Pension System Reform: Factors That Have Driven and Necessitated the Pension Dynamics Globally

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ABSTRACT

Technological and medical advancement globally in recent times has led to an increase in the life expectancy and research shows that there will be a further increase in the coming years. And increase in the life expectancy ratio poses a threat to the pension systems of an economy. The world has experience a global pension system crisis due to the increasing aging populations hence a high old dependency ratio. The global pension systems was generated by factors such as increase in older population, inadequate savings for retirement in old age and increase in unfunded pension liabilities. There have been moves by the various governments to adopt measures to mitigate the rise in the pension costs within their countries. This paper discusses in details the factors that have driven and necessitated the pension system reform dynamics at the global stage.

Keywords: elderly poverty, pension system reform, old age crisis

INTRODUCTION

The Life expectancy rates have rapidly increased in all OECD countries since the 1970s (Fall and Bloch, 2014). One of the major causes for this is the advancement in technology and medicine leading to rising life expectancy that is expected to increase further in the coming years. The average life expectancy at birth in OECD countries between 2010 and 2015 was an average of 77.2 years for the men and 82.7 years for the women (OECD, 2013).

With the longevity being a global phenomenon, the world is rapidly ageing while there is a notable reduction in the population growth rate due to declining fertility numbers and higher life expectancies (Thøgersen, 2015; Bloom et al., 2015). In regards to old age, the UN distinguishes among an aging, aged and super aged society. The old dependency ratio, which is used as an indicator of aging refers to the ratio of the population aged over 65 years old to the population aged 15-64. The UN defines an aging society as one with more than 7% elderly aged 65 or over. A society with a population with 14% or more aged 65 or older is considered aged according to the UN. Finally, a society is deemed as super aged when 20% of its population is comprised of the elderly.

According to a report released by Moody entitled "*Population Aging Will Dampen Economic Growth over the Next Two Decades*" (Moody's Investors Service, 2014), over 60% of Moody's-rated countries are officially 'ageing' in 2015. By 2020, the number of 'super-aged' societies will rise to 13 globally from five today (Italy, Germany, Greece, Finland and Japan) and until 2030, 34 countries will be super-aged. Currently the percentage of people over 60 years old is 12.3% of the global population. It is estimated that this number will rise to 22% by 2050 (UN; Bloom et al., 2015), a jump from 800 million to 2 billion people. Out of this percentage, the share of individuals aged 65 and older (which is an age used as a standard to determine an old age society according to the UN) will increase from 8% in 2015 to 18% by 2050 and from 16% to 27% in the OECD (OECD, 2015). Importantly, elderly people around the globe experience high levels of poverty and deprivation (Barrientos, Gorman, and Heslop, 2003; Jeyalakshmi, Chakrabarti, and Gupta, 2011; Lloyd-Sherlock, 2002), therefore making it even more imperative to deal with the social and economic challenges that an ageing world poses. One way to deal with the challenges stemming from an ageing population is to develop sustainable pension systems. Towards this end, governments in the 21st century try to implement social security systems (Asher and Bali, 2010). Succeeding to deliver social welfare can have implications for the economy since it influences economic performance and capital accumulation through affecting taxes and intergenerational transfers (Imam, 2011).

The need to reform old-age security systems has arisen in the agenda of many countries around the world in particular following the mid-1990s with considerable debate on the usefulness of such initiatives (Mudrazija, 2006). The blueprint for most of these reforms apart from several OECD countries has been Averting the Old Age Crisis (World Bank, 1994). The most important elements of pension reform have been developed by the World Bank ever since (Mudrazija, 2006) and have informed the policy making of many countries. However, several other research studies have been conducted in relation to pension reform. In leading a pension reform, it has been acknowledged that there is not a single type of program that will apply for all countries (Scharpf, 2000). Therefore, there is no such thing as a "one-size-fits-all" policy (Mudrazija, 2006).

LITERATURE REVIEW

PENSION SYSTEM REFORM DYNAMICS AT THE GLOBAL STAGE:

Citi Bank, (2016) carried presented a detailed report that was dubbed; "The coming pensions crisis-

recommendations for keeping the global pensions system afloat". The report by Citi Bank looked at the dynamics of the global pension system crisis clearly identifying the genesis of the pension system crisis and the way forward. The report identified various critical factors that had led to the pension crisis that has hit the global economy over the last few years forcing countries to push for more wide-reaching pension reforms. Citi Bank, (2016) noted that the pension systems crisis had primarily resulted from the increase in the longevity globally whereby the advancement of the technology has enabled people to live longer and this means the older population are much more expensive to take care of. The increase in the longevity is coupled with people saving inadequate funds for old age after retirement and this goes further to exacerbate the pension crisis globally.

The report by Citi Bank, (2016) noted that the increasing number of the older population and the lack of adequate savings for the retirement in old age meant that the pension crisis was imminent. The report noted that both public and private pensions globally were facing increasing pressure and challenges from the increasing number of the retiring population. These funds have to meet the twin problems of ensuring that they have adequate funds to meet the pension benefit payments and to address the problem of low pension coverage. The median age globally is expected to drop and this is due to two main factors; the decreasing fertility levels globally have led to the shift in the population dynamics with the population getting older. The increase in the life expectancy has also resulted in the increase in the number of the older people in the population.

Citi Bank, (2016) also noted that the increase in the unfunded pension liabilities as another factor that is driving the pension crisis globally. The pension benefit obligations are not fully backed by the saved funds. The report as an illustration noted that local and federal defined pension schemes had between 1 to 3 Trillion Dollars of unfunded pension liabilities.

Capretta & Jackson, (2007) on a research that looked at the global pension system dynamics noted that the pension reforms some selected 12 OECD countries were characterized by increases in the retirement age so as to delay the effect of the ageing population for a few more years. Some of the 12 countries also sought to pre-empt the effect of the ageing population by running of budget surpluses and having pension trust funds to be used to bridge the pension benefits payments gaps in future when the ageing effect hit.

Holzmann, (2012) noted that the nature of the pension reforms that were being adopted by the various countries shift a lot due to the changing reform needs in those countries, shift in the objectives both pension related and economic related. The environment that facilitates the implementation of the pension reforms also has an impact on the nature of the adopted pension system reforms. Holzmann, (2012) noted that the global financial crisis that hit the global economy from 2007-2012 had a huge bearing on the nature of pension systems adopted globally. The research argued that the global financial crisis had a profound impact on the nature and the direction of pension reforms adopted by various countries. The research observed that the implication for both the funded and the non-funded pension schemes as the main driver of the pension reforms in this period.

OECD (2013) identified various reform strategies were identified as being adopted by OECD countries in relation to the pension reforms; the first strategy that was adopted by most countries entailed increasing the pension entitlement age. Under the pension age increases Australia had increased its pension entitlement age from 60 to 65 and then further to 65 years of age (OECD, 2013). Austria, France and Greece raised their pension entitlement ages to 62, 62 and 65 respectively. The countries had rewritten the pension entitlement calculation formulas to ensure that pension payments are made over a wider time frame. There was also introduction of minimum pension contributions that are pegged on the life expectancy and to the individual's incomes.

DISCUSSIONS

At the global stage, over the last few years, certain factors drove and necessitated the pension system shape and dynamics and pension reforms. These factors are discussed below

Demographic Transition with increasingly ageing populations:

There has been a demographic shift over the last few years that have deemed the classical demography transition models infeasible. The classical demographic transition model was characterized by the population where any society would start with high levels of fertility and mortality. The high fertility and mortality rates would then transition and reduce gradually to lower levels that had a high degree of stability (He, Goodkind, & Kowal, 2016). The population growth rate and the structure of the population age composition of any country is impacted by the demographic transition path.

There exist four stages within the demographic transition of any population. On the first stage in the demographic transition there is a high rate of birth and death and the gap between the birth and the death rate is low. This means that the population increases very slowly at the first stage of the demographic transition. At this first stage the population the population is made up of a large number of young and few old people and the population structure takes the form of a pyramid with a wide base. On the second stage of the demographic transition the child and infant mortality decreases rapidly while the fertility remains high.

The proportion of the young in the population increases further but the older population starts to increase. At the third stage of the demographic transition the older population mortality decreases and the life expectancy increases further. At this stage the fertility decline and the increased life expectancy shifts the structure of the population and the population becomes older. At the fourth stage the mortality rate and the fertility rate are low and stable and the population is now constituted by a majority of old generation.

Some of the factors that drive the four stages that make up the demographic transition include; improvement of the public health within the country, improved basic sanitation and medicine advancements. The timing of the four stages vary from one country to another and the developed countries have been further ahead in the demographic transition curve with less developed countries lagging behind. As the country develops the is some acceleration in the demographic transition.





From figure 1.1 above we can see that the distribution of the population aged over 65 years per region for 2015 and projections for 2050. Asia with 55.3% had the highest percentage of those aged 65 years and above and this means that 55.3% of the population of the countries in Asia on average is made up of those aged above 65 years. Europe at 21% was the region with the second highest percentage of those aged above 65 years. North America at 9.5% had the highest percentage of those aged above 65 years of age. Latin America and Caribbean with 7.6% had the fourth highest percentage of population being over 65 years of age. Finally, Africa at 6.6% was the region with the least percentage of population aged above 65 years of age.

By the year 2050 the Asian region at 62.3% will still be the region with the highest proportion of those aged 65 years and above. Europe at 12.6% is projected to have the second largest percentage of those aged 65 years and above but this percentage will be almost half the percentage the region had in 2015. The African region at 9.6% is projected to have the third largest percentage of those aged between 65 years and above in 2050. The Latin America& Caribbean at 8.9% is projected to have the fourth largest proportion of the population made up of those above 65 years and North America at 6.6% will have the lowest proportion of those aged 65 years and above.

Vaar	Total population			Population aged 65 and over			Percentage aged 65 and over			
Year	Both sexes	N	Male Fernal	Both sexes	Male	Fernale	Both sexes	Male	Female	
2015 2030	7,253.3 8,315.8	3,68 4,17	52.0 3,601. 76.7 4,139.		274.9 445.2	342.2 553.4	8.5 12.0		9.5 13.4	
2050	9,376.4	4,68	81.7 4,694.	7 1,565.8	698.5	867.3	16.7	14.9	18.5	
Region			Pop	Population (in millions)			Percentage of regional total population			
			2015	203	2 2	050	2015	2030	2050	
Africa			40.6	70.3	3 1	50.5	3.5	4.4	6.7	
Asia			587.3		75.3	7.9	12.1	18.8		
Europe 129.6			169.1	1 19	96.8	17.4	22.8	27.8		
Latin America and the Caribbean 47.0			82.5	5 10	39.2	7.6	11.8	18.6		
Northern America			82.4	4 9	94.6	15.1	20.7	21.4		
Oceania			4.6	7.0		9.5	12.5	16.2	19.5	

Table 1. 1 World Total Population and Population Aged 65 and Over by Sex: 2015, 2030, and 2050)
(Numbers In millions)	

Source: (He, Goodkind, & Kowal, 2016).

From table 1.1 above we can see that 8.5% of the world's population is above 65 years and this population is approximately 617 Million according to projections made by the United States Census Bureau (He, Goodkind, & Kowal, 2016). The population of those aged 65 years and above is projected to increase by 27 million each year up to the projected figure of 1.6 Billion in the year 2050. The older population above 65 years is projected to make up 16.7% of the total world population in the year 2050.

The ageing of the world populations can be attributed to increased life expectancy with the life expectancy at birth expected to increase from 68.6 years as at 2015 to 76.2 years by the year 2050. The changing in the

population dynamics has led to aging of the populations globally which has been the main driving forces of the pension system reforms globally over the last 30 years (Allianz SE, 2016). The aging of the populations globally has led to the increase in the dependency ratios globally.



Figure 1. 2 The Old age dependency ratios for different world regions. *Source: (Allianz SE, 2016)*



Figure 1. 3 Dependency Ratio -Population aged 65 and older to population aged 15 to 64 {2015 & 2050 Projections}. *Source: (Allianz SE, 2016)*

From figure 1.2 and 1.3 above we can see that the dependency ratios are high and projected to increase towards the year 2050. The dependency ratio is highest within the Western European region with the ratio approaching 30% as at 2015. The dependency ratio is approximately 10% in South East Asia and South America. The dependency rate is currently lowest in Sub-Saharan Africa at 6% (Allianz SE, 2016). The aging populations means that countries will incur more to take care of the older population and pension expenditures is bound to increase.

Global Financial crisis 2007-2009:

The global financial crisis that hit the global economy between 2007 and 2009 had a telling impact on various sectors of the global economy and the pension sector was not an exception. The Global Financial Crisis had a telling impact on pension and incomes received by the older populations. Most countries experienced economic decline and recession between the Global Financial Crisis period between 2007 and 2009 (He, Goodkind, & Kowal, 2016). Most major economies including the United States and majority of countries in Europe experienced economic slowdown and recession. Only few countries like China and India did not enter into recession but merely experienced slowdown in their economic growth rates (Bernanke, 2009).

The Global Financial Crisis led to rising levels of unemployment across most countries globally. There was also rapid fall in the housing prices and other related investments. Looking at a research carried out in four countries that included South Korea, Portugal, United States and United Kingdom as indicated in figure 1.4 below we can see the impact of the Global Financial crisis on those aged above 65 years. The unemployment rates for those aged above 65 years in the United States rose by over 100% between 2006 and 2010 with unemployment risisng from 2.9% in 2006 to 6.7% in 2010. The unemployment among those aged above 65 years also rose in South Korea and Portugal but to lower levels compared to the United States.



Figure 1. 4 Unemployment Rates (Ages 25-54 & Above 65) For United States, United Kingdom, Portugal and South Korea between 2000 and 2013.

Source: (He, Goodkind, & Kowal, 2016).

The retirement benefits, retirement plans and the wealth of the older population was directly impacted by the Global Financial Crisis especially through the negative impact on the housing prices and other financial investments. In one study in the United States, the real wealth of those aged between 53 and 58 declined by 23% between 2006 and 2010 (Gustman, Steinmeier, & Nahid, 2012). The Global Financial Crisis had an impact on the pension systems globally especially impacting on the pension benefits that were pain to the retiring population. The pension benefits reduction was two pronged; First, the governments adopted policies reducing the pension paid due to the fiscal pressures brought about by the Global Financial Crisis. Secondly, the investment returns of the pension funds declined and this in turn reduced the pension fund balances and the pension funds had to pay lower returns.

The Global Financial Crisis also promoted the older workers to postpone their retirement and to continue working even after they hit the retirement age. The labour force participation rates for those aged above 60 years accelerated during the Global Financial Crisis period. In a study conducted in 20 OECD countries the labour participation rate accelerated in more than half of the 20 countries considered in the research (Burtless & Barry, 2013). The labour participation rate for those above 60 years only declined in three countries that is Portugal, Greece and Ireland. The negative impact by the Global Financial Crisis on the pension systems emphasized the need for reforms within the pension systems globally. Many pension systems had been financially unsustainable even before the global financial crisis and the crisis negative impact brought an urgency towards adoption of pension reforms. The Global Financial Crisis brought more focus on the people that needed to be covered by the pension and the affordability of the pension systems that were adopted (Capretta, 2007).

Low Pension Coverage and Low pension benefits.

Ensuring that there is adequate coverage of the pension within any country is essential in combating poverty levels among the old. If there is low coverage of the pension schemes in a country the poverty levels among the old will be at high levels due to the fact that a large proportion of the old population will lack adequate incomes to sustain them. Most of the OECD countries have set up mandatory public and private pension schemes so as to increase the level of pension coverage. It is important to note that other countries with large informal sectors even with these mandatory pension schemes continue to have low pension coverage. (OECD, 2016).

Various countries have adopted pension reforms that have enabled enhancement of pension reforms to segments of population that had been previously ignored by the by pension coverage. The pension benefits coverage has been enhanced by both adoption of new pension schemes to coverer these neglected groups and introduction of additional pension benefits. The additional pension benefits have been framed in such a way that they target these uncovered sections. Another strategy that has been adopted to increase pension benefit coverage is the reduction of the pension benefit-qualifying period a good example being Japan that reduced the pension-qualifying period from 25 to 10 years. This reduction of the pension benefit qualifying age has promoted increased pension coverage by encouraging those that work for a shorter period to take up subscription to various pension schemes. Other measures adopted include extension of the employee pension schemes to cover the part time staff (OECD, 2016).



Figure 1. 5 Proportion of Labour Force Covered by Public Pension schemes among a cross section of countries 2005-2012.

Source: (He, Goodkind, & Kowal, 2016).

From figure 1.5 above we can see that the proportion of the labour force that is covered by various public pension schemes in various countries. From figure 1.5 above we can see that the public pension coverage among the labour is high in countries like Japan, United States, United Kingdom, Italy and Australia. On the other hand, the public schemes pension coverage is low in other countries like Sri Lanka, Thailand, Vietnam and India. It is also important to note that for higher the public pension coverage the pension expenditures may escalate if not appropriately managed. There needs to be a balance between the extent of the public pension coverage and the affordability of having a broad public pension scheme within the country. Many countries have adopted various incentives so as to promote the increase in the voluntary pension schemes. The government in the use of incentives has to carry out a detailed analysis of the amount of incentives given so as not to escalate the pension expenditures.

Low Pension Benefits:

Low pension benefits paid on retirement is one of the major causes of high poverty levels among the old in any society. Low benefits together with low pension system coverage combine to exacerbate the poverty levels among the old in the society (OECD, 2016). Low pension benefits result from various factors that may include; if the pension contribution rates are low the pension benefits will be subsequently low. This is especially true for the DC pension schemes where the pension benefits are calculated on the following basis {Pension benefits = Pension Contributions + Pension Fund investment return –Pension fund management & investment expenses}. Another reason for low pension benefits is low pension fund investment returns and the low returns may result from poor investment decisions being made by pension fund managers.

The low investment returns may also result from a restrictive allowable pension fund policy and laws which mean that the pension fund managers have limited investment options that they can invest the funds in. To boost the pension benefits the following strategies have been adopted as part of broad pension reforms; The contribution rates for various pension schemes has been raised to ensure that on retirement the retirees have access to higher amounts of pension benefits. Another strategy that has been adopted as part of pension reforms is giving incentives to promote increase in the voluntary pension contribution to complement the various mandatory pension contributions. The pension laws have also been changed to allow pension fund managers be able to invest the pension funds in more profitable sectors wither returns.

Need for Pension System Sustainability:

Pension system sustainability has been one of the major driving forces for the increased focus on pension reforms at the global level. The financial impact of the pension system on the rest of the economy especially in the scope of the demography shift and aging of populations being experienced globally. Pension system sustainability needs to be looked at in a broader context and not only the public pension expenditures. The pension system sustainability needs to consider the demography shift dynamics. That entails looking at the

dynamics of the changes in the population mix and make up. An in depth analysis of the pension system sustainability should also include analysis of the pension system design that has been adopted and the pension expenditures (Allianz SE, 2016).

The pension system sustainability can be analyzed using various methods that look at the pension expenditure, demographic dynamics and the type of the adopted pension system. Pension Sustainability Index (PSI) can be used to analyze the sustainability of the pension system in the long run (Allianz SE, 2016). The Pension Sustainability Index (PSI) uses three sub-indicators to gauge the sustainability within the pension system. The (PSI) adopts the demography as a sub indicator where the Old-age Dependency ratio (OAD) is applied in calculating the (PSI). The (PSI) looks at the changes of the Old-age Dependency ratio (OAD) up to the year 2050.

Sub-indicators	Status (0.75)**	Dynamics (0.25)**		
Demographics	Old-age dependency ratio (OAD)*	Change in OAD* until 2050		
	Level of pension benefit from 1st pillar and coverage of workforce	Change in level of pension benefit Reforms passed		
Pension system	Legal / effective retirement age			
	Strength of funded pillar and reserve fund (as % of GDP)			
	Pension payments / GDP			
Public finances	Public indebtedness / GDP	Change of pension payments / GDP until 2050		
	Need for welfare support			

Figure 1. 6 Sub-Indicators of the Pension Sustainability Index (PSI)

Source: (Allianz SE, 2016)

The Pension Sustainability Index (PSI) also looks at various aspects within the pension system that include; the level of the first pillar benefits and the changes in the level of the pension benefit across time. The (PSI) also considers the legal and the effective retirement ages within the pension system. The (PSI) also looks at the public finance as a sub-indicator. Under the public finance the pension payments as a ratio of GDP is considered, public debt/GDP ratio is also considered and to incorporate the long-term horizon the change of pension payments/GDP is simulated up to the year 2050. The Pension Sustainability Index (PSI) ranges between 1 and 10. A Pension Sustainability Index (PSI) is calculated for each sub-indicator and then the three sub indicators Pension Sustainability Index (PSI) is averaged to obtain the total overall Pension Sustainability Index (PSI).

A Pension Sustainability Index (PSI) of 1 indicates a high level of pension system unsustainability, thus a need for major reforms within the pension system. A (PSI) of 10 indicates a high pension system sustainability in the long run and indicates no need for major reforms within the pension system.

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Figure 1. 7 PSI – Total and sub-indicator scores and rankings (Top 10 and Bottom 10) Source: (Allianz SE, 2016)

Figure 1.7 above indicates the top and bottom ten countries ranked on the basis of the Pension Sustainability Index (PSI). The research was conducted in 54 select countries. Australia with a score of 8.08 out of 10 is the country that had the most sustainable pension system globally among the 54 countries considered in this research. Denmark, Sweden, Netherlands and Norway made up the top five of the countries with the most sustainable pension systems. It is important to note that no country had a perfect score of 10 and this means that the sustainability of the pension system could be further improved by improving each of the components of the three sub-indicators that determine the overall Pension Sustainability Index (PSI). Slovenia, China and Thailand with (PSI) of 5.46, 4.98 and 4.94 had the pension systems with the lowest level of long-term sustainability (Allianz SE, 2016).



Figure 1. 8 Shift in Pension Sustainability Index (PSI) ranking 2014-2016. Source: (Allianz SE, 2016)

Appendix 1 and Appendix 2 indicate the Pension Sustainability Index (PSI) for the select countries for 2014 and 2016. This information contained in Appendix 1 and Appendix 2 is summarized in figure 1.8 above. Figure 1.8 above indicates the movement of the rankings of various countries. From figure 1.8 above we can see that five countries; Switzerland, Russia, Ireland, Croatia and Italy had a decline in their Pension Sustainability Index (PSI) between the years 2014 and 2016. On the other hand Chile, Mexico, Malaysia, France and Japan had an increase in their Pension Sustainability Index (PSI) ranking between 2014 and 2016. In a similar research United States, Luxemburg, Singapore, Ireland, Romania and Turkey were able to improve their ranking between 2011 and 2014 as indicated in figure 1.9 below. Hong Kong, Croatia, Taiwan, France, Slovenia and Malta had a decline in their ranking between 2011 and 2014.



Figure 1. 9 Shift in Pension Sustainability Index (PSI) ranking 2011-2014. *Source: (Allianz SE, 2016)*



Figure 1. 10 Current and projected public pension expenditures as % of GDP (2015 and 2050) Source: (Allianz SE, 2016)

From figure 1.10 above we can see that the projected public pension expenditures as a percentage of GDP is projected to increase for most countries and hence emphasizing the need for adoption of pension reforms. Pension reforms need to be adopted now to mitigate against this expected pension system unsustainability expected to result from demographic shifts and increase in the pension expenditures.

CONCLUSIONS

Many countries put in an agenda to reform the old-aged security systems in their various countries. These reforms have been with the aim of averting old age crisis

The report noted that globally there has been the following dynamics within the pension system to address the rising pension challenges. First there have been moves by the various governments to adopt measures to mitigate the rise in the pension costs within their countries. There has also been a decline in the number of the defined benefit pension schemes in favor of the defined contribution pension schemes and transfer of more pension risk to the insurance companies.

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REFERNCES

- 1. OECD. (2016). Pensions at a Glance 2015: OECD and G20 indicators. *OECD Publishing*. Retrieved from http://dx.doi.org/10.1787/pension_glance-2015-en
- 2. OECD 2015, *Pensions at a Glance 2015: OECD and G20 indicators*, OECD Publishing, Paris. Available from: http://dx.doi.org/10.1787/pension_glance-2015-en. [Accessed 8 February 2016].
- 3. OECD. (2013). Pensions at a Glance 2013: OECD and G20 Indicators. *OECD Publishing*. Retrieved from http://dx.doi.org/10.1787/pension_glance-2013-en
- 4. Citi Bank. (2016). Citi GPS: Global Perspectives & Solutions. Citi Bank.
- 5. Allianz SE. (2016). 2016 Pension Sustainability Index. International Pension Papers, 1.
- 6. Moody's Investors Service (MIS) 2014, Population Aging Will Dampen Economic Growth over the Next Two Decades. Special Report.
- 7. Holzmann, R. (2012). Global Pension Systems and Their Reform: Worldwide Drivers, Trends, and Challenges. *IZA Discussion Papers, 6800.* {*Pension reforms are seen as construct of various drives that emanate from the economy; The pension reforms are adopted to mitigate the challenges posed by the drivers; Pension reforms are seen to be more reactionary in nature based on what happens in the economy}*
- 8. He, W., Goodkind, D., & Kowal, P. (2016). An Aging World: 2015. *International Population Reports-U.S. Census Bureau*, P95/16-1.
- 9. He, W., Goodkind, D., & Kowal, P. (2016). An Aging World: 2015. *International Population Reports-U.S. Census Bureau*, P95/16-1.
- Bernanke, Ben S. 2009. "Welcome Address Asia and the Global Financial Crisis." In Reuven Glick and Mark M. Spiegel (eds.), Asia and the Global Financial Crisis. Proceedings of Asia Economic Policy Conference held October 19–20, 2009 Santa Barbara, California.
- Gustman, Alan L., Thomas L. Steinmeier, and Nahid Tabatabai. 2012. "How Did the Recession of 2007-2009 Affect the Wealth and Retirement of the Near Retirement Population in the Health and Retirement Survey?" Social Security Bulletin 72/4: 47–66.
- 12. Burtless, Gary and Barry P. Bosworth. 2013. "Impact of the Great Recession on Retirement Trends in Industrialized Countries." Center for Retirement Research at Boston College.
- 13. Capretta, James C. 2007. "Global Aging and the Sustainability of Public Pension Systems: An assessment of reform efforts in twelve developed countries." Center for Strategic & International Studies, a report of the Aging Vulnerability Index project.
- 14. Andreoua, M., & Pashardes, P. 2009, Income Inequality, Poverty and the Impact of the Pension Reform. *Cyprus Economic Policy Review*, 3(2): 41-55.
- 15. Ante, C. 2008, Pension Policy Reforms in Germany. Hertie School of Governance Working Papers, 10.
- 16. Akobeng, A.K. 2005, Understanding systematic reviews and meta-analysis. *Archives of Disease in Childhood*. 90. pp. 845–848.
- 17. Apfel, K. 2014, Universal pension for Indians. Available from: http://www.livemint.com/Opinion/Dm7077Vme6Sj8dw6GG73sK/Universal-pension-for-Indians.html [Accessed: 29th December 2015].
- 18. Arunachalam, R.S. 2007, *Micro-Pensions in India: Critical Issues, Challenges and Strategies for Future.* Study for CORDAID, NETHERLANDS
- 19. Asher, M. G. 2010, Pension Plans, Provident Fund Schemes and Retirement Policies: India's Social Security Reform Imperative. ASCI Journal of Management, 39(1): 1-18.
- 20. Asher, M.G. 2015, Pension system for the future needs new thinking. Available from:http://www.livemint.com/Money/RPcq0eT6ETpapLgndOOI8N/Pension-system-for-the-future-needs-new-thinking.html
- 21. Asher, M.G. & Bali, A.S. 2010, 'India's Social Security Systems : an Assessment',
- 22. in Asher, M. G., S. Oum and F. Parulian (eds.), Social Protection in East Asia Current State and Challenges. ERIA Research Project Report 2009-9, Jakarta: ERIA. pp. 399-423.
- 23. Asher, M.G., & Fauziah Zen, F. 2015, Social Protection in ASEAN: Challenges and Initiatives for Post-2015 Vision. ERIA Discussion Paper Series.
- 24. Asher, M.G. & Kimura, F. 2015, Strengthening Social Protection in East Asia.
- 25. London: Routledge.
- 26. Asher, M.G. & Nandy, A. 2006, reforming provident and pension fund regulation in India. Journal of

Financial Regulation and Compliance, 14(3): 273 – 284. http://dx.doi.org/10.1108/13581980610685865

- 27. Asher, M.G. & Vasudevan, D. 2010, *Market Structure and Challenges for Annuities in India*. Pension Research Council of the Wharton School of the University of Pennsylvania.
- 28. Asher, M.G., Vorab, Y., & Mauryaa, D. 2015, an Analysis of Selected Pension and Health Care Initiatives for Informal Sector Workers in India. Social Policy & Administration, 49(6): 738–751.
- 29. Ayyadevara, V. K. 2010, has the Indian retirement fund industry come of age? A critical analysis of NPS. PGDM, IIM Calcutta.
- 30. Bali, A.S. 2014, the political economy of pension reforms in India. Public Admin. Dev. 34: 294–304.
- 31. Baroni, E. 2007, *Pension Systems and Pension Reform in an Aging Society An Introduction to the Debate*. Institutet for Framtidsstudier.
- 32. Barr, N., & Diamond, P. 2009, reforming pensions: Principles, analytical errors and policy directions. *International Social Security Review*, 62(2).
- 33. Barr, N., & Diamond, P. 2010, Reforming Pensions: Lessons from Economic Theory and Some Policy Directions. *Economia*.
- 34. Centre for Reviews and Dissemination 2009, Systematic Reviews: CRD's guidance for undertaking reviews in health care. York: University of York.
- 35. Cesaratto, S. 2014, *Pension Reform and Economic Theory*. Edward Elgar Publishing, Business & Economics.
- Chakco, S., Chopra, S., Ekka, P., Gonsalves, S., Kalra, A., & Puri, R. 2013, *Report on Old Age and Widow Pensions in Chhattisgarh Lakhanpur Block, Surguja District*. Public Evaluation of Entitlement Programs (PEEP) Survey 2013.
- 37. Chauhan, P., Kokiwar, P.R., Shridevi, K., & Katkuri, S. 2016, Study On Prevalence And Correlates Of Depression Among Elderly Population Of Rural South India. *International Journal of Community Medicine and Public Health*, 3(1):236-239.
- 38. Chomik, R., & Piggott, J. 2015, Population Ageing and Social Security in Asia. Asian Economic Policy Review 10, 199–222.
- 39. Clements, B.J., Coady, D., Eich, F., Gupta, S., Kangur, A., Shang, B., & Soto, M. 2013, *The Challenge of Public Pension Reform in Advanced and Emerging Economies*. International Monetary Fund.
- 40. Collins, P.D., Podger, A., & Keyong Dong, K. 2014, Public Policy for Pensions Reform: A Governance Challenge for Public Administration and Development. *Public Admin. Dev.* 34, 223–230.