

Here, l,m,n and are the numbers of lags of explanatory and dependent variables.

After checking the long run relationship, we have analyzed the short run dynamics and convergence towards the long run equilibrium through Error Correction Model (ECM). The ECM for all four equations is given as:

$$\Delta LnGPE_t = \alpha_0 + \sum_{i=0}^{l} \theta i \Delta LE_{t-i} + \sum_{i=0}^{m} \gamma i \Delta POP_{t-i} + \sum_{i=0}^{n} \vartheta i INF_{t-i} + \sum_{i=o}^{o} \varphi i \Delta GPE_{t-i} + \pi e\hat{}_{t-1} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.3)$$

Generally, the long panel dataset has been estimated through fixed effect, random effect and Arellano-Bond estimators. Fixed effect is restrictive as it assumes that model parameters are fixed and in panel data it represents the subject specific means thus one intercept for each variable. On the other hand the random effect model is the one in which one or all the model parameters are random. The issue of autocorrelation and endogeneity are dealt through GMM and has been appropriate in cases with small time series but large cross sectional units.

It is pragmatic to assume that the slope coefficients are constant and homogenous in case of large panel data in short run estimations. However, the estimates would be inconsistent and biased in case of heterogeneous slope parameters. Violation of this assumption would result in heterogeneous panel data. In case of heterogeneous panel data the resultant estimate would be inconsistent and unbiased until the panel is segregated by the short and long panel based on the time horizon and number of cross sectional observations i.e long panel are those in which the number of time horizons exceed the cross sectional observations and is short panel if vice versa. However, the time horizon would be the only criteria for estimation in case of an individual cross section with very long panel thus homogeneity of the slopes cannot be well assumed. This is why the fixed effect or random effect techniques would give misleading estimates in case of large panels.

The assumption of the homogeneity can be tackled through: Mean Group (MG) estimator and Pooled Mean Group (PMG) which is discussed below.

3.2 Mean Group (MG)

It is not restrictive and allows separate regressions for each country. Then the coefficients are calculated as the unweight means of the estimated coefficients for the individual countries. MG estimation allows the variability in intercept and slope for the group of panel dataset both in long run and short run. This technique is based on polar end characteristics and estimates the single coefficient for all the cross sections i.e to estimate a long run model for each cross section separately and the average slope parameter for each cross section is taken. The numbers of cross section is sensitive to outliers.

The mean group estimator is set in Auto Regressive Distributed Lags (ARDL) to estimate the long run coefficients for each cross section and the average is taken. ARDL has an advantage that it accounts for the order of co-integration i.eI(0), I(1) or fractionally co-integrated and can be estimated while tackling the problem of endogeneity.

3.3 Pooled Mean Group (PMG)

Unlike the mean group model, the PMG model restricts the long run coefficients where the long term coefficients are limited to be identical. It allows the short run coefficients including the intercepts to be heterogeneous and mainly captures the country specific changes. Thus it allows the short run coefficient and error term to change.

The long run slope coefficients are restricted to be homogeneous. It is important to note that the estimates derived from mean group approach would be inefficient if slope homogeneity holds as the same specifications is not for valid for all individual panels. Treatment of heterogeneity is central in PMG model.

Pooled mean group allows the varying intercepts, slope coefficients and standard error across the cross sectional units. However different countries have different dynamics and thus different long run coefficients. PMG takes into account this variation and thus it lies between mean group estimator and fixed effect approach (varying intercept with constant slopes). The large panel data have a non-stationary nature and might contain unit root thus it is important to know the order of integration for if long run relationship exists (existence of co-integration) irrespective of any order I(1) or I(0) in ARDL setting but not in case of I(2) as we know that F-bounds test is based on I(1) and I(0). Secondly, it is important to know that which variable causes changes in other variable (causality). The problem of endogeneity would be tackled with asymptotic T-test if the series is of order I(1) but not in case of I(0). Thus lagged values of the lagged variable are used to estimate the instrumental variables. So, unit root test is very crucial and generally Maddala& Wu test and Pesaran's test of unit roots is followed.

3.4 Co-integration Test

The problem of spurious regression arises if the underlying variables do not co-integrate and this way the results would be unreliable and meaningless. And in the opposite scenario where the underlying variables co-integrate then we have the co-integration. The most authenticated measure, in case of co-integration, is the usage of Auto Regressive Distributed Lag (ARDL) co-integration technique or bound test of co-integration (Pesaran and Shin 1999 and Pesaran et al. 2001). It has been used in many studies where the case of long run relationship between series existed however it is important to note that series needed to be non-stationary. The series also needed to be reparametrized to the Error Correction Model (ECM).

When one co-integrating vector exists, Johansen and Juselius(1990) co-integration procedure cannot be applied. Hence, for the study of long run relationship the ARDL approach to co-integration or bound procedure is preferred without accounting for the level of integration of the underlying variables I(0), I(1) or a combination of both. This approach to co-integration in the realm of ARDL would result in efficient and realistic estimates and helps in identifying the co-integrating vector(s) which is not common in Johansen and Juselius (1990) co-integration procedure. In the ARDL approach the underlying variables are treated as a single entity and form a single long run relationship equation.

The Error Correction Model (ECM) is introduced to reparametrize the vector in case of any co-integrating vector (i.e the underlying equation) is identified. This way the results give both the short-run relationship and the long run relationship of the variables of a single variable. ARDL has the advantage of using a dynamic single model equation and ECM which is possible through re-parameterization.

The model includes the unrestricted lags of the regressors in the regression function and is thus known as the distributed lag. The ARDL approach to co-integration testing would show if any of the underlying variables in the model are co-integrated or not, given the endogenous variable. Important to note here is that the ARDL approach to co-integration does not work in the presence of the multiple co-integrating vectors.

The ARDL approach for co-integration test is based on the Wald-test (F-statistic). Two critical values, the lower bound and the upper bound, are given by Pesaran et al. (2001) for the co-integration test. These two values are based on the idea if there exists any co-integration or not. If there no co-integrating relationship between the variables then the case of lower critical bound i.eI(0) is assumed to be effective. Similarly, thepresence of co-integrating relationship between the variables would lead in the upper bound values thus assuming that all the variables are I(1). Thus, the null hypothesis of no co-integration would be rejected if the computed value of F-statistic is greater than the upper bound critical value which means that the variables in the model are co-integrated. The opposite would be the case in which the value of computed F-statistic is below the lower bound critical value, then the null hypothesis would not be rejected (meaning that there is no co-integration among the variables). When the computed Wald-test F-statistic falls between the lower and upper bound, then the results are inconclusive, meaning that the relationship between the variables cannot be ascertained.

The pre-conditions for ARDL co-integration to be checked are as follow:

- The dependent variables must be non-stationary
- The variables should not be of order I(2) in normal conditions
- The variable should not be of order I(2) in structural break

3.5 Data

3.5.1 Pension expenditure

The data for pension expenditure would be the annual civil service pension expenditures in USD (for the sake of uniformity in calculations) as defined by the laws in respective countries, paid to the pensioners or their legal heirs, under different conditions, and to the retired civil servants, their family or survivors with different levels of entitlement. The statistics here uses the first pillar (state) of the pension tier. The aggregates of pension covered vary between countries, which limits the extent to which it is possible to compare the situation in different countries.

Note that these statistics may not fully reflect the actual cost of pensions provision or the amount actually received by pension beneficiaries (as some pensioners may be liable to taxes and/or social contributions, which has the effect of returning some of the gross amount disbursed back to the government). Looking in more detail, pension benefits related to old-age represented the largest part of overall expenditure on pensions in each of the SAARC Member States. It is important to be aware that pension expenditure per beneficiary does not necessarily reflect the level or adequacy of individual pension provisions. For the sake of standardization the pension expenditure is converted in US dollars. It is the annual pension expenditure which has been spent and is shown in the national accounts of the respective countries.

3.5.2 Population

Population indicates the number of people that usually live in an area and refers to all people(legal nationals) present in, temporarily out of country or residing abroad, and aliens permanently settled in a country. Population changes continuously and has been measured with different approaches and methods. Of the most important approaches is the study of annual change approach which caters for the changes in population due to births, deaths and net migration during the year, it is referred as the population growth.

The population of a country constitutes all groups of the society like: the national armed forces on duty outside the country; civilian aliens currently residing within the country; diplomatic personnel posted outside the country;internally displaced persons residing within the country and merchant seamen at sea. However, the population of a country excludes: the armed forces of other countries currently present or posted in the country; the civilian aliens temporarily in the country or in transit passengers; the diplomatic personnel from other countries currently posted or living in the country.

Population projections are common demographic tools that help to study the patterns of population changes in terms of future projections on the basis of historical trends. The population projection is the basis of statistical projections that help governments in public policy decision makings. This indicator is measured in terms of annual growth rate and in thousands of people. Population is in numbers and has been taken as annual data and the source of data is United Nations' demographic profile and world population ageing reports. United Nations define population as

1) All the inhabitants of a given country or area (province, city, metropolitan area etc.) considered together; the number of inhabitants of a country or area.
2) In sampling, the whole collection of units (persons, households, institutions, events etc.) from which a sample may be drawn.

3.5.3 Rate of unemployment

Unemployment rate refers to theratio of the labour force that is not currently employed but could be an employed person if the job is available. One of the most important factors is defining the unemployment is the fact that the person is willing to work and has attempted to find work. It can bedefined and explained in different ways. Any person who is between the ages 15-59 and has no job or is without work for earning (but is available to/for work and have taken specific steps to find work) would be called an unemployed person. In this context, there is a lack of all acceptabledefinition and the application of a generally accepted definition have resulted in the estimates of unemployment for the comparison between the counties and states rather than estimates based on national definitions of unemployment. The unemployment rate mostly seasonally adjusted and calculated as apercentage of the labour force. The labour force is defined as the total number of unemployed people plus those in employment. Data are based on labour force surveys (LFS).

The LFS is based on the same notion and while counting the rate of unemployment, it is ensured that the individual does not have a job or is working and as a general practice the individual has been attempting to find a job in the past four weeks. This includes the temporary laid off workers as well who could join back the job/work once required. However, the willingness of the individuals matter and if the individuals would stop looking to join back or leaves the job without intimation to the employer then he/she is not counted in the unemployment rate. The unemployment rate is generally used for the comparisons between labour markets and their changing patterns and dynamics, internationally. Unemployment can be in long-term and short-term and if the unemployment rate remains stagnant for a longer period of time then it would be having serious ramifications for economy and people at large. The short-term unemployment is not as severe issue as compared to the long-term unemployment because the long-term unemployment results in the job skills of the jobless individual thus making them less competitive while losing motivation to find and attempt for a new job thus they remain dissatisfied and depressed over the period of time.

Other ramification of the long-term unemployment relates to the taxpayers' burden and stress on the social service systems as the public goods would be financed by the taxpayers while the social service systems would be utilised with lesser funding in case of long-term unemployment. The individuals consider the low unemployment rate good for themselves and the wider community in general. Employed individuals have greater satisfaction level as they can spend more compared to the unemployed individuals. Remaining employee for a longer period gives the individual an advantage to negotiate for increase in wages and thus they feel more secure in their jobs. Lower unemployment ratehas positive effect on the economy as the economic activity increases activity resulting in increased tax revenues for more social program spendings. The rate of unemployment is the annual rate and has been taken from World Bank.

3.5.4 Old age dependency ratio:

Old age dependency ratio (ODR) refers to the ratio of older persons (60 years or above) to the working-age (15-59 years) individuals. ODR is defined as the number of individuals aged 60 and over per 100 people of working age (aged between 15 and 60). There are many factors affecting the change in ODR like fertility rate, mortality rate and migration.This ratio helps to quantify the amount of fiscal burden to be paid by the working-age population for the benefits of the retired population thus the burden increases with the increase in the dependency ratio.

The population aged up to 15 years andyounger and people aged 60 and older as referred to be non-working population which means that these population clusters don’t work and are financially dependent on the working population or people who work.This notion has some defects in practical life as strictly speaking this does not happen in full effect because all people aged above 60 years do not stop working and many people aged 15–59 do notnecessarily in terms of employment. Another defect of the ODR is its failure to account for increasing longevity. Older population strata aged above 80 years are prone more health issues than the younger aged retirees. Also, ODR fails to account for behavioural change because this is static ratio.

Unlike the theoretical background and theoretical assumptions that older population become prone to different health issues is not very valid today as the general public health is getting better and we see increasing number of women and old age people joining the labour force. That is why the retirement age is changing in many counties as part of pension reforms. All of this has brought more people into the labour market than ever before, and they are also staying in the labour market longer than ever before.

3.5.5 Life expectancy

The paper takes into account the life expectancy at the age 60 years. The data has been taken from the respective countries’ demographic reports. Demographers and many researchers advocate the use of life expectancy as a measure of population ageing. They believe that age refers in terms of years left until death or in proportion to expanding lifespan rather than a fixed chronological age boundary.

In other words the term is a measure of expectation above one’s life after the age of 60 years. For the purpose of demographic studies the life expectancy means the how many more yearspecific strata of population live after 60 years on average. An alternative approach consists in estimating the average length of life for a hypothetical cohort assumed to be exposed, from birth through death, to the mortality rates observed at one particular period – commonly a year. It is important to note that the life expectancy does not take into account the changing mortality rates over the period of time and assumes the static rate once announced and the rate is for all the population.

As a matter of fact, life expectancy depends on various factors and it may vary from case to case. For example, the lifestyle, access to healthcare, diet, economical status and the relevant mortality and morbidity data decide the life expectancy at individual level and thus would effect at society level. This needs to be taken into account.But, as mentioned above, the measure of life expectancy is based onaverages and it does not necessarily mean that the individual would be living more or less than the period expected. Practically speaking, the measurement and estimation of life expectancy depends on the prediction and the probability of surviving successive years of life, based on observed age-specific mortality rates. The prolonged increase in life expectancy implies the increase in number of older population and in the number of retired individuals too.

3.5.6 Control variables

It is possible that the pension expenditure in case of publicly managed unfunded defined benefit pension based on pay-as-you-go directly financed from the national budget might not face the fiscal pressure if the GDP growth is stable with greater revenue to GDP ratio or more increasing number of civil servants is joining the services. Also the inflation has been chosen as control variable as it plays an important determinant of pension expenditure, consumption smoothing and income security. Of the most important reason for choosing inflation as a control variable is the fact that India indexes its pension benefits with inflation and India plays a significant role in our sample.

CHAPTER 4

ESTIMATION AND RESULTS

4.1 Empirical Results

The long run slope coefficients for the whole region, as a common slope, is presented in Table 4-1 while the short run country level as individual slopes coefficient is given at Table 4-2.

It is evident from the table that population has positive impact on the pension expenditure. As shown in the table, 1 percent increase in the population results in 0.85 percent increase in pension expenditure in our selected Asian economies. The result is statistically significant in the regression. It can be learned from the regression that there is strong positive relationship between the population and pension expenditure.

The result makes a sense as the SAARC countries have a increasing demographic projection with the population increasing since the 1970s. Both the increase in population and increase in the pension expenditure go in line in the projection. Also, very important to discuss here is the cultural setup of the SAARC region. Almost all the SAARC member countries have a joint family system with very high rate of co-residence. The increase in population means the increase in dependents. Due to the design and the nature of the pension system for the civil servants the dependents get a lifetime pension benefits thus the pension expenditure does not end with the demise of the pension himself or herself.

There is positive relationship between the pension expenditure and the unemployment in the regions under study. As evident from the table the unemployment coefficient 0.0775 implies that 1 percent increase in unemployment results in 0.08 percent increase in pension expenditure for the countries under study. It is interesting finding as the unemployment has no direct relationship with the civil service pension systems. But the case of SAARC countries is different as almost all the member countries have the same defined benefit pension system for the civil servants based on PAYG system. This means that the pension expenditure is financed through pay roll taxes. The lesser entry into civil service result in lesser pay roll taxes while increasing number of pensioners adding to the pensioner population. Also, the unemployment might have an indirect effect on the determinants of the pension expenditure that may lead to the increasing pension expenditure as well. It needs to be studied as is far beyond the scope of this paper. In long run, the relationship between the unemployment and the pension expenditure is statistically significant and positive.

The old age dependency ratio and pension expenditure show the same result as above. There is statistically significant and positive relationship between the two variables in the long run. As can be seen from the table, 1 percent increase in old age dependency ratio results in the 2.2 percent increases in the pension expenditure of the SAARC countries. There have been many studies on the relationship between the old age dependency ratio and the pension expenditure and the result is very much in line with the findings of other studies. The greater coefficient might be due to two reasons; the first is the low number of civil entrants into the civil service and lower payroll taxes especially in case of Bangladesh and due to pension reforms for the new civil service entrants in India and Sri Lanka after 2004. This means that the defined benefit pension system based on the PAYG system would need more and more civil servants to contribute the pension benefits of the current retirees through payroll taxes.

Life expectancy has been used as a measure of ageing in many studies to measure the ageing population. In our case has a positive and significant relationship with the pension expenditure. In our study, it is the second most important variable after old age dependency ratio. Almost all the previous studies both on the regional and the country level find that there is a positive relationship between the life expectancy and the pension expenditure with defined benefit PAYG pension system in in vogue. According to the results the 1 percent increase in the life expectancy would result in almost 2 percent increase in the pension expenditure in SAARC member countries. As evident from the table the result is statistically significant.

Similarly the case of Gross Domestic Product is same as above findings. It is positively related to the pension expenditure. As per the result shown below the 1 percent increase in the GDP would result in almost 0.8 percent increase in the pension expenditure. It is statistically significant so we cannot ignore its importance. The best justification for the result would be the inherent design and feature of the defined benefit PAYG pension system generally of civil service. As in most cases the pension expenditure is financed through the general budget for the civil servants the pension expenditure would not increase both in terms of revenue and the GDP growth. In other words, the GDP growth like that of Bangladesh and India would not strain the national budget thus the need for reforms would not be felt enormous.

Last but not the least is the inflation. It has a positive relationship with the pension expenditure. It is statistically significant and superficially may be due to India as it indexes the pension expenditure with the inflation. It is evident from the results that 1 percent increase in the inflation would result in 0.02 percent increase in the pension expenditure.

As we can see that the sign and significance of the ecm term is correct. But the magnitude seems to be higher unlike expected. It shows the speed of adjustment that how much the previous year's deviation is adjusted in the current year. As per the result show below 60% of the disequilibria in pension expenditure of the previous year shock adjust back to the long-run equilibrium in the current year.

The mean group estimates are insignificant and hence is not discussed in detail. It is mainly because of the result having no significance in long run. That is why Hausman test is used for this purpose. It helps to choose between pooled mean group and mean group estimates. As shown in the table, the p-value suggests that pooled mean group estimates would be better than the mean group estimates.

The short run results are interesting as shown in Table 4-2. We are interested to estimate the heterogeneity of the slope coefficients and it has been one of the main objectives of this study. In this regards, the Pooled Mean Group estimators would best fit the estimation technique as it can provide the heterogeneous estimates for the short run in the case of the pane data like this one. The heterogeneous slopes estimates for 8 SAARC countries are given below.

It is very interesting to know that the increasing population has an increasing effect on the pension expenditure. The same trend and relationship could be found in case of unemployment and its relationship with the pension expenditure. It becomes more interesting when we study the relationship between pension expenditure and the old age dependency ratio and life expectancy. There is a negative relationship between the pension expenditure and old age dependency ration and life expectancy in case of Bhutan which may due to its defined contribution system. Also Nepal shows a negative relationship between the pension expenditure and the old age dependency ratio. Both Pakistan and Sri Lanka show a negative relationship between the pension expenditure and the life expectancy. There is negative relationship between the pension expenditure and unemployment in case of Bangladesh and Pakistan while rest of the countries show a positive relationship. Inflation is not a significant variable in terms of pension expenditure other than in case of India.

Table 4-1: Impact of Population Ageing and Unemployment on Pension Expenditure

Dependent variable is natural log Pension Expenditure			
regressors	**PMG**	**MG**	**Housman Test**

Population	0.8534	1.1739	**Chi-Stat**	**p-value**
	(0.2431)*	(0.5267)*	0.91	0.9889
Unemployment	0.0775	0.0595		
	(0.0206)*	(0.0348)*		
Old age dependency Ratio	2.2136	3.7527		
	(0.7145)*	(1.2869)*		
Life Expectancy	1.9096	1.0396		
	(0.3663)*	(0.5338)*		
GDP	0.8265	1.9207		
	(0.1852)*	(2.1663)*		
Inflation	0.0215	0.0055		
	(0.0041)*	(0.017)*		
Ecm	-0.5801	-1.0433		
	(-0.144)*	(-0.126)*		

* Standard errors

Table 4-2: Short run Heterogeneous Estimates of Selected Asian Countries

	Population	*Unemployment*	*Old age dependency Ratio*	*Life Expectancy*	*GDP*	*Inflation*	*Ecm*
India	1.1827	0.0129	1.7073	0.1332	2.1584	0.0366	-0.1692
Pakistan	1.7394	0.0291	1.4444	-3.0994	-1.8717	0.0168	-1.582
Bangladesh	0.9022	0.0467	12.9546	14.1637	-0.5506	0.022	-0.4125
Sri Lanka	0.7376	0.0293	2.1171	-2.9475	0.0825	0.0047	-0.2964
Nepal	0.7146	0.0104	-0.6619	0.258	0.859	-0.0015	-0.2857
Bhutan	0.2699	0.0589	-3.2402	-4.5486	2.217	-0.0058	-0.3223
Afghanistan	0.0242	0.0265	2.6084	-1.7342	0.1322	0.008	-0.68

CHAPTER 5

CONCLUSION

The paper assessed the civil service pension system of the SAARC countries. The study finds that the population ageing factor like old age dependency ratio and life expectancy have a significant positive relationship with the pension expenditure at the regional level in the long run. The country specific determinants of the pension expenditures vary from country to country specially in the short run. The details of country wise findings could be concluded in following paragraphs.

Sri Lanka is fastest ageing country while the Afghanistan has the lowest ageing rate in south Asia. All countries, except Bhutan, have a growing rate of population ageing at different rates. Civil servants constitute a tiny proportion of older population almost in all countries. Every south Asian country has its own civil service pension and most of these are defined benefit system. The pension reforms in some countries have introduced a changing trend in pension expenditures. Afghanistan has a stable population growth and the recent reforms measures and overall GDP growth provide a cushion to the rising pension expenditure. The effective implementation of these reforms measures would decide the fiscal sustainability of the pension system. Afghanistan has the lowest civil servant to population ratio in South Asia and currently the pension expenditure is not stressful.

Bangladesh shows a significant projection both in terms of population increase and the population ageing. The civil service pension system is publicly managed non-contributory defined benefit system and financed directly from national budget. The number of civil servants increases exponentially and almost doubled between 1971 and 1986 as it became a new country in 1971 and had to start from the scratch. There are no significant risks associated with the current pension system with current demography.

Bhutan has a unique dynamic in the region both in terms of pension system and demography. Its contributory pension design is functioning well while old age dependency ratio is growing fast, bringing potential pressure on the pension system. The most important thing to note about the Bhutanese pension system is the availability of pension fund reserves to meet the pension liabilities. Parametric reforms suits best the Bhutanese reform agenda until it develops the required conditions.

India's population is growing fast with stable population ageing projections. Life expectancy and old age dependency ratio remains same at almost the constant rates. It has two parallel pension systems for civil servants, one for those who joined the service before 2004 and one for new entrants in civil service after 2004. Pension expenditure has dramatically increased since 1981. Ratio of pension expenditure to tax revenue has already surpassed average of developing countries almost 12 percent. PFRDA has also an ambitious target to include the Indian diaspora working abroad in the NPS. The government is trying to make deal with different countries on the matter. According to studies the private pension would accumulate USD 300 billion by 2019-2020. India demographic projection is favourable in terms of the sustainability of the pension system. The most notable characteristics of the Indian NPS are that it transfers the demographic risks towards the workers. Also, NPS resulted in bringing down the replacement rate.

Nepal's population is also stable while population is ageing significantly with stable life expectancy rate but high old age dependency ratio. Like other pension civil services pension systems in South Asia it is also generous in term of pension benefits mainly due to the wage compression in civil service. Nepal has more poverty among the older age population and thus the importance of pension reform stands more important.

Pakistan's population is increasing fast with population ageing fast. The life expectancy in Pakistan is not increasing significantly but old age dependency ratio is projected to almost double till 2050. The government is thinking of pension reforms due to the projected pension expenditure and the unsustainability of pension system.

Similarly, Maldives' population is stable in its growth but it is ageing with a significant rate. The life expectancy rate is increasing significantly with fast increasing old age dependency ratio. It is the smallest country in the South Asia with highest gross national income in the region. According to the demographic profile the population ageing is taking effect rapidly in Maldives. The pension to GDP ratio is high and the economic performance has a significant effect on the pension expenditure. There is a defined contribution scheme well in place which covers the majority of civil servants.

The study concludes that demographic changes like increasing old-age dependency ratio and life expectancy has positive impact on the pension expenditure. Similarly increase in population and unemployment also balloons the pension expenditure due to the social structure and living style in South Asia. It has also been observed that the GDP growth has also a positive effect on the pension expenditure which may be due to the generous grant to the old age population by the government due to better economic performance. Also important to note is the positive effect of the inflation on the pension expenditure and is mainly due to the indexation of CPI with the pension increments in India.

It is high time for the SAARC member countries to bring necessary reforms in the pension system not only to improve it sustainability but also it adequacy, coverage and portability. As the poverty alleviation is a top priority of every member country's government so the pension needs to be studied as whole public policy theory. Future studies could be carried focusing on the pension in the informal sectors to address the issue of old age income with poverty under one umbrella.

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APPENDIX

Correlation Matrix: Afghanistan

	Population	LE	GDP	UMP	ODR	Inflation	PE
Population	1	0.4	0.2	0.1	0.7	0.4	0.3
Life Expectancy	0.4	1	0.4	0.4	0.9	0.2	0.6
GDP	0.2	0.4	1	0.6	0.6	0.7	0.2
Unemployment	0.3	0.4	0.6	1	0.7	0.5	0.3
Old-age Dependency Ratio	0.8	0.9	0.6	0.7	1	0.5	0.7
Inflation	0.4	0.2	0.7	0.5	0.5	1	0.3
Pension Expenditure	0.3	0.6	0.2	0.3	0.7	0.3	1

Correlation Matrix: Bhutan

	Population	LE	GDP	UMP	ODR	Inflation	PE
Population	1	0.3	0.5	0.2	0.8	0.3	0.1
Life Expectancy	0.4	1	0.5	0.4	0.7	0.2	0.1
GDP	0.4	0.5	1	0.7	0.5	0.7	0.2
Unemployment	0.3	0.6	0.7	1	0.7	0.7	0.3
Old-age Dependency Ratio	0.8	0.7	0.5	0.5	1	0.2	0.1
Inflation	0.3	0.2	0.7	0.7	0.2	1	0.3
Pension Expenditure	0.1	0.1	0.2	0.3	0.1	0.3	1

Correlation Matrix: Bangladesh

	Population	LE	GDP	UMP	ODR	Inflation	PE
Population	1	0.5	0.4	0.2	0.5	0.2	0.3
LE	0.5	1	0.4	0.4	0.7	0.2	0.5
GDP	0.4	0.4	1	0.6	0.6	0.7	0.2
Unemployment	0.2	0.4	0.6	1	0.7	0.6	0.4
Old-age Dependency Ratio	0.5	0.7	0.6	0.7	1	0.5	0.5
Inflation	0.2	0.2	0.7	0.6	2.2	1	0.3
Pension Expenditure	0.3	0.5	0.2	0.4	0.5	0.3	1

Correlation Matrix: India

	Population	LE	GDP	UMP	ODR	Inflation	PE
Population	1	0.4	0.4	0.2	0.4	0.2	0.2
LE	0.4	1	0.3	0.2	0.8	0.1	0.4
GDP	0.4	0.3	1	0.3	0.4	0.1	0.2
Unemployment	0.2	0.2	0.3	1	0.2	0.3	0.1
Old-age Dependency Ratio	0.4	0.8	0.4	0.2	1	0.1	0.5
Inflation	0.2	0.1	0.1	0.1	0.1	1	0.6
Pension Expenditure	0.2	0.4	0.2	0.1	0.5	0.6	1

Correlation Matrix: Maldives

	Population	LE	GDP	UMP	ODR	Inflation	PE
Population	1	0.5	0.4	0.3	0.5	0.2	0.4
LE	0.5	1	0.4	0.3	0.9	0.1	0.5
GDP	0.4	0.4	1	0.3	0.4	0.2	0.2
Unemployment	0.3	0.3	0.3	1	0.3	0.4	0.3
Old-age Dependency Ratio	0.5	0.9	0.4	0.3	1	0.1	0.5
Inflation	0.2	0.1	0.2	0.4	0.1	1	0.3
Pension Expenditure	0.4	0.5	0.2	0.3	0.5	0.3	1

Correlation Matrix: Pakistan

	Population	LE	GDP	UMP	ODR	Inflation	PE
Population	1	0.4	0.2	0.3	0.4	0.3	0.1
LE	0.4	1	0.4	0.4	0.7	0.2	0.6
GDP	0.2	0.4	1	0.5	0.4	0.7	0.3
Unemployment	0.3	0.4	0.5	1	0.4	0.5	0.4
Old-age Dependency Ratio	0.4	0.7	0.4	0.4	1	0.2	0.6
Inflation	0.3	0.2	0.5	0.4	0.2	1	0.3
Pension Expenditure	0.1	0.6	0.3	0.4	0.6	0.3	1

Correlation Matrix: Sri Lanka

	Population	LE	GDP	UMP	ODR	Inflation	PE
Population	1	0.2	0.2	0.2	0.3	0.4	0.1
LE	0.2	1	0.3	0.1	0.8	0.4	0.7
GDP	0.2	0.4	1	0.5	0.4	0.3	0.3
Unemployment	0.2	0.3	0.2	1	0.4	0.5	0.5
Old-age Dependency Ratio	0.3	0.8	0.4	0.4	1	0.2	0.7
Inflation	0.4	0.4	0.3	0.5	0.2	1	0.2
Pension Expenditure	0.3	0.7	0.3	0.5	0.7	0.2	1

Panel Unit Root Tests : p-vlaues are given with Null hypothesis that Series is I(1)															
	India				**Pakistan**				**Bangladesh**				**Sri Lanka**		
Pesaran Panel Unit Root test															
	Lag 0	Lag 1	Lag 2		Lag 0	Lag 1	Lag 2		Lag 0	Lag 1	Lag 2		Lag 0	Lag 1	Lag 2
Population	0.655	0.006	0.003		0.541	0.009	0.001		0.390	0.001	0.006		0.415	0.002	0.007
Unemployment	0.282	0.001	0.009		0.430	0.003	0.001		0.682	0.007	0.004		0.493	0.001	0.000
Old Age Ratio	0.397	0.008	0.003		0.327	0.006	0.003		0.632	0.003	0.007		0.373	0.010	0.002
Life Expectancy	0.331	0.007	0.003		0.467	0.008	0.005		0.563	0.000	0.007		0.380	0.007	0.001
GDP	0.470	0.008	0.009		0.399	0.009	0.009		0.492	0.001	0.004		0.239	0.008	0.005
Inflation	0.228	0.001	0.003		0.288	0.006	0.001		0.422	0.004	0.002		0.158	0.009	0.005

Panel Unit Root Tests : p-vlaues are given with Null hypothesis that Series is I(1)											
	Nepal				**Bhutan**				**Afghanistan**		
Pesaran Panel Unit Root test											
	Lag 0	Lag 1	Lag 2		Lag 0	Lag 1	Lag 2		Lag 0	Lag 1	Lag 2
Population	0.468	0.009	0.000		0.207	0.008	0.001		0.340	0.003	0.002
Unemployment	0.584	0.002	0.007		0.662	0.006	0.007		0.478	0.004	0.006
Old Age Ratio	0.518	0.004	0.006		0.522	0.001	0.003		0.386	0.002	0.003
Life Expectancy	0.514	0.002	0.002		0.366	0.003	0.005		0.385	0.009	0.004
GDP	0.533	0.009	0.004		0.259	0.005	0.008		0.507	0.002	0.002
Inflation	0.173	0.006	0.000		0.325	0.007	0.003		0.174	0.002	0.007