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COMPARISON OF SOCIAL SECURITY SYSTEMS IN DIFFERENT COUNTRIES

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ABSTRACT

Since civilizations were first formed, the public would seek ways to look after deprived members of society. To organize these efforts and provide economic support for all citizens, governing bodies have initiated various programs to help the public maintain standards of living after they have left the workforce. Such benefit systems have developed differently in countries across the world. Some countries have chosen to fund these benefits from a general pool that each citizen pays into, while others accumulate retirement funds, based on employment history, in individual accounts.

This thesis examines nationwide program development in four different countries: the United States, Australia, Chile, and Sweden. The strengths and weaknesses of each social security system are examined. Taking into account these positive and negative societal effects, program improvements are suggested for each country, and recommendations for future studies are made.

TABLE OF CONTENTS

LIST OF FIGURES

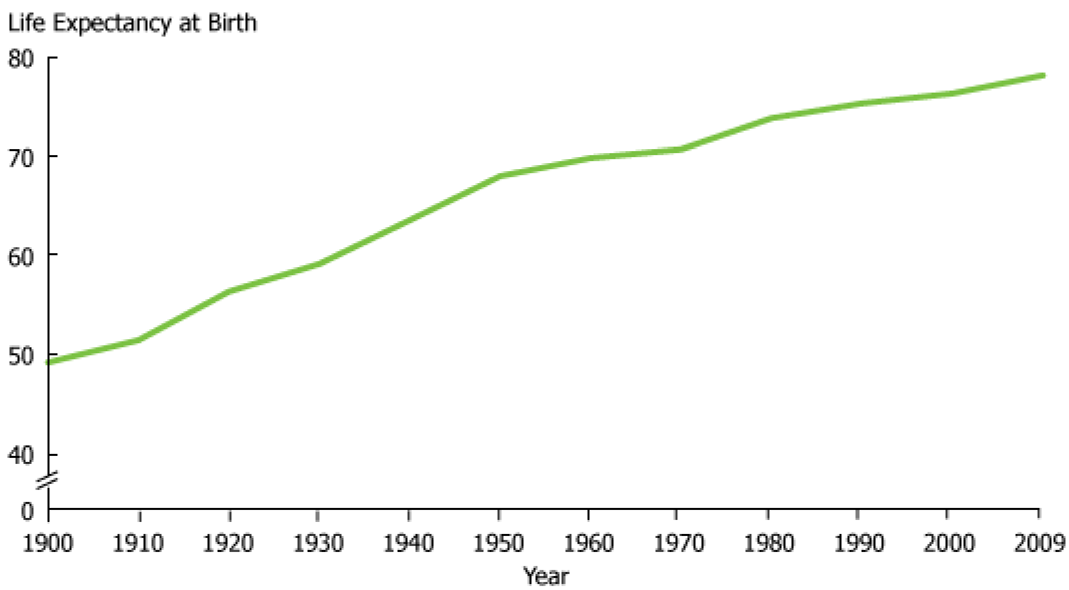
LIST OF TABLES

Chapter 1

Introduction

When individuals reach the end of their working life, personal income can come from a variety of sources in order to maintain their standard of living. Personal savings in individual retirement accounts can be a large portion of this fund, along with pensions from prior employers, or income from assets such as stocks, mutual funds, and home equity. In addition, an increasing number of elderly citizens are continuing to stay in the workforce for extra cash, either full time or part time, working well into their 70s. This trend is primarily due to improved healthcare and an increased life expectancy. Below is a figure depicting the growth in life expectancy at birth in the United States, from 1900 to 2009.

Figure 1-1: Life Expectancy at Birth in the United States from 1900 to 2009



Source: Scommegna, P. (2011, July). More of Us on Track to Reach Age 100: Genes, Habits, Baboons Examined for Longevity Clues. *Population Reference Bureau*. Retrieved from http://www.prb.org/Articles/2011/biodemography.aspx?p=1

Government and employer retirement funding systems in the United Sates were put into place between the 1930s and 1950s. These funds were paid to individuals after they reached age 65. At that time, the average life expectancy at birth was in the mid to low 60s. This was the average of varying life expectancies across the population: many individuals would not live to age 65, but those that made it to age 65 were expected to live much longer, to about age 85. These retirement benefit resources, therefore, were designed to pay only a small percentage of the population after an individual left the workforce in their 60s. Statistics in a more recent year, 2009, show citizen average life expectancy to be closer to 75, as more people are reaching older ages. This trend is similar in countries around the world, and retirement periods continue to increase. Staying in the workforce longer is just one way to fund these lengthening periods. However, if old age prevents civilians from being productive members of the labor force, national retirement programs across the world need to be restructured to provide funds for longer periods of time.

Although personal savings and other retirement funds are needed to maintain pre-retirement standards of living, government support is provided to citizens in order to help them pay for basic needs in the absence of typical income. Across the globe, different countries have initiated systems to provide these necessary assets to citizens. There are two primary fund types used to provide an individual's retirement benefit: defined benefit and defined contribution.

Defined benefit formulas use factors such as length of employment and salary to calculate a specific individual benefit. These amounts are paid out from a general fund that is built up by payments from taxpayers or workers. In these cases, it is the duty of the government or employer to make sure that there are sufficient funds to pay promised benefits to citizens or workers, respectively. The risk is taken on by the government or employer, as they face the possibility of funds not being properly invested and not growing.

Defined contribution funds take a different approach. These are similarly based on salary and length of time employed, but the risk is transferred to the individual worker. A portion of the employee's salary will be contributed to a personal fund. The way that this money is invested determines the individual benefit that will be provided. This funding option relies on the return from investments and the strength of the market.

In this thesis, examples of each government funding option will be provided. Four countries' social security systems will be examined: the United States, Australia, Chile, and Sweden, followed by a discussion of the positive and negative aspects of each social security system. In addition, the systems will be compared, and future recommendations for the programs in each country will be discussed.

Chapter 2

Defined Benefit in the United States

First, it is important to be familiar with the Social Security system in the United States. This pension plan followed the example of Europe. Personal benefits are primarily defined by an individual's work experience in the country. The system has many favorable features, but Social Security's future seems to necessitate change. This section will examine the formation of the social security system, as well as the strengths and weaknesses of how it is structured today.

2.1 Formation of American Social Security

Individuals have always sought economic security. Family members and charities were historically the first entities to provide support to those living with insufficient means. At the beginning of the 17th century, the English governing bodies developed 'Poor Laws' to provide aid for deprived individuals (The United States Social Security Administration, 2012). This sparked the creation of the first formal organizations to look after the economic security of their members. These early regulations came with English colonists when they first arrived in America.

As the country was colonized and societies formed, the Poor Laws were reflected in initial American systems. These benefits were funded by local taxes. Various local leaders would decide if a resident was deserving of the benefits, and how the benefits would be provided. As societies developed and expanded in the country, local systems became inadequate in matching growth. In the 18th and 19th centuries, states attempted to isolate economic problems from the general public. The government tried to discourage poor individuals from depending on societal aid, and influenced other Americans to look unfavorably on these citizens. Poverty relief was provided in specific houses which clearly marked the status of the poor, and actual monetary aid was seldom offered. In order to further motivate self-sufficiency, the poor could have voting or moving rights revoked.

The Civil War was a noteworthy event in the history of social security. The war created a need for public support of disabled veterans, as well as widows or orphans left behind. A Civil War Pension program was started in 1862 to provide money for these members of society in need. The Great Depression of the 1930s also increased monetary needs of the country. Poverty levels grew dramatically during this time, especially for the elderly. In 1934, approximately half of the U.S.'s elderly did not have enough income to support themselves (The United States Social Security Administration, 2012). Some U.S. states began to create local pension plans for the elderly in response to this problem. It was the election of President Roosevelt in 1932, however, that introduced new, lasting ideas about economic security.

As the new president in office, Roosevelt promoted social insurance, rather than welfare benefits. The previously provided welfare benefits would help those in need, but at the cost of other hardworking individuals. In contrast, social insurance benefits are government sponsored funds to provide economic security for individuals in society, often based on personal contributions to the system. Insurance systems such as these were already in place in certain areas of Europe. A new social insurance program would support the elderly through funds from a tax based, work related system. The Committee of Economic Security, made up of five officials, was created to propose a plan of action to introduce this new social insurance system. After consulting with experts and discussing alternatives, the Social Security Act was signed into law in 1935. The Act established taxes to be collected, formed a Social Security Board, and set the goal to pay workers after reaching age 65.

Different working groups were required to participate in the Social Security program at varying times, over a period of about 20 years. The initial law in 1935 covered most commerce and industry workers, which made up about 60% of the work force. At this time, "principal groups excluded from the program were government workers, railroad employees, the self-employed, farm and domestic workers, and employees of nonprofit organizations," according to an article published by the United States Social Security Administration in 2000. In 1950, coverage expanded to include regular farm and domestic workers, self-employed individuals (except farmers), and federal employees. Nonprofit organizations, as well as state or local governments, could also choose to elect coverage for their workers in 1950. A few years later in 1954, self-employed farmers were covered under the system, and ministers could elect coverage. Military employees were made Social Security participants in 1956 (Kollmann, 2000).

In order to register employees to receive their future pensions, the government worked with the Post Office to distribute applications to each individual and collect the completed papers. Numbers were assigned to each post office, and covered Americans were first assigned a Social Security Number. This involved process led to over 30 million SSN cards to be created (The United States Social Security Administration, 2012).

Collection of Social Security taxes started in 1937. From this time until 1940, Social Security funds were built to provide for present and future retirement benefits. Before a secure fund was created, Social Security paid out benefits in a single, lump-sum payment. Benefits as small as 5 cents were paid out, and all benefits averaged $58.06 (The United States Social Security Administration, 2012). According to data in national archives, the average national income in 1940 was $1,368, so these average benefits provide only a minute 4.24 percent of salary (National Archives, 2012). In January of 1940, after the funds were well established, monthly payments to citizens, with values based on working history, began.

Over the following years, various amendments had significant impact on the Social Security system. Benefits for a retired worker's spouse and children were established in 1939. Cost-of -Living-Adjustments (COLAs) were later introduced in October 1950, but these increases did not become automatic until 1972. 1954 was the time period of another major change, as the disability insurance program was initiated. Various other small pieces of legislation were passed throughout the Social Security system's steady growth. Individuals in the United States have become very dependent these benefits. The program expanded from serving 222,000 people in 1940 to 50 million people in 2012 (The United States Social Security Administration, 2012).

2.2 Current U. S. Social Security System

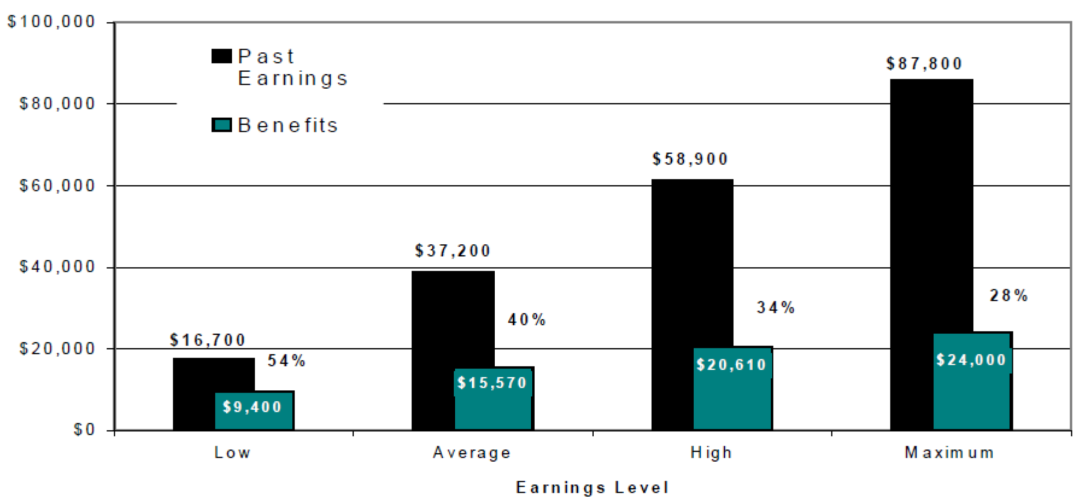
The current Social Security system now includes old age, survivor, and disability benefits. Eligibility for the benefits is based on the 'quarters of credits,' commonly referred to as 'credits,' that an individual earns in their working life. Credits are earned by working in a job covered by Social Security, and earning wages above a certain threshold. Before 1978, earnings were reported every 3 months, and a credit (called 'quarters of coverage' at that time) was earned if at least $50 was earned during that quarter of a year (The United States Social Security Administration, 2012). Since 1978, wages are now only reported once a year, with benefit credits being based on total annual wages earned, up to four credits each year.

The amount of wages necessary to earn a credit in the United States has increased steadily to reflect the increasing average wages in the country. In 1997, one credit could be earned with $670 in covered wages (William M. Mercer, 1997). More recently, in 2012, $1,130 must be earned to gain one credit, or $4,520 must be earned to gain the maximum four credits in one year (The United States Social Security Administration, 2012). In order to get retirement benefits, at least 40 credits (or 10 years of covered work) are needed for those born in 1929 and later.

It is estimated that retirees must replace about 70% to 80% of their pre-retirement earnings in order to keep the same standard of living, according to a report by the National Academy of Social Insurance (National Academy of Social Insurance, 2007). Social Security benefits are only intended to replace a portion of this retirement income. Below is a figure illustrating how much individuals relied on Social Security in 2007, compared to their past earnings. Groups of persons retiring at age 65 are split into four sets of pre-retirement earners. Social Security provides 54% of prior earnings for the lowest salaried individuals, while only providing 28% of prior income for the highest paid workers.

Figure 2-1: Social Security Benefits Compared to Past Earnings in 2007

Figure 1. Social Security Benefits Compared to Past Earnings, 2007
Illustrative Low, Average, High, and Maximum Earner Retiring at Age 65



Source: Board of Trustees 2007. Low earnings are 45 percent of the average wage; high earnings are 160 percent of the average wage.

Source: Reno, V., & Lavery, J. (2007, May). Social Security and Retirement Income Adequacy. *National Academy of Social Insurance*. Retrieved from http://www.ncpssm.org/pdf/nasi-report.pdf

Comparison of the Social Security benefits per wage level shows that lower paid workers are provided with a larger share of past earnings than high earners. This progressive payment formula recognizes the fact that workers with lower wages are less likely to have personal savings or pensions to use in retirement, so a greater portion of their income is needed to meet basic needs. Lower income workers also only receive a small decrease in taxes at retirement, so require a replacement rate closer to their actual income in order to maintain their living conditions.

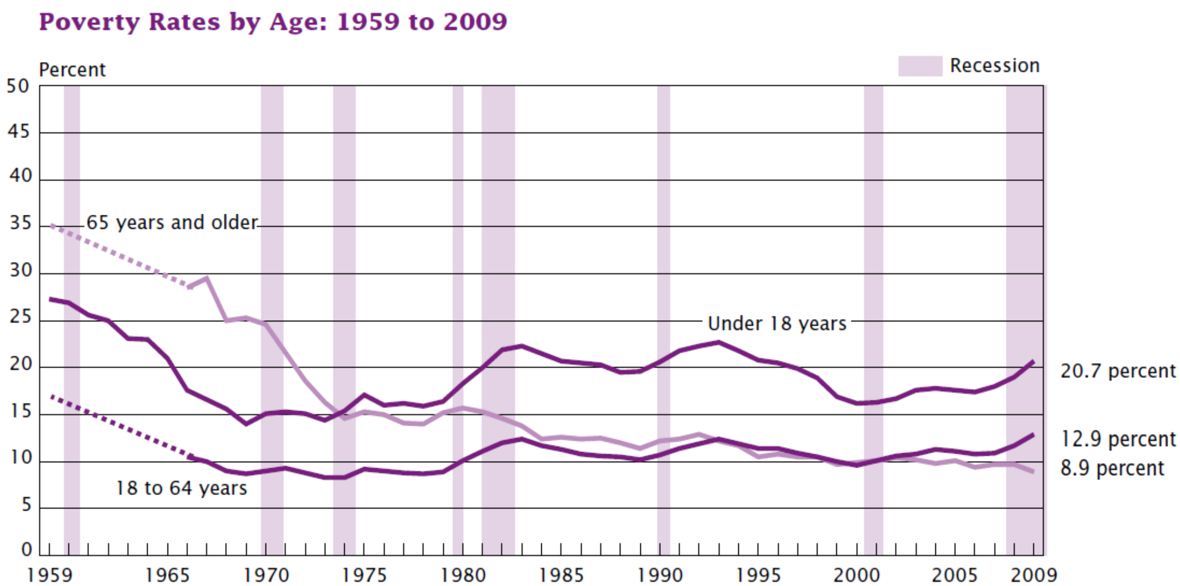
Normal retirement age, also referred to as full retirement age, is presently between 65 and 67, based on year of birth. This age is referred to as the Social Security Normal Retirement Age, or SSNRA. An individual may elect to receive retirement benefits commencing before or after their SSNRA, with benefit amounts being reduced or increased, respectively. Payments can currently be taken as early as age 62 or as late as age 70, regardless of full retirement age.

2.3 Strengths and Weaknesses of the U.S. System

The Social Security system in the United States has many favorable features, including the aforementioned progressive formula. The system also has broad coverage over the country, paying benefits to low earning citizens as well as those with higher wages. The system has evolved throughout its history to provide benefits effectively and efficiently from a simple defined benefit formula. The efficiency of this system is proven by its low administrative costs. According to the National Academy of Social Insurance in 2007, administrative expenses are less than 1 percent of Social Security funds collected.

Benefits are also indexed for inflation, so that retirees will not be caught off guard by changes in the dollar’s worth. The decrease in benefits for early retirement prevents "leakage" from early withdrawals from the funds. The pension plan has successfully decreased old age poverty significantly over a 50-year period, as depicted in the figure below. Poverty percentages are categorized by age level. In 1959, the poverty rate for Americans over 65 was 35.2%. Recently, in 2009, that percentage had decreased to 8.9% (Urban Institute, 2010).

Figure 2-2: U.S. Poverty Percentages by Age from 1959 to 2009



Notes: The data points are placed at the midpoints of the respective years. For information on recessions, see Appendix A. Data for people aged 18 to 64 and 65 and older are not available from 1960 to 1965.
Source: U.S. Census Bureau, Current Population Survey, 1960 to 2010 Annual Social and Economic Supplements.

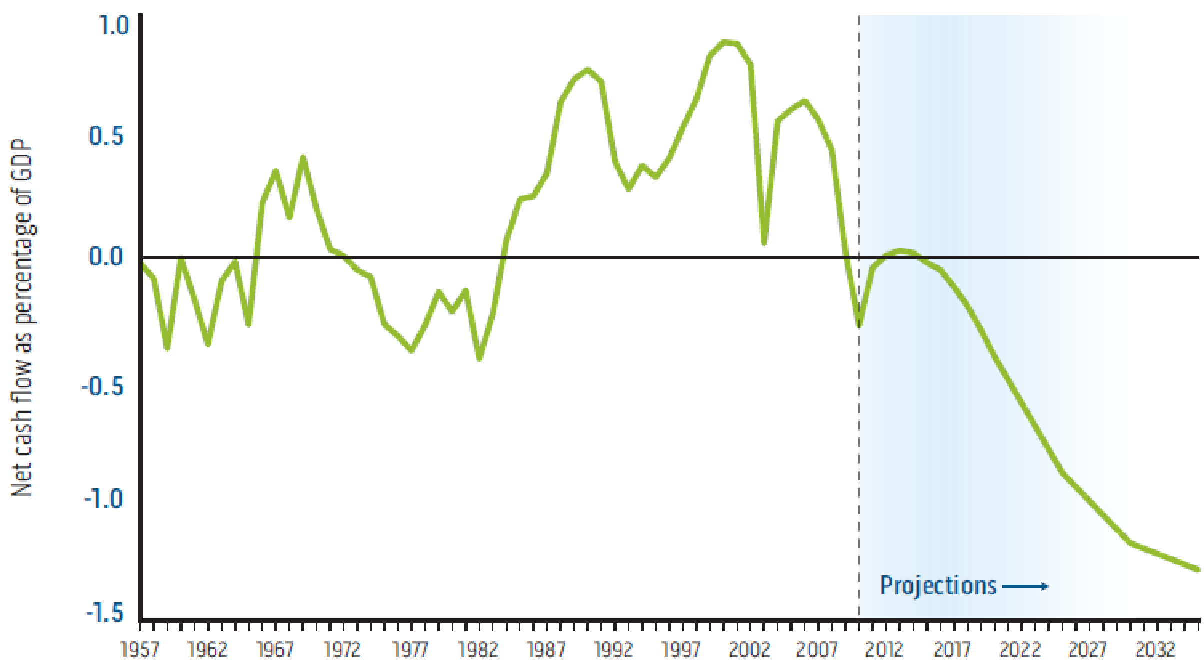
Source: Income, Poverty, and Health Insurance Coverage in the United States: 2009. (2010, September). *U.S. Census Bureau*. Retrieved from http://www.census.gov/prod/2010pubs/p60-238.pdf

Despite the program's success, lower wage workers often find themselves with insufficient funds, even after working a long career. The replacement rate in the United States, or the ratio of retirement benefits to pre-retirement earnings, is low in comparison to other countries. In a study by the Organisation for Economic Co-operation and Development (OECD), replacement rates were compared for low earners in 30 different countries. Under the countries' respective pension plans, the United States only provided a higher replacement rate than three other countries in the group (National Academy of Social Insurance, 2007). This low replacement rate, however, can also be considered a positive because it requires less funding and fewer resources. The formula that allows accumulation of these benefits prevents social security taxes from being a significant strain.

In addition, citizens and organizations have concern for the future of the system. Retiree payments are being funded through current workers' payroll taxes. This scheme has been effective in the past, but is beginning to create a problem as people now live longer and have fewer children. A great portion of society is made up of the "baby boomer" generation, those born between 1946 and 1964. These individuals are starting to reach retirement age, resulting in a significant draw from Social Security tax payments and reserves. In addition, as fewer individuals will remain in the workforce, there will be a decrease in Social Security tax dollars to fund future benefits.

As time progresses, these trends are expected to continue, so that there will not be enough support to fund Social Security benefits in the near future. Below is a figure depicting Social Security's net cash flow as percentage of GDP from 1957 to 2035 (Urban Institute, 2010). As illustrated in the graph, Social Security has survived periods of negative cash flow before. Projections from 2010 forward show that cash flows are expected to become positive for a short time in 2013 or 2014. Over the longer term, however, cash flow as percentage of GDP is decreasing and negative. As a result, it is expected that the Social Security reserve will be depleted by 2037, at which time only about three-quarters of the promised benefits could be provided (Urban Institute, 2010).

Figure 2-3: Social Security's Net Cash Flow from 1957 to 2035



Source: Board of Trustees (2010).

Note: Estimates show (1) actual net cash flow of the old-age and survivors and disability trust funds combined from 1957 to 2009, and (2) projections from 2010 to 2035, based on the 2010 trustees' assumptions.

Source: Lei, S. (2010, November). The Future of Social Security. *Urban Instititute*. Retrieved from www.urban.org/uploadedpdf/412253-Social-Security-Solvency.pdf

Chapter 3

Social Welfare in Australia

Australia's Social Security system is one example of a social welfare plan that developed differently than the program in the United States. Australia's national plan was put into effect slightly over 100 years ago, and thus is older than the U.S. Social Security system. There have been many small changes to the benefits offered over the years, but the system's main structure has remained the same since its inception. This chapter will discuss the formation and the current structure of the social welfare system in Australia.

3.1 Early Australian Welfare

Before the 20th century, there was no social security system in Australia. Rather, the territory was made up of self-governed British colonies, which took responsibility for caring for the aged. Charitable organizations and volunteers would help individuals in need of assistance, such as mistreated children, pregnant women, and the sick or poor elderly. The economic depression of the 1890s made clear the need for a system to help the disadvantaged.
Both Denmark and New Zealand had enacted old age pensions, or pensions given to individuals specifically once they reached the age of 65, in the late years of the 19th century. Following this example, the two territories of New South Wales and Victoria started offering similar pensions in 1900 (Herscovitch & Stanton, 2008).

Shortly thereafter, in January of 1901, the Commonwealth of Australia was formed when six colonies joined to write a constitution and become Australian states (Australian Bureau of Statistics, 2009). The states included mainland territories - Western Australia, South Australia, Queensland, New South Wales, and Victoria - as well as the island of Tasmania. This constitution gave the new Parliament authorization to enact laws that allowed pensions to be given out based on age and disability.

A pension system covering all Australian states was not put into effect until July of 1909 (Australian Bureau of Statistics, 2009). Then overseen by the Department of the Treasury, flat rate pensions were paid to individuals after they reached a certain age. Men began to receive pensions at age 65, and in December of 1910, women also became eligible to receive a pension at age 60. This was in part because women were typically younger than their working husbands. Despite the age difference, men and women preferred to coordinate their retirement, so retirement ages for women were made a few years earlier than men's retirement ages. No early payment of this pension was allowed. An additional requirement was that individuals had to be an Australian resident for 25 years. The residence qualification was shortened to 20 years a short time later (Australian Bureau of Statistics, 2009).

At first, the old age pension would pay £26 per year, approximately $52, to replace approximately 21.6% of average pay (Financial Demographics Pty Ltd, 2004). In order to limit the cost of providing these pensions, means and asset tests were introduced in 1908. Individuals with incomes of more than £52 ($104) per annum or property worth more than £310 ($620) became ineligible to receive the pension (Skwirk, 2012). These benefits were financed from general taxation, rather than employer and employee contributions. Because all Australian citizens paid into this fund, individuals felt that they had earned the right to receive their benefit. The inability of some higher paid workers to gain access to these funds, however, created resistance within the community, and encouraged some employment history falsifications.

Since the birth of this system, there have been frequent changes in what benefits are offered and how they are calculated. One such alteration occurred in 1961. Instead of separately testing income and property owned, the two tests were merged. Pension eligibility was based on personal earnings plus 10% of the individual's property value (Australian Bureau of Statistics, 2009). Varying pension rates were later introduced in 1963, giving single individuals a higher percentage of compensation than they would give to married individuals. A higher rate was also allowed for widowed mothers. Married couples had two sets of benefits going into a fund to support them, so they did not need as much as either single citizens or widowed mothers. Some other notable events include the development of the Commonwealth Department of Social Services in 1939, and a residence qualification reduction from 20 years to 10 years in 1962 (Australian Bureau of Statistics, 2009). Pension allowances for families, disabilities, and sickness have also become part of the welfare program.

3.2 Current Australian Pension System

Currently, the pensions paid out of the Australian social security system are more complex than they were in the early 1900s, but the basic model of the system has remained the same. To be eligible to receive the pension, the individual must meet age and residence requirements. The 10-year residence requirement is still in place, meaning that a person must be a resident for at least 10 years continuously. If an individual has also resided in other countries, then the numerous periods of residence in Australia must total more than 10 years, with one of the periods being at least 5 years (Australian Government, 2012). The eligible pension age is dependent on birth year. Before 1949, women were able to retire at a younger age than males, but both sexes have the same retirement age in later birth years. Women’s eligibility varies between 60 and 67 years, and eligibility for men has a smaller range of 65 to 67 (William M. Mercer, 1997). Below is a table that illustrates when men and women are eligible to receive their pension.

Table 3-1: Australian Eligible Age Limits

Born	Women eligible for Age Pension at age	Men eligible for Age Pension at age
Before 1 July 1935	60	65
Between 1 July 1935 and 31 December 1936	60 and a half	65
Between 1 January 1937 and 30 June 1938	61	65
Between 1 July 1938 and 31 December 1939	61 and a half	65
Between 1 January 1940 and 30 June 1941	62	65
Between 1 July 1941 and 31 December 1942	62 and a half	65
Between 1 January 1943 and 30 June 1944	63	65
Between 1 July 1944 and 31 December 1945	63 and a half	65
Between 1 January 1946 and 30 June 1947	64	65
Between 1 July 1947 and 31 December 1948	64 and a half	65
Between 1 January 1949 and 30 June 1952	65	65
Between 1 July 1952 and 31 December 1953	65 and a half	65 and a half
Between 1 January 1954 and 30 June 1955	66	66
Between 1 July 1955 and 31 December 1956	66 and a half	66 and a half
After 1 January 1957	67	67

Source: Eligibility for Age Pension. (2012). *Australian Government: Department of Human Services*. Retrieved from http://www.humanservices.gov.au/customer/enablers/centrelink/age-pension/eligibility-for-age-pension

Once a resident becomes eligible to receive the pension, he or she must apply for an Age Pension. The benefits paid out are still dependent on both the person's income and assets. After payment is calculated under both the income and asset means tests, the test resulting in the lower rate will apply to an individual's benefits. When applying the tests, certain income and asset value limits are set for individuals with different familial status. If earned income exceeds the maximum amounts, then the individual will not receive the Age Pension (National Welfare Rights Network, 2012). For those that pass both tests, pension payments are received biweekly.

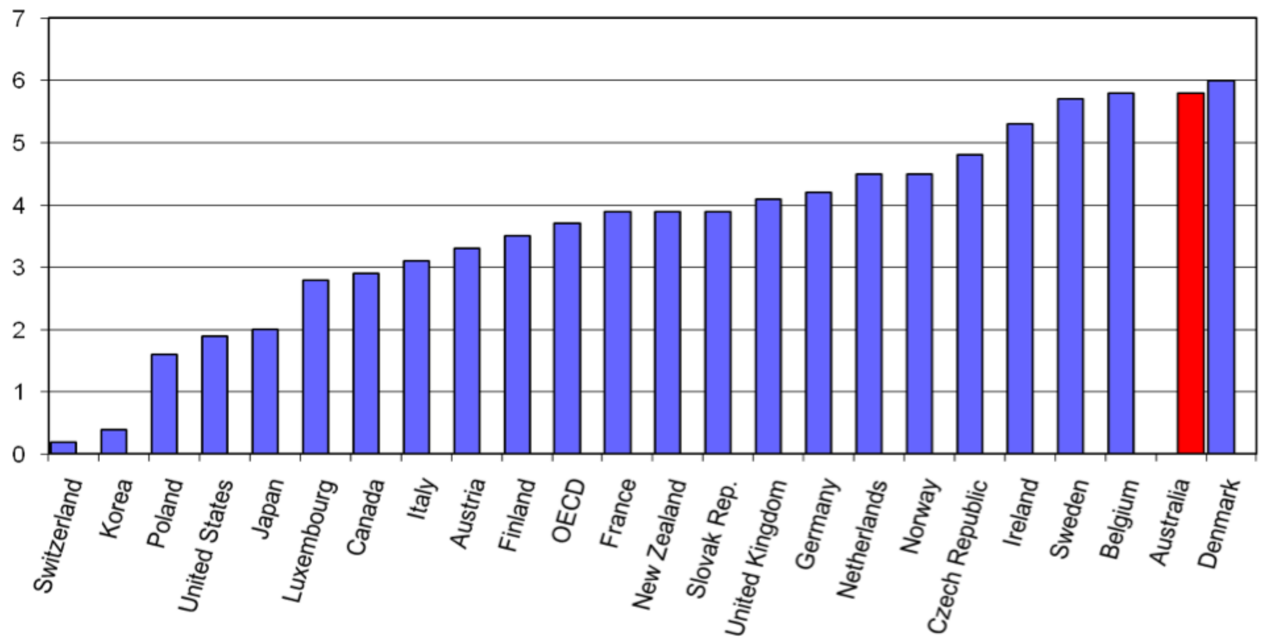
3.3 Strengths and Weaknesses of Australian Social Welfare

According to a study of multiple OECD (Organisation for Economic Co-operation and Development) countries, Australia is shown to have one of the most efficient systems of the countries in question on certain metrics. Each dollar spent on retirement benefits reduces income inequality by about 50% more than the effect of a dollar spent in the United States (Whiteford, 2011). This effect, however, could understandably be met with some public resistance, as highly paid individuals could feel as though they have earned a greater benefit than the flat rate they are receiving. This is one of the reasons that benefit formulas in the United States have been structured to reflect individual earnings.

The Australian government has also introduced a very progressive system of income taxes within the country. This stems not from the fact that high paid workers are heavily taxed, but that low income Australian groups pay much lower taxes than similar groups in other countries. The benefit of this system is evident when considering how the poor are treated. Below is a figure depicting benefits after taxes for the poorest 20% of the population in multiple OECD countries. To produce this calculation, spending on social security benefits is estimated as a percentage of household disposable income for the poorest fifth of the population. Similarly, taxes are estimated as a percentage of household disposable income for the poorest quintile. Subtracting these two amounts yields 'net redistribution.' As shown, Australia redistributes a sizeable percentage of income to the poor (more than 5%), while some countries such as the

United States only redistribute about 2% of household disposable income to low-income households (Whiteford, 2011).

Figure 3-1: Net Redistribution to the Poor in 2005



Source: Whiteford, P. (2011, July 11). How fair is Australia's welfare state?. *Inside Story*. Retrieved from http://inside.org.au/ how-fair-is-australia%E2%80%99s-welfare-state/

Despite the generous effects of income regulation for the poor, this equality of benefits causes some disadvantages. Equal payments regardless of salary level can dishearten Australian workers from striving to get higher paying jobs. Individuals may be more inclined to accept lower paying and less taxing jobs, because their eventual retirement benefit will not be improved after showing greater ambition in the workforce. Likewise, personal savings are discouraged by this system. Although such savings could of course help an individual comfortably retire, likeness of benefits across the population does not provide a drive for people to define their own retirement income.

Chapter 4

Defined Contribution in Chile

Other countries around the world had similar social security beginnings as the United States. Many of these have already been forced to deal with the challenges of sustaining defined benefit systems. This chapter will examine the story of one such country: Chile. The country's original defined benefit system was completely restructured in the 1980s, and the social security system now embraces a defined contribution scheme. Looking at the history of Chile's national pension, as well as the way it is structured today, can give a new viewpoint on social security systems.

4.1 Creation of Chile's Defined Contribution System

When social insurance was first introduced in Chile, it was a small program formed in 1855 solely to cover the armed forces (Andrews & Brown, 2009). Social insurance gradually spread across the country over the next century. The Chilean government in 1924 passed the first law establishing a national social insurance system for old-age workers. However, rather than putting in place one system for all residents, different private and public programs were created as various sectors recognized the need for benefits. These programs were primarily based on occupation category. Some of the main categories were government employees, salaried employees, and manual workers. In the early 1970s, these three programs covered 90% of the workers in Chile, while the other 10% of Chilean workers received benefits from upwards of 30 other programs within the country (Kritzer, 1996).

According to a Social Security Bulletin published in 1996, this sporadic formation of social security systems caused drastic inequality of benefits across the population. Each small system used a different formula in order to calculate benefits. For instance, salaried employees could receive up to 100% of their final average income as a benefit, while manual workers could only receive up to 70% of their final earnings (Kritzer, 1996). Additionally, each system had different retirement requirements, so there was no uniform retirement age. Another disadvantage of the system was that it turned out to be a heavy burden on the economy. State contributions to retirement funds were drawn from various tax bases, as mandated by law. Due in part to these needed retirement funds, the payroll tax amount for all benefits was increased to 65% of income in the early 1970s (Andrews & Brown, 2009). High taxation also persuaded employers to evade these high fees by not hiring additional workers, or by illegally keeping employees from being recognized on their payroll.

A minimum pension component is noteworthy, as it may have the effect of further encouraging evasion of social security contributions. At the time, a minimum pension was guaranteed regardless of an individual's lifetime earnings. The pension amount was based only on salary during the last 5 years of work before retirement (Kritzer, 1996). Since entire work history does not have to be accounted for in order to receive a good pension, it is suspected that both workers and employers would use evasion tactics to their advantage. As a result, the social security systems, run on a pay-as-you-go basis, often had difficulty gaining adequate funds to pay retirement benefits.

Matters were made worse when an economic crisis hit Chile in the early 1970s. In an effort to increase employment rates, the Chilean government tried to entice more citizens to work by lowering social security contribution rates. This action did not have the desired effect, however, as participation rates remained low. State and government funds continued to bear a heavy burden in order to pay out worker benefits. This continued strain on government funds was the motivation to transfer retirement risk to individual workers by using a different benefit system.

4.2 Current System Structure in Chile

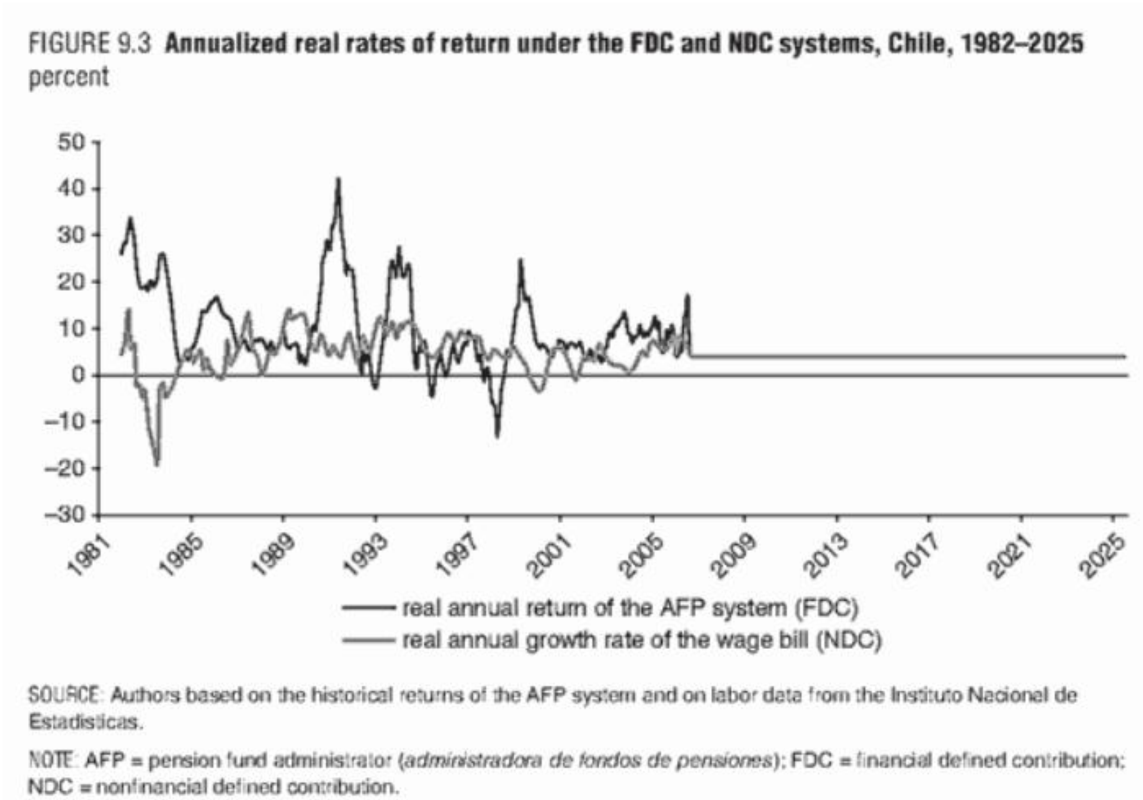
In May of 1981, the military dictator of the Chilean government caused the transition from a publically funded social security program to required individual funds. The system was set up as a defined contribution system. Retirement age was made uniform across the population; being 65 for men and 60 for women. Employers consequently had no required contribution into retirement funds for their workers. Workers were required to contribute 10% of wages (subject to a maximum earnings ceiling) into their own individual retirement funds each month on a tax-deferred basis (Indemoto, 2000). Additional personal contributions could be made up to 10% of salary, but these were not technically considered as social security contributions, so they were subject to income tax and were held in a separate savings account.

The old system was closed to new entrants and was set to be phased out gradually. Workers in the old defined benefit system had the choice of whether or not to receive benefits under the new system. To entice workers into the new system, the government mandated that employers offer a raise to workers that elected to receive benefits under the new system. Employers would give these individuals a one time, 18% increase in salary. Since workers were required to contribute an increased amount of salary to social security funds, this raise translated to 11% more dollars for Chilean citizens that switched. Although employers now had to pay employees a higher salary, the elimination of 11% to 16% of payroll social security contributions resulted in employer cost staying about the same (Kritzer, 1996). These incentives, along with heavy propaganda when the system was introduced, caused over 90% of working individuals to transfer to the new system (Solowey, 1996).

Workers who had contributed to the defined contribution system for at least 12 months in the 5-year period before 1980 were promised a bond equaling the value of their accrued benefit under the old system. These old benefits were first funded by a social security employer tax, but are now paid out of government general revenue. The ability of the government to pay these funds is determined by taxation abilities and economic strength. These expenses are expected to continue until the youngest pay-as-you-go contributors retire around 2025, and will be a significant draw on government assets (Andrews & Brown, 2009). In order to help settle these costs, the government sold many state-owned enterprises to private businesses.

In the new system, employers withhold social security funds from paychecks, but then these sums of money are handed over to private companies. These companies take responsibility for investing social security funds. They are commonly referred to as AFPs (Administradoras de Fondos de Pensiones). Individuals can choose only one AFP to manage their single retirement fund. In 1981, there were 12 AFPs to choose from, and it was possible to switch between AFPs every 4 months (Kritzer, 1996). Despite being under strict government regulation, these businesses freely compete. To attract investors, each company strives to provide the highest returns on social security funds. From 1981, history has shown highly variable but mostly favorable returns from these companies. Below is a figure depicting the AFP rates of return and wage growth since the inception of Chile's defined contribution system until 2025. As can be seen in the graph, despite times of low returns or negative growth, the system has overall provided positive results. In favorable early years, from 1981 to 2006, the average rate of return was 10.3%, with a standard deviation of 8.2% (Cerda, 2008).

Figure 4-1: Chile's AFP Rate of Return and Wage Growth in Percentages from 1982 to 2025



Source: Holzmann, R. (2012). *Nonfinancial Defined Contribution Pension Schemes in a Changing Pension World Volume 1: Progress, Lessons, and Implementation.* (p. 289). Washington, D.C.: The World Bank.

After reaching retirement age, a worker can decide to take their retirement benefit in an annuity, in scheduled withdrawals from the account, or as a combination of both. Account withdrawals hold the possible benefit of high returns, while the other option of taking an annuity will provide a guaranteed, but rather conservative, rate. If the insured citizen dies before they have exhausted their account value, dependents may receive the rest of the value in the account only if withdrawals are chosen. In contrast, account withdrawals also introduce the risk of outliving the amount of savings, while an annuity will be guaranteed for life.

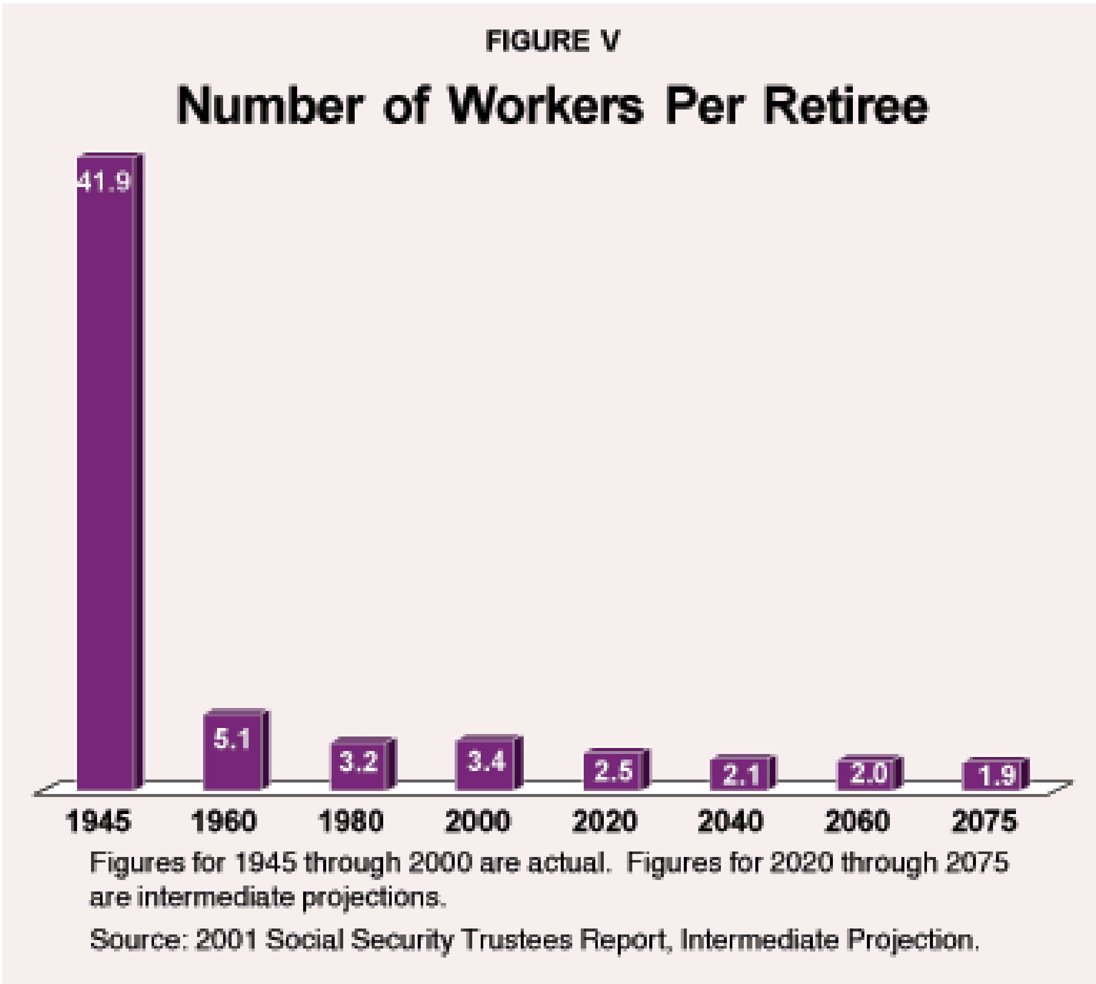
In the case that an individual does exhaust any savings before death, a minimum pension was established to help individuals out. These costs are borne by the government, but minimum funds provided a very low amount, set at only three quarters of the poverty level (Solowey, 1996). Minimum pensions are also available to workers with at least 20 years of working experience but with a funding account value lower than the minimum amount set by law.

4.3 Strengths and Weaknesses of Chile's Defined Contribution

One primary concern of such a drastic social security system change is the cost of the transition. Benefits must be paid from the old system at the same time there is a decreasing number of contributors to the system. If the new benefits are to be fully funded, then no amount of new contributions can be used to pay the promised amounts in the old system. This puts a financial strain on the government, at the same time that it requires a great amount of recordkeeping. Regulation of AFPs is also an added expense for the Chilean government. AFPs themselves have high administrative costs for workers to pay, which are commonly determined as a percentage of contributions and reduce the individuals' accounts.

In Chile, this transition was eased because of the proportion of workers to retirees in the country. In 1981, there were nine workers to each single retiree in Chile (Kritzer, 1996). In contrast, the United States had fewer than four workers per retiree in the same year. These portions within the United States are on a decreasing trend. Below is a figure depicting actual number of workers per retiree from 1945 to 2000, as well as the projected number of workers per retiree from 2020 to 2075.

Figure 4-2:Number of Workers per Retiree in the U.S. from 1945 to 2075



Source: Goodman, J., & Moore, M. (2001, November 30). Government Spending on the Elderly: Social Security and Medicare. *National Center for Policy Analysis*. Retrieved from http://www.ncpa.org/pub/st247?pg=4

A pertinent benefit of using defined contribution systems rather than defined benefit is that individual workers can relate their contributions to their future benefits. This has a few positive effects. If an individual is not able to connect a current hardship to a future positive, then they will undoubtedly be likely to resist the current difficulty. Tax evasion in earlier Chilean history, when workers would lie about employment, is an example of this resistance. Rather than view current social security contributions as a burden, however, the connection between benefits and contributions helps an individual worker understand that their contributions will help fund their retirement later in life. Thus, individuals will be more willing to make an effort to increase savings.

As was previously mentioned, labor market distortions in Chile were common before the defined contribution system was put into place in 1981. Such distortions include workers receiving wages without officially being on a company's payroll, paying contributions on only a certain percentage of their salary, and similar occurrences. These incidences were motivated by the fact that each resident would receive the same minimum pension, despite employment history falsifications. The new system has caused more individuals to be truthful about their employment status so that they can receive their earned pension benefit rather than the much smaller minimum benefit. This effect, and the tendency to save more, both have the power to help economic growth. However, it is still a risk that individuals with low pay will avoid paying their contribution so that they can instead receive the minimum pension.

Chapter 5

Notional Defined Contribution in Sweden

Sweden's social security system is the final program in this paper used to contrast with defined benefit in the United States. The country started with old-age pensions similar to the United States, Australia, and Chile. However, Sweden has gone through the most recent system reform of these four countries. Sweden has been able to take cues from historical social security examples in other countries. These lessons, both good and bad, have played a part in the creation of a relatively new pension scheme.

5.1 Development of Notional Defined Contribution

The first national pension system was established in Sweden in 1913. This was a universal old-age pension scheme, covering all residents after their 67th birthday. A basic pension was paid to individuals who had been paying into the national insurance fund through income taxes. If individuals had a small basic pension, a supplemental pension would be paid to keep these citizens from needing poor relief. Despite the efforts to provide relief to the elderly, both basic and supplementary pension amounts were so small that a majority of old citizens needed poor relief (Harrysson & Edebalk, 2010).

Legislation of 1935 and 1937 brought a significant change to Swedish pensions. While universal coverage and coordination of pensions was maintained, benefits started to be indexed to costs of living in 1937. City residents reaped a much greater benefit from these changes than those in the countryside. Poor relief was still needed for 30% of the retired and disabled (Harrysson & Edebalk, 2010).

Further steps were taken to solve this problem, and 3 pension alternatives to choose from were presented in 1945. The main goal of this law was to provide citizens with suitable income to manage living expenses without the aid of poor relief. Two of these pension options involved a means test, while a third option was an equal flat rate pension for all Swedish citizens. After some deliberation, the flat rate option was chosen in 1946. This pension system turned out to be more expensive for the state, but administration would be easy. In addition, since each person would receive the same pension amount, individual savings were promoted. General taxation would fund these benefits. This National Pensions Act was started on January 1, 1948 (Persson, 1949).

Small adjustments were made to the system over the next decade, until another major reform in 1960. At that time, basic and supplementary benefits were calculated based on salary history. Individuals were eligible to retire at age 65, if they had worked for at least 30 years. Pension levels were based on highest levels of income in their working life, yielding between 60% and 65% of pre-retirement salary for Swedish citizens (Andrews & Brown, 2009). From the 1970s to early 1990s, economic growth slowed drastically within the country. Additionally, an aging population resulted in social security spending that drastically exceeded economic growth. The need for a sustainable program was recognized at the end of the 20th century.

5.2 Sweden's Current National System

In 1999, a pension program was adopted to alleviate the previous problems caused by demographic changes. Pension benefits in Sweden were still paid in part on a pay-as-you-go basis. These funds came out of a general national account, created by a portion of payroll taxes. A different percentage of payroll was also taken to build up personal benefit funds for Swedish workers, accumulating a defined contribution benefit for individuals. Mandatory contributions and payments associated with the pay-as-you-go scheme were linked to economic growth. Similarly, pension benefits took average income growth into account.

At the time of system introduction, both employer and employee contributions totaled 18.5% of individual annual income. 2.5% of salary units went toward defined contribution benefits, and the money was put into an individual account to earn interest. The insured could personally choose an investment manager for this individual account since the year 2000. The remaining 16% of salary was paid into the general pay-as-you-go social security fund to pay for their Notional DC pensions (International Group Program, 2011). Personal contributions to this general account were recorded for bookkeeping purposes, but the funds were not held in actual personal accounts. These nonfinancial accounts, with no actual assets, were called notional accounts. Employee benefits at retirement were a combination of personal account assets in actual investment funds and notional account assets growing at a 'virtual' rate of return.

Transition from the old system to the new has created a graded benefit for workers who have contributed to both systems. People born prior to 1938 are receiving benefits solely from the old defined benefit system, and those born in 1954 or later will only receive benefits under the new NDC pension scheme. Those born between 1938 and 1953 will receive a weighted average of their benefits, based on their personal payments to the old and the new systems.

According to the Swedish National Social Insurance Board, a new component of this notional defined contribution (NDC) system was introduced in order to ensure that the program would remain financially stable. The Automatic Balance Mechanism (ABM) in the Swedish system guards against a discrepancy in assumed versus real economic growth. If necessary to ensure proper funding, this mechanism would reduce current and future payments. To facilitate ABM use, assets and liabilities of the pension system are calculated annually, purely using historical transactions (Settergren, 2001).

A balance ratio is calculated using contribution assets from the past, pension liabilities that will be due, and a 'buffer fund' value. This buffer fund value is the only element of the equation that is not based on a person's past salary history. Rather, this fund ties in with transactions on the capital market. The ratio formula is shown in the figure below.

Figure 5-1: Swedish ABM Balance Ratio Formula

$$\textit{Balance ratio}^{19} = \frac{\textit{Contribution asset} + \textit{Buffer fund}}{\textit{Pension liability}}$$

Source: Settergren, O. (2001). Automatic Balance Mechanism of the Swedish Pension System. *The National Social Insurance Board.* Retrieved from http://www.ap4.se/upload/Engelska%20dokument/Balansering.pdf

Ratios greater than 1 signifies that the system can meet all obligations with some funds left over. Ratios less than 1 are a clue that the system is in financial imbalance. In these cases, benefits will be adjusted down in order to match the asset growth in the system.

5.3 Strengths and Weaknesses of Notional Defined Contribution

In contrast to the defined contribution model in Chile, notional defined contribution benefits do not provide as clear a link between personal contributions and future benefits. There is limited information about the value of personal accounts in the notional system. Although past contributions and expected returns are known, actual benefits are difficult to predict because of uncertainties in the market and with the balancing mechanism. Because of this uncertainty, individuals may be inclined to stay in the workforce longer, or cause labor market distortions such as evasion. The lack of a real account will also do little to encourage savings.

A different argument supporting notional defined contribution models states that since retirement benefits are so closely tied to contributions during working life, individuals are more inclined to participate in the workforce. Use of virtual accounts successfully helps avoid real market risk, although demographic risk can have the same effect on intended pensions if the ABM balance ratio falls below 1.

Administrative costs of this system can potentially be lower than the fees in a normal defined contribution system. Since hypothetical rather than real accounts hold the individual contributions, it is not necessary to have multiple companies managing the funds. This is not the case in Sweden, however, as there is a defined contribution portion with investment options in almost 700 funds. Additionally, the start up costs of a notional defined contribution can be enormous, because an adequate computer system must be developed to keep track of notional accounts.

Sweden also has a minimum pension system, indexed to the cost of living, which is in place to help all residents. Similarly to the minimum pension in Chile, this can provide residents with a reason to stay out of the workforce or to lie about their working history. Further, as noted by the Nordic News Network, many pension funds have been investing in foreign stocks rather than in the Swedish economy. This transfer of capital out of the country can hurt economic stability and development (Hagberg & Wohlner, 2002).

Chapter 6

Suggested Improvements to the Four Social Security Plans

After taking a brief look at the social security systems in 4 countries - the United States, Australia, Chile, and Sweden - we can now turn our attention to examining what system components are inadequate and could be improved. No single system is completely satisfactory, and each has faults that could be partially remedied. This section will mention possible alterations to the social security plans.

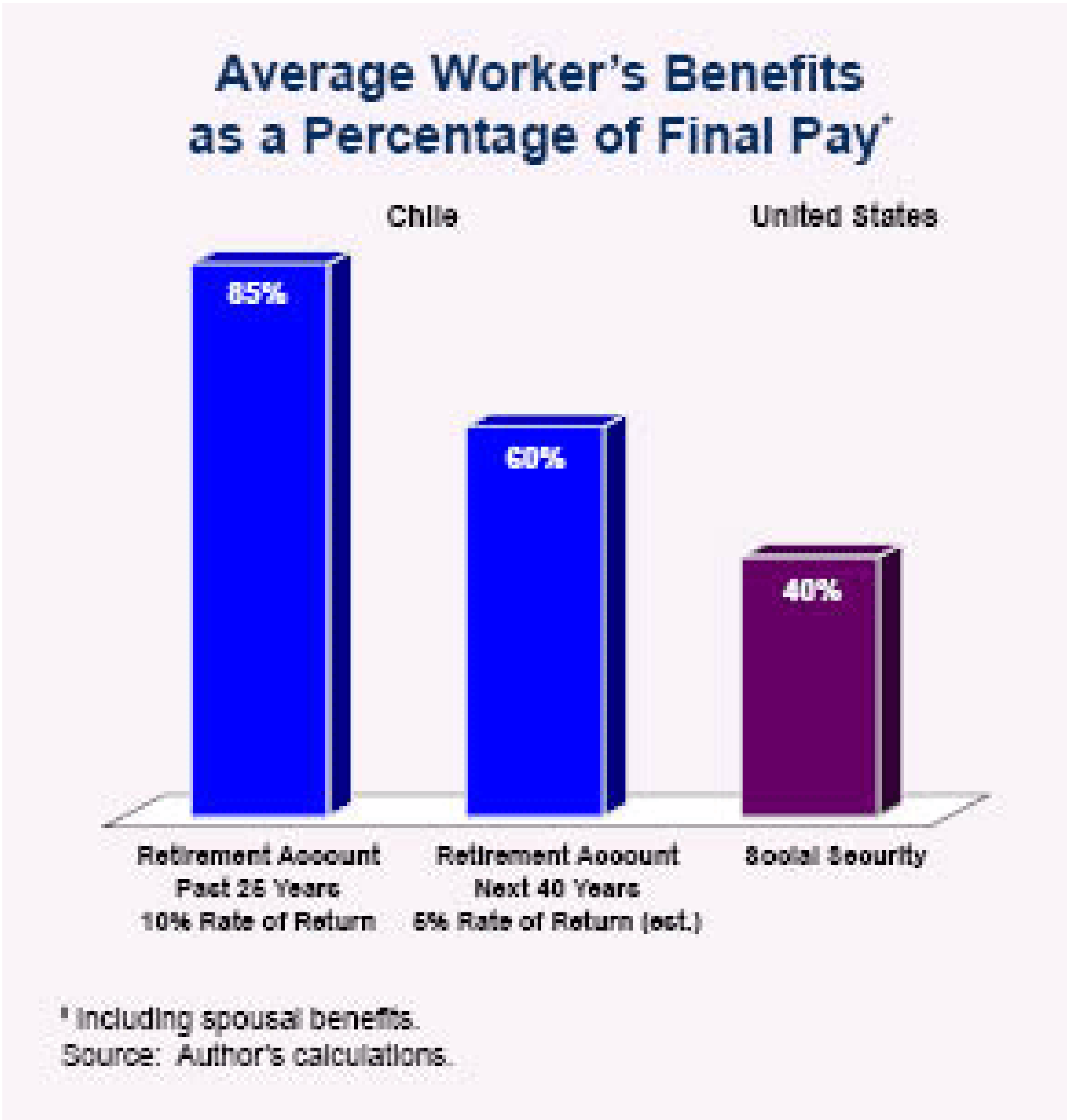
6.1 United States

According to the American Academy of Actuaries, the last major changes to the U.S. Social Security program were in 1983. By raising taxes and reducing certain benefits at that time, the program was intended to be able to pay out promised benefits for at least 75 years into the future (American Academy of Actuaries, 2011). However, demographic and economic assumptions were not exactly as expected (as they seldom will be), so Social Security funds were thrown out of balance. An automatic adjustment mechanism could be put into place, but annual or periodic changes would have to be made to maintain the system's ability to pay current benefits from current income. ABM in Sweden is one example of such a mechanism.

Automatic balancing, however, has both pros and cons for the United States. Taxes, benefits, retirement age, or some combination of the three, would have to be changed in order to maintain balance. Tax increases would have little effect on retirees, but current workers could be hurt by increased tax rates from their paychecks. Benefit adjustments would in contrast put the largest burden on retirees. Their purchasing power would be reduced, and retirees with little savings may have trouble meeting basic needs. Raising the normal retirement age would cause hardships for the elderly who have decreased working capacity. It will be difficult for elderly individuals to perform manual labor, and often employers would choose younger workers to perform the same tasks at a lower cost. Each of these actions, however, would help the Social Security system become balanced.

As mentioned above in referring to a study of OECD country replacement rates, the replacement rate in the U.S. ranks low among its competitors. Thus, one improvement that could be made in the U.S. system is to increase the replacement rate. Below is a figure comparing U.S. worker's benefits with past and expected Chile benefits. As can be seen in this chart, Chile benefits in the past, as well as expected benefits in the future, are more generous than Social Security benefits in the United States. Although the U.S. low funding rate does not tie up many resources, it brings to question the adequacy of the U.S. social security system. With use of the current social security system, simply a higher tax could render greater benefits. This is likely to face serious opposition in the public, as people are not typically supportive of giving up more of their earned income.

Figure 6-1: Average Worker's Benefits as a Percentage of Final Pay



Source: James, E. (2007, March 19). Pension Reform in Chile: Closing the Gap, Not Scrapping the System. *National Center for Policy Analysis.* Retrieved from http://www.ncpa.org/pub/ba583

A flat pension similar to the Australian system is another possibility that would help equalize benefits across the United States population. However, citizens are likely to meet this idea with resistance. Individuals who previously thought about earning benefits from the wages they earned could feel it was unjust to give equal amounts to other citizens with a different employment history. Instead, a component of a defined contribution system could be put into place so that current workers define at least part of their own future benefit. Notional defined contribution would likely work better for the U.S. than defined contribution with individual physical accounts, because the administrative expenses could be lower in the absence of physical personal accounts. Payment for current benefits or those in the near future, however, need to be funded from current taxation. This would result in current workers paying a double amount into the social security fund, and possibly receiving a conservative benefit as well.

6.2 Australia

In Australia, the current social welfare system has the advantage of using old-age flat pensions to equalize benefits for the population. This is very different than all benefit formulas in the United States, Chile, and Sweden, where working history and salary are taken into account. Equality can be seen in either a positive or a negative light, as previously mentioned. On one hand, there is a positive benefit to helping low wage earners, but this also can influence workers to show only minimal effort at work, because they will not be highly rewarded for extra exertion.

A possible remedy to this problem can be seen from the example of a funded defined contribution system in Chile. The individual accounts in Chile help workers see how contributions to the system are going to be translated into later retirement benefits. Making this connection has been proven to increase individual savings behaviors. A similar supplemental savings option could be introduced in Australia, so that workers could set aside extra cash from paychecks when available. Citizens would then gain extra benefits on top of the flat pension. A savings option like this was actually introduced to the country a short while ago. The Superannuation Guarantee, started in 1992, mandated that employers contribute a percentage of the employee's salary into one of a number of private funds. The mandatory contribution is now 9% of employee salary (Australian Institute of Superannuation Trustees, 2012). A downside to making real individual accounts is the expense of the system. The same effect can be achieved at a more reasonable cost with notional individual accounts, as in Sweden's system, but this option does not quite achieve the same desired strong connection between personal contributions and future benefits.

6.3 Chile

The Chilean experience taught some valuable lessons in distinguishing defined contribution from defined benefit schemes. When putting defined contribution systems into place over a large population, costs can be drastically high. This problem can be solved by the use of hypothetical accounts, as previously mentioned. As AFPs already have a place in the established system of Chile, however, it is likely not feasible to replace these companies with a single regulator to keep track of individual funds. This may reduce overall administrative cost in the long run, but there is certainly time and expense that goes into switching regulatory bodies. In addition, the loss of a physical individual fund will harm the mental connection that citizens have between their benefits and contributions.

Another concern regarding the Chilean social security system are the historically prevalent labor market distortions used by employees and employers alike. This tendency has become less common with the introduction of a defined contribution benefit, but there are still individuals who take advantage of the minimum pension provided in Chile for those individuals without the means to create their own pension fund. Slight reorganization of the minimum benefit system could help solve this problem. If requirements were put into place forcing citizens to prove that they are indeed misfortunate rather than cheating the system, it would be more difficult for workers to use distortions in order to get the minimum benefit.

6.4 Sweden

The Swedish social security system of notional defined contribution solves a limited number of problems created by defined contribution systems. However, there are still multiple imperfections. The inability to predict exact contribution amounts is cause for discomfort in Swedish citizens. This can cause both staying in the workforce longer and evading properly recorded employment, based on individual's view. Mandating exact pension amount predictions would, however, interfere with the purpose of the automatic balancing mechanism in place within the country. Instead of determining an exact benefit amount at the birth of the policy, updates could be given to citizens each year of their expected benefit amount. As the balance ratio is calculated each year, the government should be able to use these results to predict how the given annual ratio will affect each individual's account. This, however, would undoubtedly be a very costly system, doing little to support the low administration costs in notional defined contribution. The notional system also provides very little incentive to start personal savings. This problem could be solved if perhaps an employer match or different motivation is offered to workers who save adequately.

Chapter 7

Conclusion

Inspection of defined benefit and defined contribution social security systems around the world reveals no system is a panacea for providing old age, survivor, and disability benefits. Pay-as-you-go defined benefit schemes similar to the system in the United States causes funding hardships for the government, particularly in the face of dramatic demographic changes. A flat pension welfare system, illustrated in Australia, equalizes population benefits but also discourages proper saving and encourages labor market distortions. Chile's example of funded defined contribution shows that the system encourages personal savings and results in high benefit returns, but transition to this system and maintenance of the system is very expensive. Conversely, notional defined contribution in Sweden eases transition costs. An automatic balancing mechanism, however, prevents individuals from predicting what their exact retirement benefit will be in the future.

The previous observations suggest that each of these four pension systems could be improved by taking certain actions. Possible actions unfortunately have pros and cons for different population groups when implemented in different countries. Improvement suggestions for each country must be individual and based on the country's past experience. It will be interesting to see the development of some relatively new or reforming pension systems across the world.

Extensions of this study could involve an in depth look at the populations in each country and make an attempt to model the different program solutions. Even complicated programs would have to limit the variables considered in these models, and various outcomes should be considered to see multiple possible results. Those suggestions are beyond the scope of this study.

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