"IMPACTS ON ECONOMIC SECURITY PROGRAMS OF RAPIDLY SHIFTING DEMOGRAPHICS"

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Abstract

Canada and the United States are facing rapidly shifting demographic profiles as their respective Baby-Boom generations move from the labor force into retirement. This paper explores the impacts this shift will have on a broad range of Economic Security Programs, including: Social Security; Employer-Sponsored Pension and Group Benefit Plans; and Individual Savings Plans, both tax-advantaged and otherwise.

The paper first outlines the magnitude of the demographic shifts that are taking place, and gives a careful definition of population aging.

The paper concludes by noting some concerns that practitioners in any of the areas of the provision of economic security should have in the face of these rapid shifts.

"Impactos en la Seguridad Económica. Programas de Cambio Demográfico."

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Canada

Resumen

Este artículo analiza con cierto detalle posibles trastornos a los programas de seguridad económica – de origen gubernamental, patronal e individual – causados por el envejecimiento de la generación del "baby boom". El documento comienza definiendo qué se entiende por "población en envejecimiento" y concluye que los cambios en la fertilidad son más importantes que los cambios en la esperanza de vida. También se argumenta que la denominación "baby boom de la posguerra" es inexacta y puede llevar a errores de planeación en el desarrollo de productos y su mercadotecnia. Finalmente, esta sección del artículo muestra que el segmento de la población de más rápido crecimiento será el más anciano – aquellos de edades 85 en adelante, quienes también representarán el mayor gasto en la provisión de servicios de salud y pensiones de retiro. El artículo se enfoca entonces a otros cambios demográficos de importancia, en particular las tasas de participación laboral femenina. Se analiza el impacto de los cambios demográficos en cada proveedor de programas de seguridad económica: gobierno (salud y seguridad social); patrones (planes de pensiones y beneficios); y los individuos. Puntos preocupantes y oportunidades de contrarrestar sus efectos en la industria aseguradora son comentados. Finalmente, el artículo investiga si seremos capaces de financiar el temprano retiro de la generación "baby boom". Se concluye que será financiable si podemos convencer a una porción de la fuerza laboral a mantenerse activa por más tiempo y si tenemos tasas de crecimiento productivo sanas. Los problemas de envejecimiento de la población pueden ser vistos como oportunidades para aquellos que tengan el "mapa" adecuado.

I Introduction

Canada and the United States are facing rapidly shifting demographic profiles as their respective Baby-Boom generations move from the labor force into retirement. This paper explores the impacts this shift will have on a broad range of Economic Security Programs, including: Social Security; Employer-Sponsored Pension and Group Benefit Plans; and Individual Savings Plans, both tax-advantaged and otherwise.

The paper first outlines the magnitude of the demographic shifts that are taking place, and gives a careful definition of population aging.

The paper concludes by noting some concerns that practitioners in any of the areas of the provision of economic security should have in the face of these rapid shifts.

II Population Aging

This section of the paper explores the definition of the phrase "Population Aging". There are two components of Population Aging: enhanced life expectancy and shifting demographics.

It is well known that life expectancy in both Canada and the United States has improved remarkably this century as evidenced in the following two tables.

Table 1

Life Expectancy in Canada

1931 to 1991

Year	At Birth		At Age 65		At Age 75	
	Male	Female	Male	Female	Male	Female
1931	60.0	62.1	13.0	13.7	7.6	8.0
1951	66.3	70.8	13.3	15.0	7.9	8.8
1971	69.3	76.4	13.7	17.5	8.5	10.7
1991	74.6	80.9	15.7	19.9	9.6	12.5

Source: Statistics Canada, National Life Tables

Table 2

Life Expectancy in the United States

1930 to 1990

Year	At Birth		At Age 65	
	Male	Female	Male	Female
1930	59.8	61.1	11.7	12.8
1950	65.5	71.0	12.7	15.0
1970	67.1	74.7	13.0	16.7
1990	71.8	78.8	15.1	18.9

Source: United States, Bureau of the Census, National Life Tables

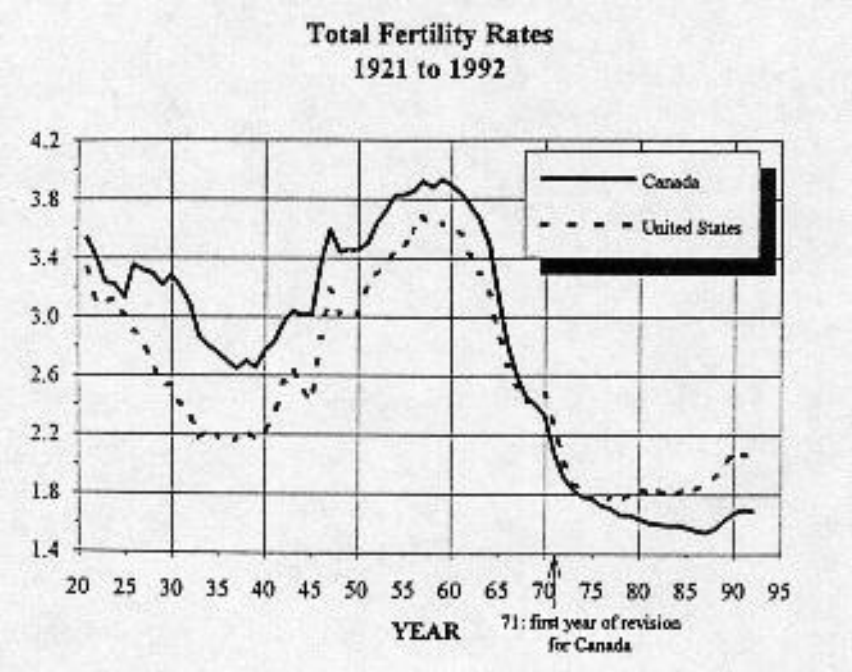
Opinions vary as to why life expectancy has improved so much. However the literature seems to be in general agreement that the leading reasons for improvement this century include: nutrition, child spacing/family size, housing, and public sanitation (Hertzman et al, 1994, p70). This is not to say that medical care has been ineffective. Quite clearly, data indicate the effects of improvements in medical therapy and public health on certain diseases. But there are serious limits to the effects of medical intervention on population life expectancy. Major shifts in the health status of whole populations over time do not necessarily depend upon the implementation of public health or medical control measures against specific diseases. They point instead to a profound linkage between health and the social environment, including the levels and distribution of prosperity in a society (*ibid,* p71).

Clearly, all else being equal, if every member of society lives longer, then the population will age. Thus, enhanced life expectancy is an important part of the population aging paradigm, but not the most important part.

What is more important, it turns out, is the dramatic demographic shifts that took place in both Canada and the United States in the second half of this century.

Both Canada and the United States experienced large increases in live births after World War II. This has become known as the Post-War Baby-Boom. One view of this phenomenon is provided by Figure 1 which shows the Fertility Rates for Canada and the United States for the period from 1921 to 1992.

Figure 1



Source: Brown, 1997, p30

This graph provides a great deal of information.

First, had one been asked in the late 1930's to predict the fertility rates of the 1990's, one would probably have been able to provide a relatively accurate prediction. That is, the low fertility rates of the 1990's are not the anomaly. Rather, it was the fertility rates of the 1940's and 1950's that are out of place. (As an aside, it is interesting how low the fertility rate was in the 1930's, before the advent of modern birth control devices such as the pill. Thus, it may be difficult to use "the pill" as the major explanation of the drop in fertility rates in the 1960's and 1970's).

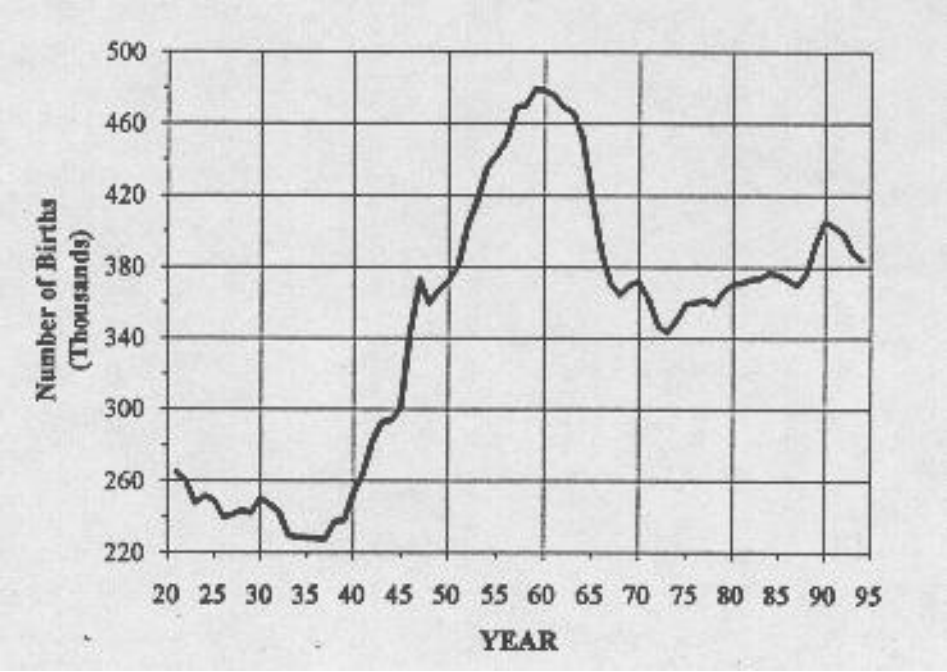
Second, Canada had a more interesting and dramatic demographic shift than did the United States. Canada's Baby-Boom/Baby-Bust Tidal Wave was higher in its peak and lower in its trough than the wave experienced in the United States. Thus, in the paper that follows some emphasis is given to the Canadian context since problems in Canada should tend to be more severe than in the United States (and also because the author has a stronger familiarity with the Canadian environment).

Third, it may be inappropriate to call this phenomenon the Post-War Baby-Boom. If one studies Figure 1, one can see that the immediate effect of the return of the soldiers from the war is obvious, but temporary. It is the view of this author that the real Baby-Boom did not start until the early 1950's. This would then require a new explanation of the Baby-Boom (i.e. it was not caused by the return of the war participants).

The explanation is very much based in economics and can be found in the writings of Easterlin (e.g. 1980). The depression cohort was small and had experienced little in the way of material rewards. When they entered the workforce in the 1950's, jobs and promotions were relatively easy to come by. That, combined with the low material expectation of the depression cohort, meant that they were able to meet their material needs while having one spouse at home full-time. This also meant that they were able to have extra children. By the same token, the economic cost of a stay-at-home spouse in the 1960's and 1970's combined with the much higher material expectation of the Baby-Boom generation can be used to explain the decline in live births in the late 1960's and 1970's (see Ermisch, 1983). Ermisch's analysis indicated that the higher a woman's earning power, the longer the gap between marriage and first birth. He also points out that the increased probability of divorce may keep the fertility rate down.

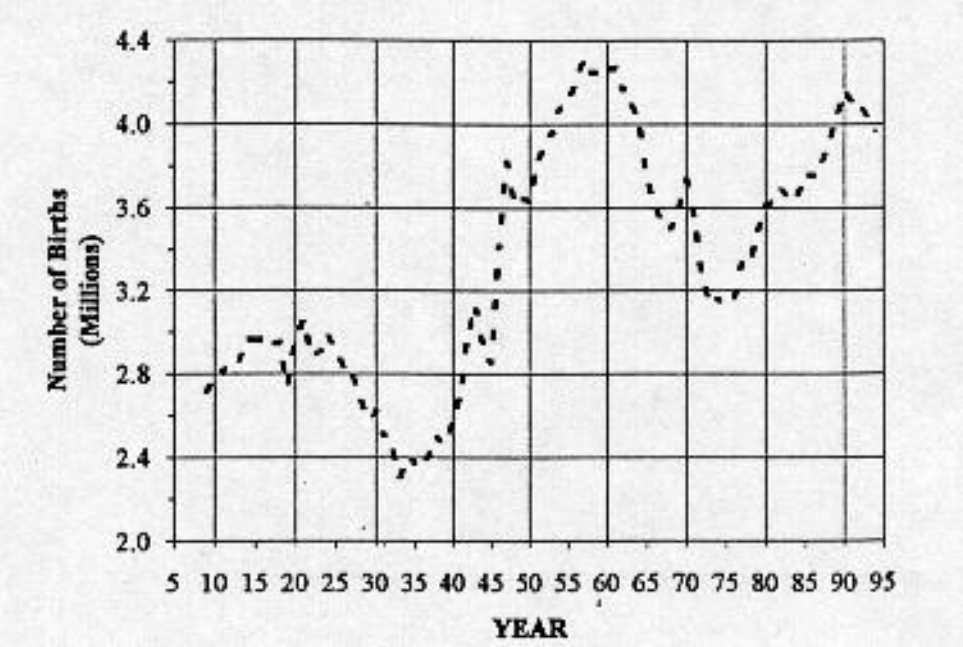
Another representation of the same phenomenon can be found in the next two graphs which present Live Births for each of Canada and the United States in this century.

Figure 2
Live Births in Canada



Source: Brown, 1997, p225

Figure 3
Live Births in the United States



Source: Brown, 1997, p224

Once again, one can see that the Baby-Boom did not really reach its full force until the good economic times of the 1950's. In fact, live births peaked in the United States in 1957, and in Canada in 1959. Thus, as this paper is being presented in 2000, the largest birth cohort ever is turning age 43 in the United States, and age 41 in Canada—not age 55 as one might assume using the indicator—'Post-War Baby-Boom'.

Second, one can confirm that the Baby-Boom peak over the Depression-cohort trough is larger in Canada (more than two-to-one) than in the United States (less than two-to-one).

In reality, the Baby-Boom is made up of two very different cohorts. These will be described as the Senior Boomers or Wave Surfers, those born in the period 1945 to 1955, and the Junior Boomers, those born from 1956 to 1966.

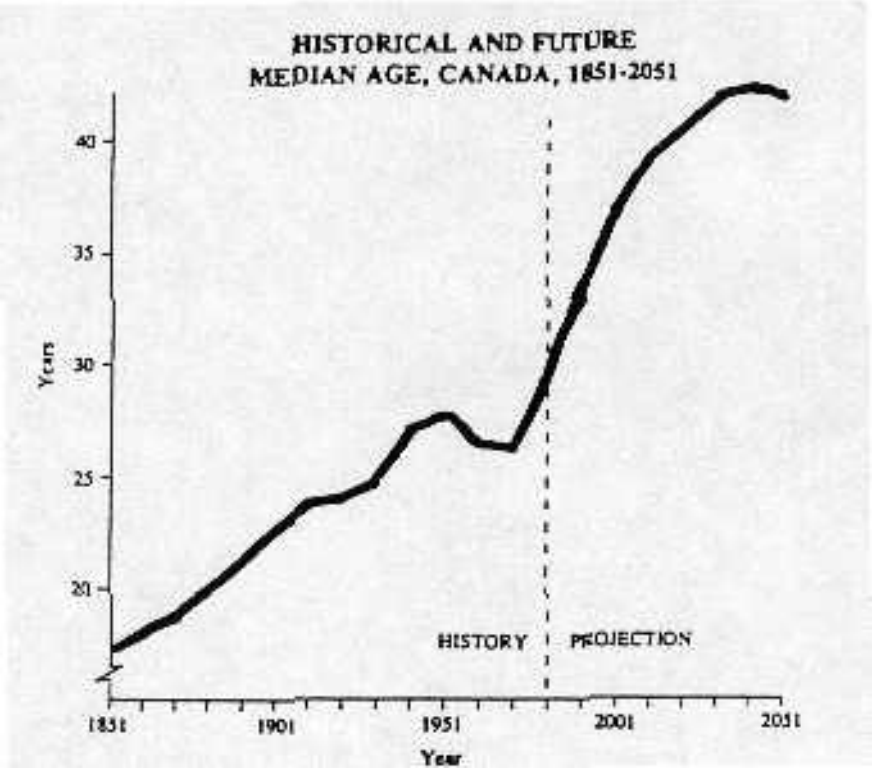
The Wave Surfers got into the job market when jobs were still available. They bought houses when they were still relatively cheap, and borrowed mortgage money when rates were still low. More importantly, they entered corporations where their superiors were from the extremely small depression cohort. This made progression through the ranks relatively easy. By age 30 the Senior Boom cohort was earning one-third more than their fathers (Levy and Michel, 1985, p40).

The Junior Boomers, however, entered the labor force when youth unemployment was high (25 percent in Canada), bought houses when the prices had already jumped, and backed their purchases with mortgages at rates that were all-time highs (over 20 percent per annum in 1983/84 in Canada). They also entered corporations where the ranks just above them were jammed by the Senior Boomers. For them, promotion was and is painfully slow. By age 30, the Junior Boomers were earning 10 percent less than their fathers (*ibid*).

Thus, as stated, the Baby-Boom in total is not a homogeneous entity. At the very least, there are two radically different demographic subsets.

We have now achieved a good understanding of just what we mean by population aging. An overall graphic image of population aging is captured nicely in Figure 4 that follows.

Figure 4



Source: Foot, 1982, p125

The graph for the United States would be very similar.

One can see in this graph the rapid escalation of the median age (whereby 50 percent of the population is older and 50 percent of the population is younger). From median age 17 in the middle of the last century, we are now at median age 30, and we expect to achieve a median age of around 42 by the middle of the next century. While enhanced life expectancy is an important part of this phenomenon, shifting demographics are the true driving force.

For evidence of this, notice that the only time the median age in Canada has ever fallen was in the period from around 1952 to 1966, which corresponds to the Baby-Boom years as defined in this paper. Since 1966, the median age of the population has been driven very much by the Baby-Boom generation.

Other indications exist. For example, in projecting future contribution rates required for the Quebec Pension Plan, Menard (1992, p267) indicated that enhanced life expectancy would cause the contribution rate of 2040 to rise 1.3 percentage points over 1990, while other demographic factors (lower birth rates offset slightly by immigration) would cause the Quebec Pension Plan contribution rate of 2040 to rise 7.7 percentage points over 1990. Similarly, Denton et al (1998, p107) found that the impact of low versus high fertility on median ages in Canada was 12.5 years by 2041, while the impact of low versus high mortality was only 1.6 years.

In conclusion, population aging has a lot more to do with shifting demographics than with improvement in life expectancy. However, enhanced life expectancy is an important element of both the problems and the possible solutions that need to be considered in the future design of economic security programs.

It is interesting to place these demographics shifts that have taken place in Canada and the United States in an international perspective.

Most nations have experienced remarkable improvements in Life Expectancy over the last half-century, especially those who are just attaining modern medical practice (e.g. China). This is indicated clearly in Figures 5 and 6 that follow (data from Chris Daykin, UK Government Actuary).

These same countries have seen significant drops in their fertility rates (at least since the mid 60's) as seen in Figure 7 (*ibid*).

Finally, as presented in Figure 8 (*ibid*), the result of enhanced life expectancy combined with dropping Fertility Rates, is an expected sharp rise in Dependency Ratios (defined here as the ratio of those aged 65 and over to those aged 15 to 64).

Returning our focus to Canada and the United States, graphical evidence of this macro-population aging process can be seen in the graphs that follow.

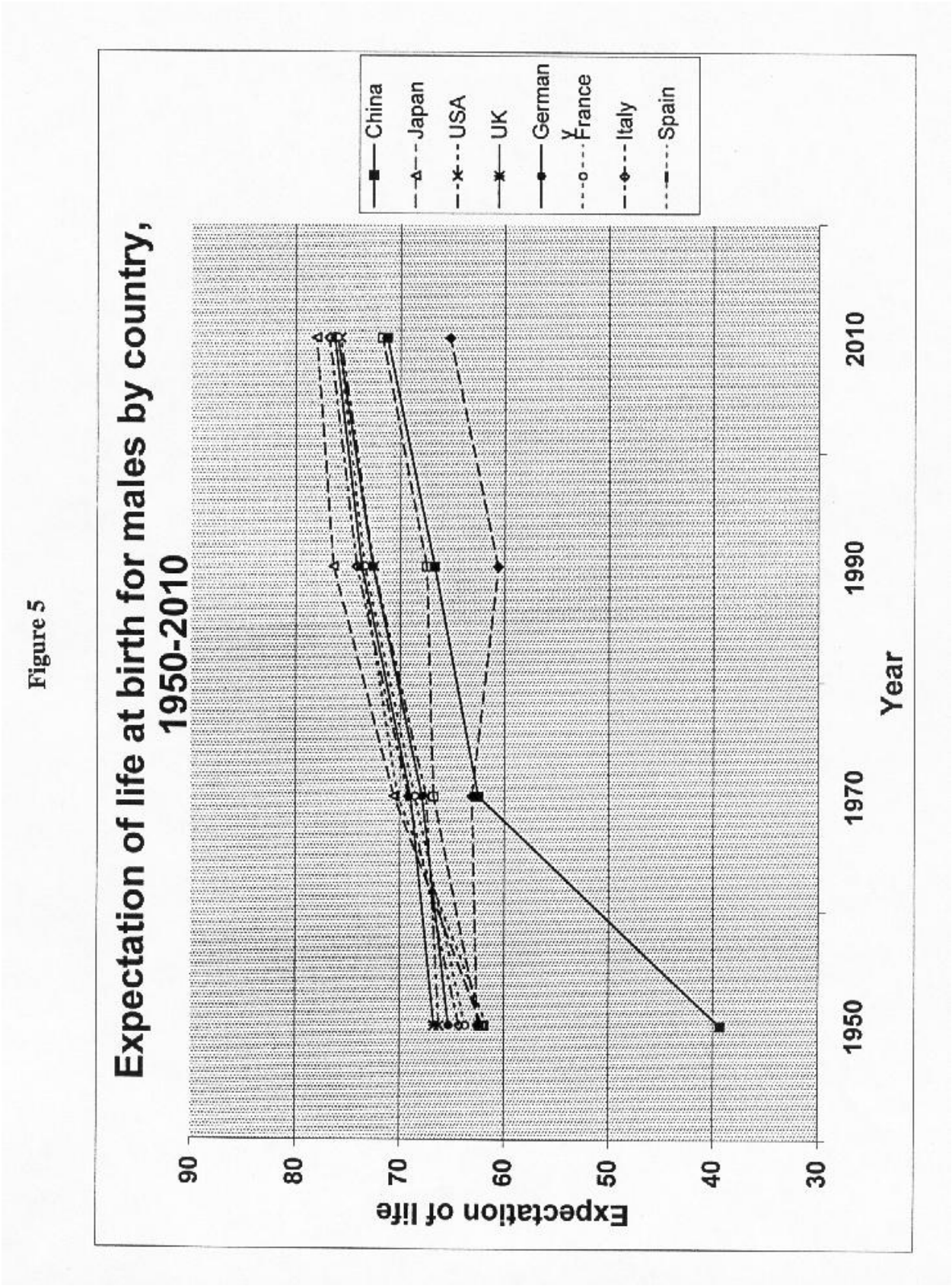

Expectation of life at birth for males by country, 1950-2010
China
Japan
USA
UK
German y
France
Italy
Spain
Expectation of life
90
80
70
60
50
40
30
1950
1970
1990
2010
Year

Figure 5

Figure 6

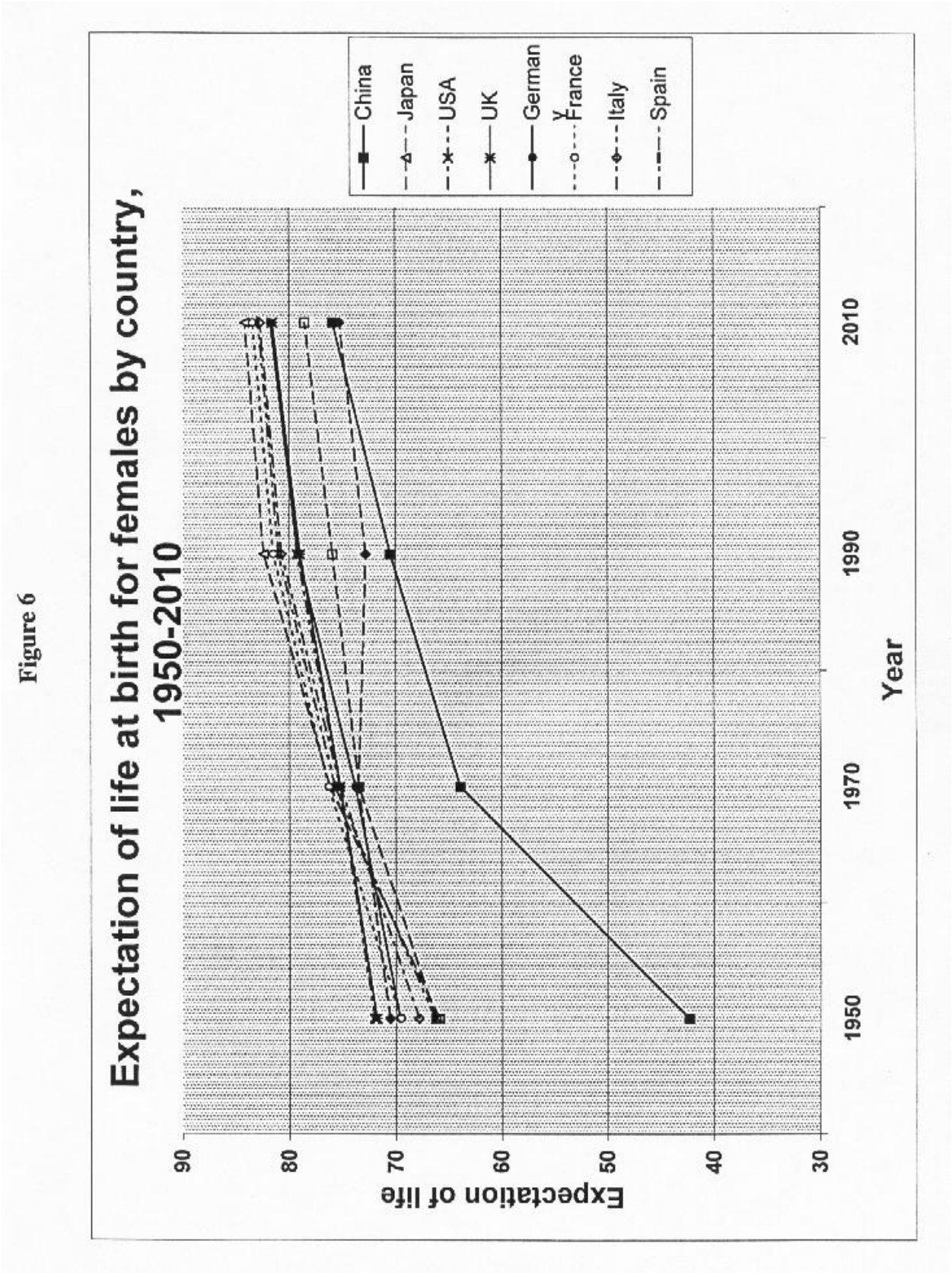

Expectation of life at birth for females by country, 1950-2010
China
Japan
USA
UK
German y
France
Italy
Spain
Expectation of life
90
80
70
60
50
40
30
1950
1970
1990
2010
Year

Figure 7

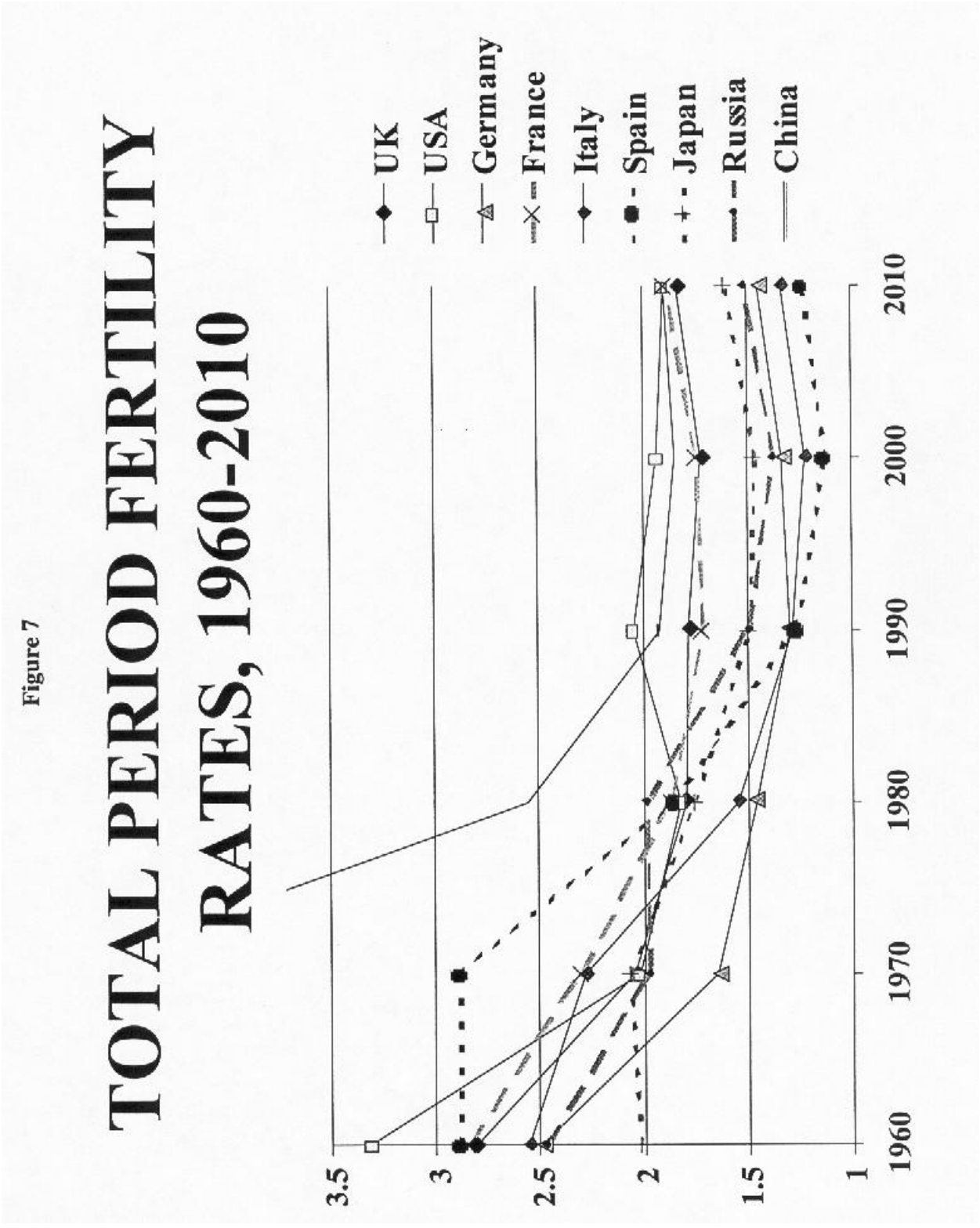

TOTAL PERIOD FERTILITY RATES, 1960-2010
UK
USA
Germany
France
Italy
Spain
Japan
Russia
China
3.5
3
2.5
2
1.5
1
1960
1970
1980
1990
2000
2010

Figure 8

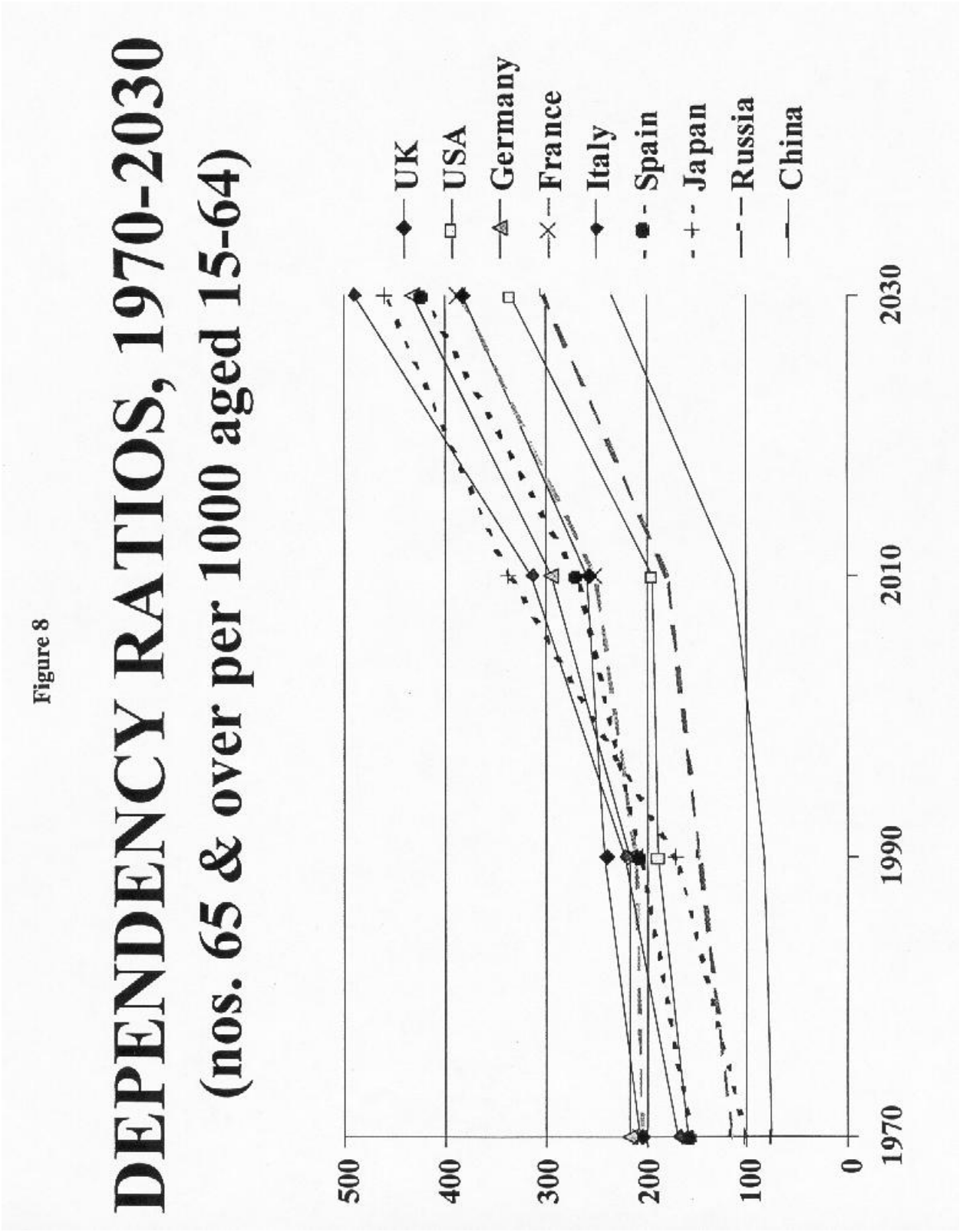
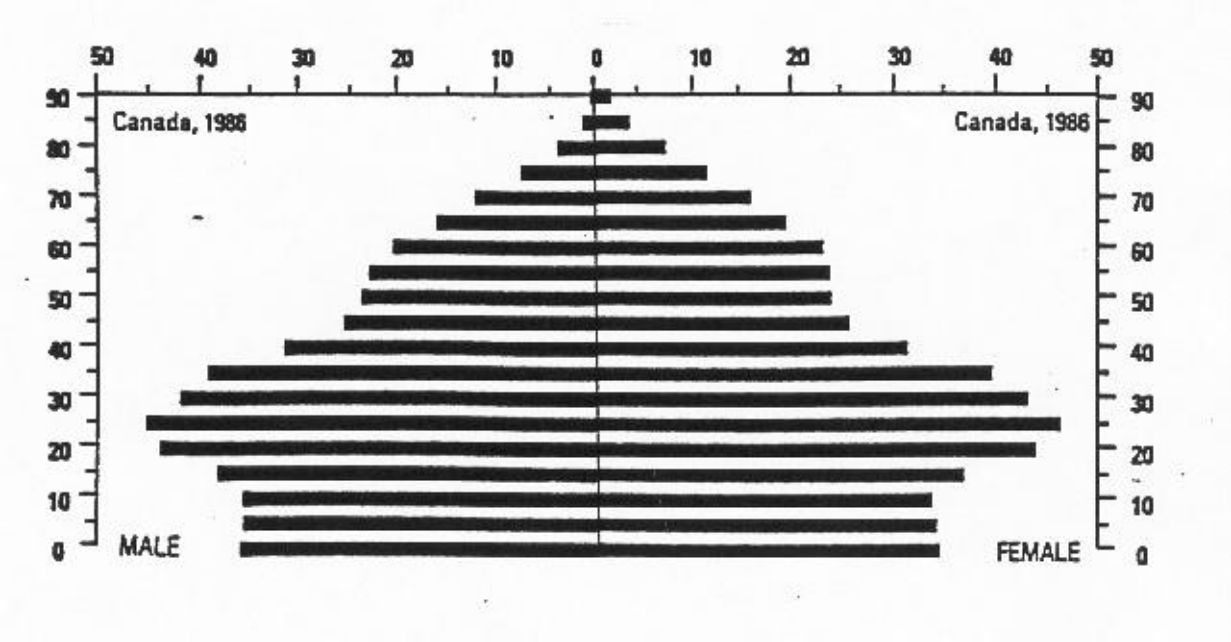

DEPENDENCY RATIOS, 1970-2030
(nos. 65 & over per 1000 aged 15-64)
500
400
300
200
100
0
1970
1990
2010
2030
UK
USA
Germany
France
Italy
Spain
Japan
Russia
China

Figure 9

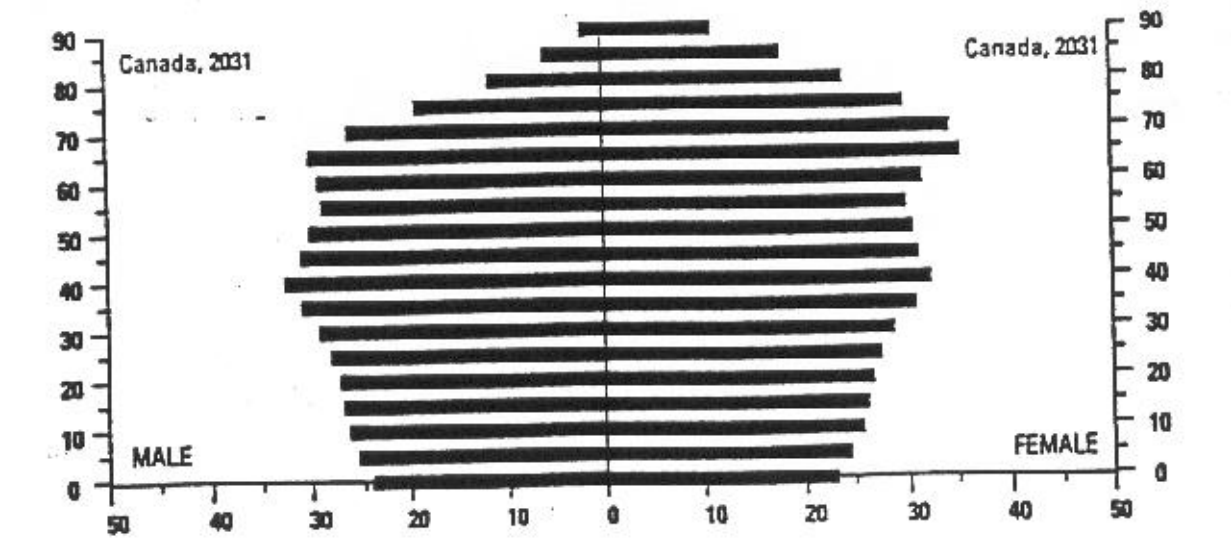
Canadian Population 1986



Source: Statistics Canada

Figure 10

Canadian Population 2031



Source: Statistics Canada

Figure 11
United States Population, 1995

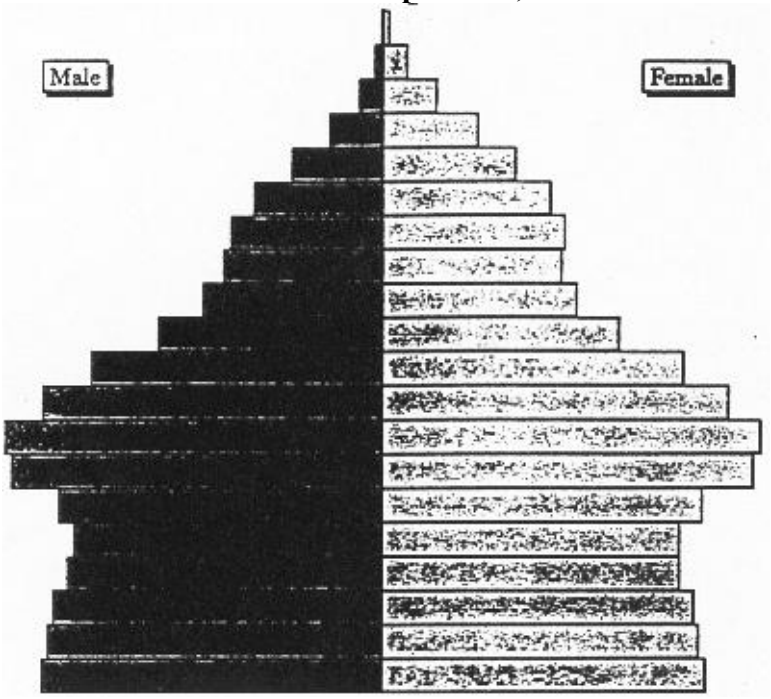
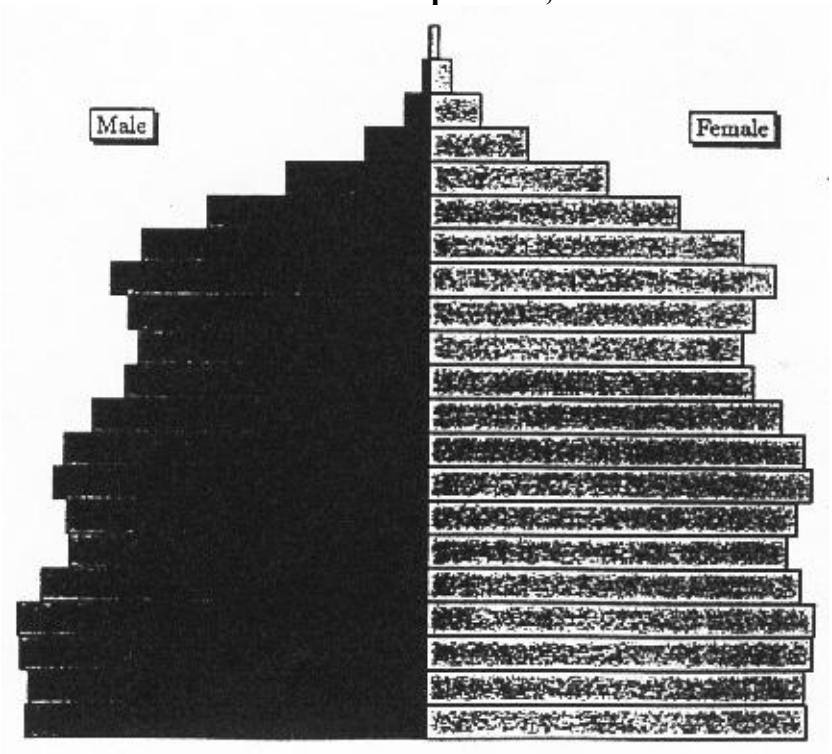


Figure 12
United States Population, 2030



These graphs are known as population pyramids and show the number of people within each age group, females on the right and males on the left. In a stable population (one in which birth rates and death rates are constant year after year) these histograms would look like a pyramid—broad in the base and then, because of mortality, working gradually to a peak at the top. These are not the shapes presented in Figures 9 to 11.

Clearly, both Canada and the United States are going through some rapid demographic changes. This is dramatically summarized for Canada in Table 3 which follows. Similar data could be presented for the United States.

Table 3

Distribution of Canadian Population by Age-Group
1956 to 2036

Age	1956	1976	1996	2016	2036
Under 20	39.4	35.6	26.7	22.0	20.2
20-64	52.9	55.8	61.1	61.4	55.0
65+	7.7	8.6	12.2	16.6	24.8
75+	2.5	3.2	5.1	7.1	12.8
85+	0.4	0.7	1.2	2.2	3.8

Source: Denton, Feaver, and Spencer, 1998, p85/90

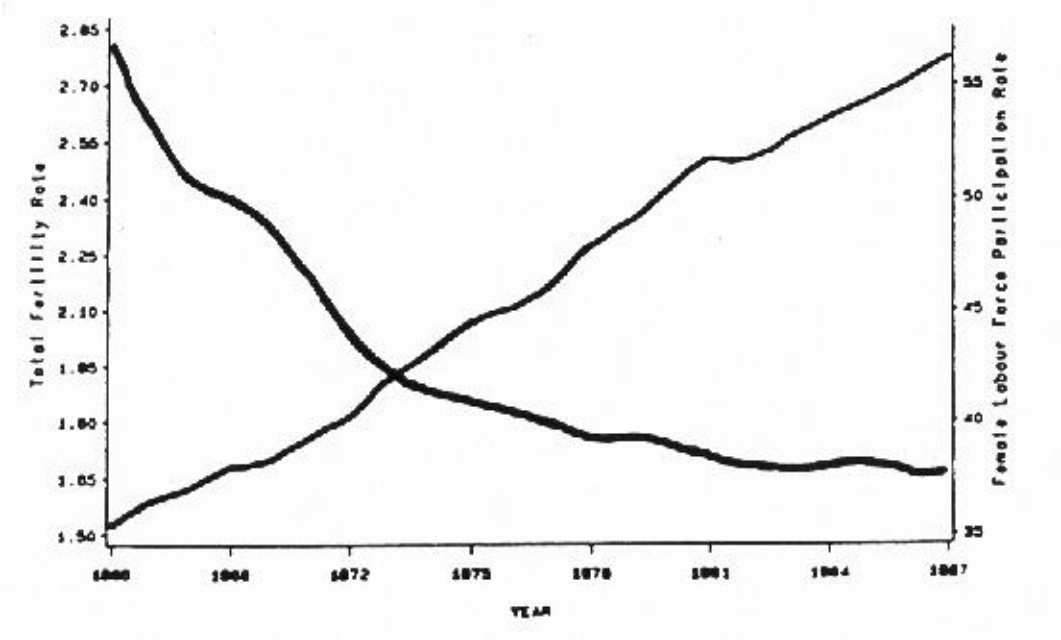
Thus, over the next forty years, the percent of the population aged 65 and over will double, while the percent of the population aged 85 and over will more than triple. This has important implications for economic security programs as discussed later.

III Other Demographic Shifts

Another important demographic shift that has taken place in both the United States and Canada in the last thirty years is presented in Figure 13.

Figure 13

Fertility Rates
Versus
Female Labor Force Participation Rates
1966-1987



Source: Brown, 1991, p17

As indicated in Figure 13, over half of the female population of working age is now actively in the labor force. Figure 13 interestingly juxtaposes the rise in female labor force participation with the fall in fertility rates. It is highly debated as to which is the cause and which is the effect, but, on a purely economic basis, it is clear that, as discussed earlier, the 'cost' of staying home to raise children has risen, and that a return to the fertility rates of the 1950's is unlikely (Ermisch, 1983).

Regardless of the cause versus the effect, women now often represent independent economic units. The most common head of a single-parent family is female. In many instances, this woman is university educated and earning an above-average wage. In many instances, the business person deciding the design features of a company's group-benefit scheme will be female.

These are demographic facts of which the insurance industry must be cognizant. Products must be designed for a workplace that is increasingly female. Individual products must be tailored more often to a female purchaser and insured. Group benefits must be flexible enough to handle both the single-female household and the two-income family. There is little value in benefits that only duplicate those already available to the spouse under another plan. Thus a continued rise in employee demand for flexible benefit plans (e.g. cafeteria plans) that allow for a multiplicity of living arrangements can be expected.

Further, it is the author's contention that companies who employ females in the design and marketing of economic security schemes will be more successful in this new demographic environment.

IV Impacts of Shifting Demographics on Economic Security Programs

1. The Government as Sponsor

Historically, government-sponsored economic security systems, including health care and social security, have been financed on a pay-as-you-go basis. That is, the costs of the plan in any particular year are paid for by contributions or taxes in that year. No (or very small) reserves are accumulated, and workers cannot be said to be paying for **their** future benefits (rather they pay for the benefits of today's recipients).

This system of financing works well, and worked well in the 1950's and 1960's, so long as the tax base or contribution base is growing faster than the cost of benefits. Thus, in the period when the labor force was growing rapidly, along with real wages, pay-as-you-go financing was wise. However, pay-as-you-go financing opens itself up to justifiable criticism when the costs of the benefits for the scheme are growing faster than the tax base or contributions base. That is the case today, and for the foreseeable future.

Because of the demographic shifts, and the slow rate of growth of real incomes, many workers today do not believe that their social security systems are a good deal. That is, they do not believe that they will get their money's worth by continuing to contribute to social security.

Much analysis has been done on this issue, and the facts for Canada and the United States appear in the tables that follow.

Table 4

OASDI (U.S.)
RATIO OF BENEFITS TO ACCUMULATED TAXES
(at 2% Real)

Retirement	WORKER AT AIW			MAX-WAGE EARNER		
Year	Single Male	Single Female	Couple	Single Male	Single Female	Couple
1960	7.1	8.9	13.2	5.7	7.1	10.5
1980	2.8	3.5	5.2	2.5	3.2	4.7
2000	1.2	1.6	2.3	1.0	1.2	1.8
2020	1.1	1.4	2.1	0.8	1.0	1.4

Source: Myers and Schobel, 1992, p263/280

Analysis by the Canada Pension Plan actuary arrives at similar findings, but in a different presentation format.

Table 5

CANADA PENSION PLAN
MONEY'S WORTH ANALYSIS

Year of Birth	Ratio of Benefits to Contributions	Internal Rate of Return (%)
1911	47.7	31.3
1929	28.1	16.6
1948	11.7	9.0
1968	6.6	6.4
1988	5.4	5.2
2012	5.4	5.1

Source: Canada Pension Plan, 15th Actuarial Report, as at December, 1993, p101.

As an aside, the 5.1 percent rate of return presented in the Canada Pension Plan for the cohort born in 2012 assumes an inflation rate of 3.5 percent per annum. Thus, the net real rate of return for this birth cohort is 1.5 percent per annum.

Clearly, these dropping rates of return to successive birth cohorts can be traced back to the rapidly shifting ratios of retirees to workers (see Figures 9 to 11), and the slow rate of growth of real wages over the past decade. Raising contributions (taxes) or lowering benefits will not change these disappointing trends.

Faced with these demographic trends, the governments of both Canada and the United States have been studying a partial privatization of social security as a possible solution to the projected

lower rates of return. In the United States, two of the three major proposed reforms of the OASDI system would see part of the social security system allocated to the equivalent of Individual Accounts, with the participant investing the funds in the private market. In Canada, contributions to the Canada/Quebec Pension Plans have been raised above the pay-as-you-go rate to create an investment fund that will be invested in the private sector. The argument presented is that social security systems, and their participants, can earn a higher rate of return if some of the social security funds are invested in the stock market or in high-yield private sector assets rather than low-yield government bonds as is the case today. While this is an appealing argument, that has wide and growing acceptance, actuaries who work regularly with the financing of social security systems are questioning its long-term validity.

Francisco Bayo (1988, p178), Deputy Chief Actuary of OASDI, has stated:

> For Social Security, you cannot accumulate assets; that is, claims from somebody else's production. If we have a large amount of money in the Social Security trust funds, we have a claim on ourselves, which does not have much meaning. The truth is, whatever is going to be consumed—be it a product that you can get a physical hold of, or services that are very difficult to hold—those products cannot be stockpiled. They have to be provided at the time of consumption. No matter what kind of financing we are going to have in our Social Security program, you will find that the benefits that will be obtained by the beneficiary in the year 2050 will have to be produced by the workers in the year 2050, or just a few years earlier.

Nicholas Barr (1993, p220) says it even more strongly:

> The widely held (but false) view that funded schemes are inherently 'safer' than PAYGO is an example of the fallacy of composition. For individuals the economic function of a pension scheme is to transfer consumption over time. But (ruling out the case where current output is stored in holes in people's gardens) this is not possible for society as a whole; the consumption of pensioners as a group is produced by the next generation of workers. From an aggregate viewpoint, the economic function of pension schemes is to divide total production between workers and pensioners, i.e. to reduce the consumption of workers so that sufficient output remains for pensioners. Once this point is understood it becomes clear why PAYGO and funded schemes, which are both simply ways of dividing output between workers and pensioners, should not fare very differently in the face of demographic change.

In general, one should expect governments to continue to be concerned about the overall cost of social security, and the intergenerational equity that the existing systems provide. One should expect further attempts to cut benefits and privatize a least part of the existing system.

Not only do governments have to worry about the future financing of social security because of the shifting demographics, but, at the very same moment, they will be faced with rapidly rising costs for health care.

This can be seen clearly in the following table.

Table 6

Growth of Public Social Expenditures in the OECD
1980 to 2040
(1980 = 100)

Country	Health Care	Social Security	Overall*
Australia	240	288	207
Britain	121	130	110
Canada	218	304	187
France	119	172	128
Germany	90	126	97
Italy	108	134	107
Japan	146	229	140
Sweden	117	123	109
United States	178	215	165

*Includes all social expenditures (e.g. education, unemployment)
Source: Walker, 1990, p384

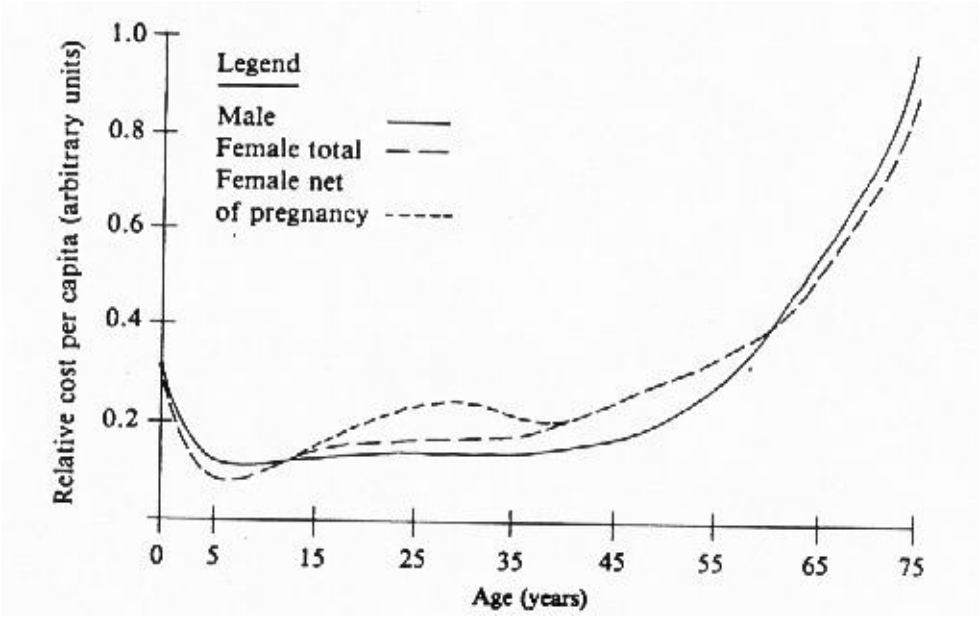
One can see that the countries which truly experienced the Baby-Boom/Baby-Bust are leaders in the growth of public social expenditures (e.g. Australia, Canada and the United States). Further, many European countries already have 'aged' populations and face smaller growth rates for public social expenditures (e.g. Britain, Sweden, Germany and Italy).

The increase in public expenditures captured in Table 6 are those created purely by population aging. The projections assume a constant level of service and benefit delivery, with no improvement in the existing systems.

Age is one of the strongest determinants in predicting the need for health care services of a nation as can be seen in Figure 14 that follows. In Canada, people aged 65 and over made up 11.7 percent of the population in 1991/92, and 4.75 percent of the population were 75 and over. However, those 65 and over accounted for nearly 60 percent of hospital inpatient days, and 40 percent of all days were provided to those 75 and over (Barer et al., 1995, p201).

Figure 14

Relative Per Capita Costs of Health Care
For
Males and Females by Age



Source: Marshall, 1987

Thus, the aging of the population will continue to exert upward pressure on any government–sponsored health care benefits. In response, one should expect the government to continue to find ways to off load their costs to the private sector.

In the United States, one would expect a continuation of the expansion of state-mandated benefits to be covered by employer plans and further pressure for employers to provide post-retirement coverage. Finally, one might also anticipate a rise in the age of eligibility for Medicare from its present age 65 (e.g. to rise with the OASDI normal retirement age).

In Canada, one should expect to see the provincial governments continue to decrease the benefits covered where permissible (e.g. out-of-country coverage) and to continue to de-list procedures that are not medically necessary (e.g. physician check-ups to comply with insurance applications). One should also expect the government to move more to capitation payment for doctors (if not outright salaries) and to provision of prescription drugs only through government recognized formularies.

These moves will put more pressure on employer-sponsored and/or individual health care benefit schemes to provide the benefits de-listed by the government.

2. Employer-sponsored Economic Security Programs

--Pension Plans

The aging population will put pressure on employer-sponsored pension plans in a variety of interesting ways. Many of the accepted norms of today may be reversed in the next forty years.

First, over the past two decades, there has been a consistent shift in plan design away from Defined Benefit (D.B.) plans to Defined Contribution (D.C.) plans. There have been a number of important reasons for this including: the high administrative costs of D.B. plans; the more mobile work force; high real rates of interest and strong investment rates of return; the desire of employers to have fixed costs for their pension plans.

As the population ages, and the workforce ages with it, older employees may return to a desire for the security of one's standard of living that only a Defined Benefit plan can provide. Younger workers, especially those who are highly mobile, are clearly better off to place their dollars into Defined Contribution plans, especially when investments are returning such stellar rates. However, the retirement benefit in a Defined Contribution plan cannot be known until it is turned into a retirement annuity. Even when one is very close to retirement, rates of interest upon which annuities are priced can change so rapidly that one's retirement income may still not be assured. Older workers may prefer the security provided by a Defined Benefit plan, even if it turns out that the actual benefits are lower than what might have been achieved under a Defined Contribution plan for the same total cost.

Second, over the past forty years, ages at retirement have fallen, and fallen significantly as can be seen in Table 7.

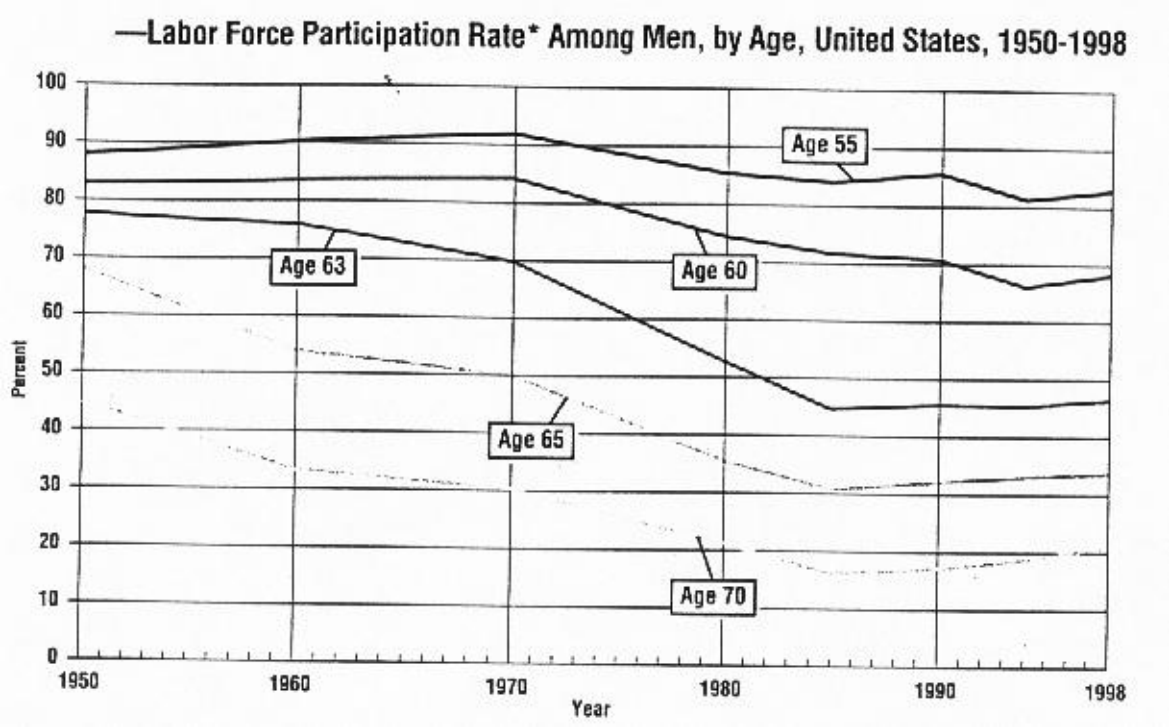
Table 7
Average Retirement Age in Selected Countries
1950-1990

Country	1950	1970	1990	1990-1950
Canada	67.3	65.0	62.3	- 5.1
U.K.	68.6	65.9	62.9	- 5.7
United States	67.9	65.3	63.9	- 4.0
Sweden	67.7	65.3	64.2	- 3.4
Japan	67.0	69.5	67.6	+0.6

Source: Latulippe, 1996, p10/14

Data for the United States are presented in more detail in Figure 15, below.

Figure 15



Source: Statistical Bulletin, MetLife, 1999, p5.

As one can see, in the United States, labor force participation rates are no longer falling, but have bottomed out (see also, Burkhauser, 1996, p6). This, coupled with the dramatic shift in availability of labor that will occur when the Baby-Boom starts to retire (especially after 2010) leads this writer to the conclusion that the trend to earlier and earlier retirement has or will soon end, and that there will be an absolute reversal in this trend. In fact, it is the author's contention that by 2015 there will be more stories about labor shortages (certainly for skilled labor) than about unemployment, and there will be more pressure for later retirement than for early retirement.

What will that mean for the design and administration of employer-sponsored pension plans? One would expect that in the normal realm of labor economics, once older workers determine they are a scarce and valued commodity, they will bargain for more acceptable work arrangements. This might mean higher compensation, but it could just as easily mean pension benefits more attuned to their needs. For example, a worker might ask to be allowed to work Tuesday through Thursday, and contribute to the pension plan, but then take every Friday and Monday off and draw pension benefits on those two days. Or, similarly, a worker might suggest a work year covering the seven months from April to October during which the worker would be employed full-time and contribute to the pension plan, but for the months from November to March, the worker would be considered 'retired' and draw from the pension plan. Neither of

these arrangements exist today within a normal pension plan (in fact, they would not be allowed under the regulations for Qualified/Registered plans), but there is nothing to stop them from being created actuarially.

Further, one must become aware of the fact that retirement is not a one-time, one-day event. Workers do not go from 40 hours a week to full-time leisure. It is now estimated that between 30 and 50 percent of people move into their 'final' retirement via partial retirement, or use 'bridge jobs' from their 'career' jobs into retirement, and that this process can take up to five years. Further, it is the best educated workers who have been forced to retire early who are most likely to return to a bridge job (see McDonald, 1996, Burkhauser, 1996 and Quinn, 1997/99). Thus, what is needed is not costlier retirement benefits, but more flexible retirement benefits and administration that can be tailored to the needs of the individual worker. The day of 'one size fits all' should be over. What is needed are employers, pension plans and regulations that allow for a longer-term transition from full-time work to full-time retirement. Workers should not have to leave their primary or career employer to find 'bridge jobs'. They should be able to find 'bridge jobs' where their skills are most valuable, and that is within their career post. To do otherwise is to deny and waste a huge asset, namely the older worker.

Finally, Defined Benefit plans that are integrated with Social Security (i.e. OASDI and C/QPP) will have to be cognizant of any future benefits reductions by the government, since, depending on the design of the plan, reductions in government benefits would be automatically matched by increases in employer-sponsored benefits. In Canada, 82 percent of pension plan members are in integrated plans.

--Group Benefits

As the population ages, so too will the labor force. Many of the risks covered by Employer-sponsored Group Benefits have age-related costs. Thus, as the members of the covered workforce age, on average there will be rising benefit costs associated with that aging.

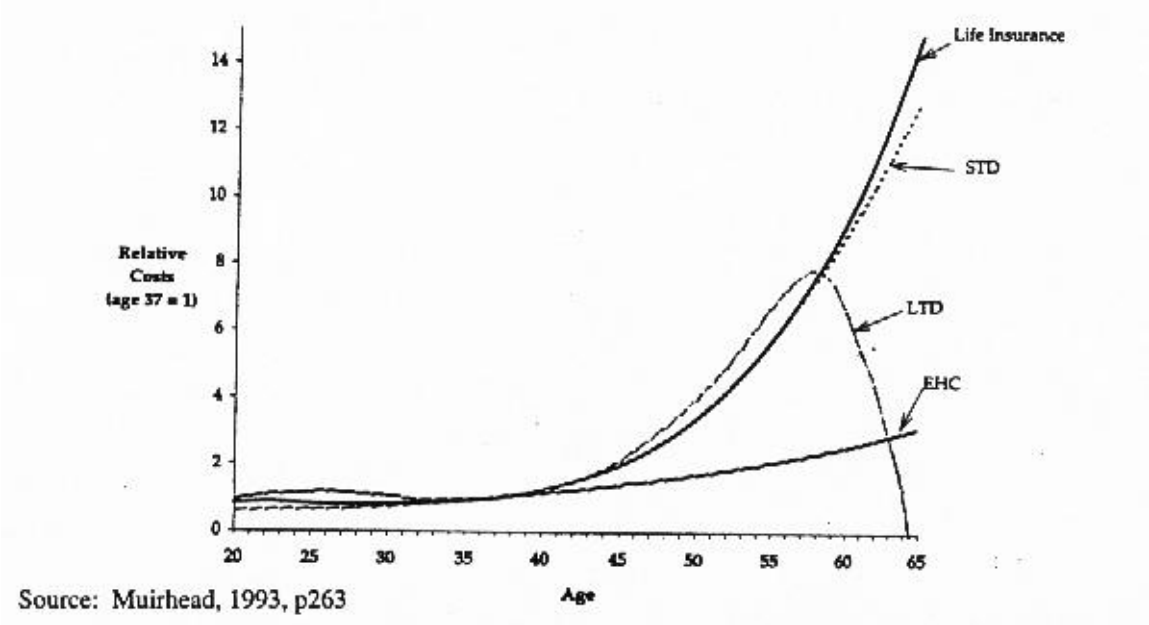
The impacts of the aging of the Canadian workforce were analyzed by Muirhead (1993). The growth factors presented in his work would be similar for the United States, although the absolute costs may differ.

Muirhead projected Group Life and Health benefits by assuming the demographics of the workforce, by age, would mirror that of the general population from which the workforce is drawn. Expected mortality comes from the 1985-87 Canada Life Tables. Extended Health Care (EHC) costs are based on age/sex specific Canadian cost factors. Long Term Disability (LTD) costs use the 1987 Group LTD Table and an interest rate of 8 percent. Short Term Disability (STD) is based on the 1985 CIDA Table. It is assumed that Group Dental costs are not affected by population aging.

The relative size of these group benefit costs (age 37 = 1) is shown in Figure 16.

Figure 16

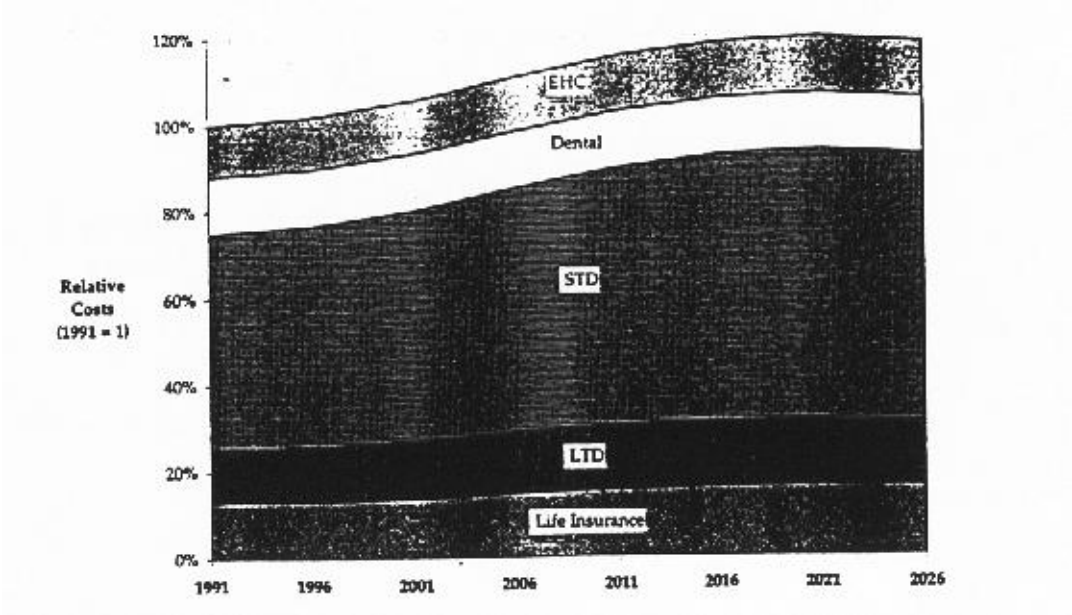
Group Insurance Costs



Applying these age-specific relative cost factors to the aging labor force population results in group benefits costs that rise 20 percent faster than payroll over the period 1991 to 2021 because of population aging alone (e.g. no improvement in benefits in any way).

Figure 17

Projected Group Benefit Costs



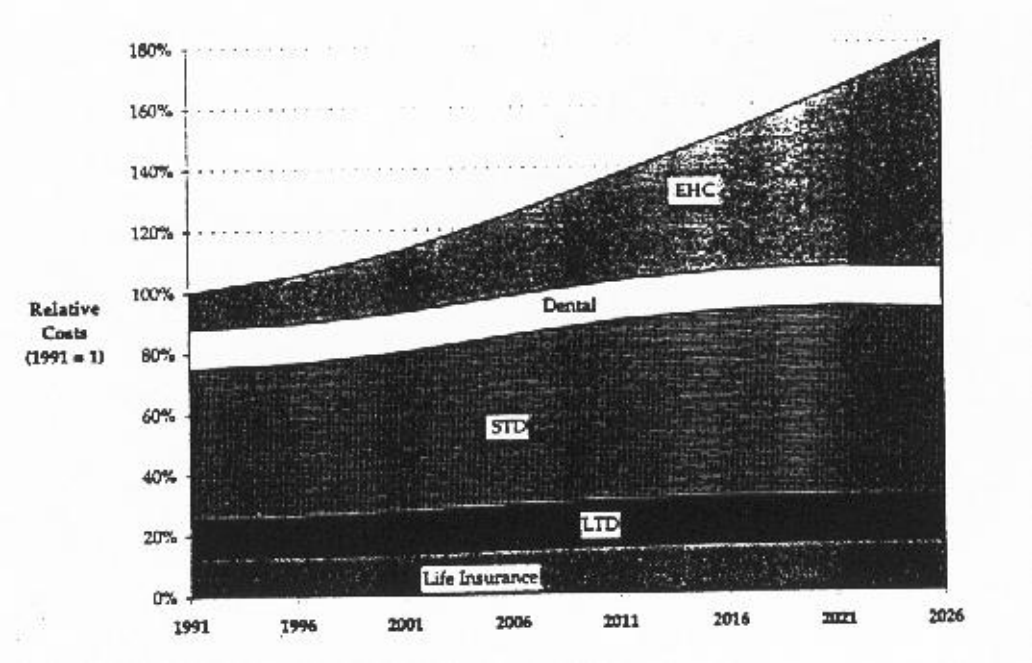
Source: Muirhead, 1993, p26

In Canada, that would mean a rise in group benefit costs from 5 percent of payroll to 6 percent of payroll.

However, that analysis assumes that the only force driving costs upward is population aging. This may not be a realistic assumption, particularly with respect to Extended Health Care costs. Health care costs in Canada have been rising much more rapidly than inflation because of the attempt by governments to limit their costs by pushing more of the benefits covered back onto the employers and also because of the rapid rise in costs for prescription drugs. Costs for health care in the United States have also been rising more rapidly than inflation as the total bill for health care in the United States now approaches 15 percent of GNP. Thus, Muirhead did another projection of Group Benefit costs in which he assumed that Extended Health Care (EHC) costs rose 5 percent per annum faster than payroll. The impact of this assumption, along with the modeling of workforce aging resulted in the following projected costs.

Figure 18

Projected Group Benefit Costs



Source: Muirhead, 1993, p266

In Canada, this would mean group benefit costs of 5 percent of payroll in 1991 would rise over 60 percent to 8.3 of payroll in 2021, and 9 percent of payroll in 2031.

Obviously, employer/plan-sponsors will be looking for ways to minimize these impacts. One should expect pressure on group benefit consultants to find ways to redesign plans in a manner that limits the cost risk to the employer. Thus, one should expect to see continued desires for 'Defined Contribution' plans such as Cafeteria Plans. This also fits into the demographics that were explained earlier whereby employees can be expected to want a level of control over the benefits they choose (especially if they contribute), particularly if their spouse has group benefits that might duplicate the coverage.

New products may have to be designed. For example, long-term care coverage, whether to fund future needs of existing workers, or to pay for parental care today, may be a product that will be requested by many workers and unions. It could also be offered as an individual product. This is a risk not covered by government plans in either Canada or the United States.

Finally, at the insurers' level, labor force growth rates experienced over the last twenty years are now history. The size of the labor force is not expected to change measurably in the near future. Thus, the ability to increase group coverage volume must come from increasing market share and, thus, by taking business away from another carrier. Therefore, the industry should continue to expect sharp competitive pressures in this line of business.

3. Individual Coverages

This paper has painted a gloomy picture of the capability of the government and the employer to provide improved economic security programs in the face of population aging. However, these 'problems' for governments and employers become opportunities for individual sales.

Individuals are extremely cynical about their security in relying on government promises for future social security benefits. In Canada, only 23 percent of those aged 30 to 39 are confident they will receive Old Age Security and C/QPP Benefits (Gallup Poll, 1994). In the United States, only 22 percent of those aged 35 to 44 expressed confidence that "in the years to come, the Social Security and Medicare systems will continue to provide benefits of equal value to the benefits received by retirees today" (Greenwald & Associates, 1991).

Further, the level of economic security provided by government-sponsored programs is small. In both Canada and the United States, a worker who always earns exactly the Average Industrial Wage (AIW) and retires with nothing but social security will realize a 40 percent replacement of final salary in retirement. That is clearly not enough to provide a consistent standard of living. Further, for workers who have wages higher than the AIW, their replacement ratio from government programs gets smaller and smaller as their wages rise.

Thus, individuals know that they must provide for their own retirement income security. Fortunately, the government provides significant tax incentives to encourage that activity. Hence, it should be an easy task for the insurance industry to promote these tax-advantaged products to a public that does not believe in their government-sponsored systems.

Take, for example, a worker at the Average Industrial Wage who wishes to retire with a 70 percent replacement ratio. The worker has been told that the government social security system will provide 40 percent of that target, but that the other 30 percent must be met through individual savings. Assume, further, that the worker is allowed to make retirement contributions out of before-tax income (or equivalently that these contributions are tax deductible) and that any investment returns are not taxed until taken as income. Such products are called "Registered" products in Canada, and "Qualified" products in the United States.

Again, the goal of the worker is to retire with a 70 percent replacement ratio.

Were the worker to use an ordinary savings vehicle, without any tax advantages, Table 8 shows the required percentage of salary that must be saved to fund a 70 percent replacement ratio.

Table 8

Required Percentage of Salary that must be Saved Using Non-Tax-Advantaged Funds For a 70 Percent Replacement Ratio

Gender	Age at Which Saving Starts	Age at Retirement 60	65
Male	25	15.0	10.8
	35	21.0	14.5
	45	35.0	21.7
Female	25	18.2	13.5
	35	25.5	18.0
	45	42.5	26.9

Source: Author's calculations

This table can be used for a number of purposes. First, it shows that without the use of qualified or registered funds, it is very difficult to achieve retirement income security with savings rates that are realistic. Second, it shows just how difficult it is to retire early. Finally, it displays the funding requirement differences between males and females because of the longer life expectancies of females (given that they buy gender-specific annuities in retirement).

Table 9, however, displays the same required percentage of salary that must be saved if one uses tax-advantaged vehicles.

Table 9

Required Percentage of Salary that must be Saved Using Tax-Advantaged Funds For a 70 Percent Replacement Ratio

Gender	Age at Which Saving Starts	Age at Retirement 60	65
Male	25	8.9	6.4
	35	13.6	9.4
	45	24.7	15.3
Female	25	10.3	7.6
	35	15.7	11.1
	45	28.5	18.1

Source: Author's calculations

Comparison of Tables 8 and 9 show that, depending on gender and the age at which savings start, the required savings rate is almost cut in half by using registered or qualified plans. However, it still costs a lot more to retire at age 60 versus age 65, and to provide income security for a woman than for a man.

Another example of how a problem that was previously identified in this paper can be turned into an opportunity for an individual salesperson is the prediction that employers will try to control their group benefit costs in an aging workforce by limiting the total contribution they will make to such benefit schemes and by passing the risk of higher costs over to the employee (e.g. through Defined-Contribution Cafeteria Plans). Any reduction in group benefits that results clearly creates the need for individual coverage to fill the gap. Also, a highly mobile workforce is one that may not feel secure about the constancy of group benefits. Now only will there be periods of no coverage when one is between jobs, but there will be inconsistencies in coverage from one employer to the next that will encourage workers to provide more in the way of individual coverage. The growing percentage of workers who are self-employed and/or contract workers will expand this market.

In total, the aging population, once understood, should be a positive force for those working in the design and sales of individual economic security products.

V One Last Problem

So far, this paper has been a balance of problems and opportunities. In fact, each problem seems to create an equal opportunity for someone in the industry.

However, there is one economic reality that must be faced that may prove difficult for an industry that promises to provide economic security for its customers and clients.

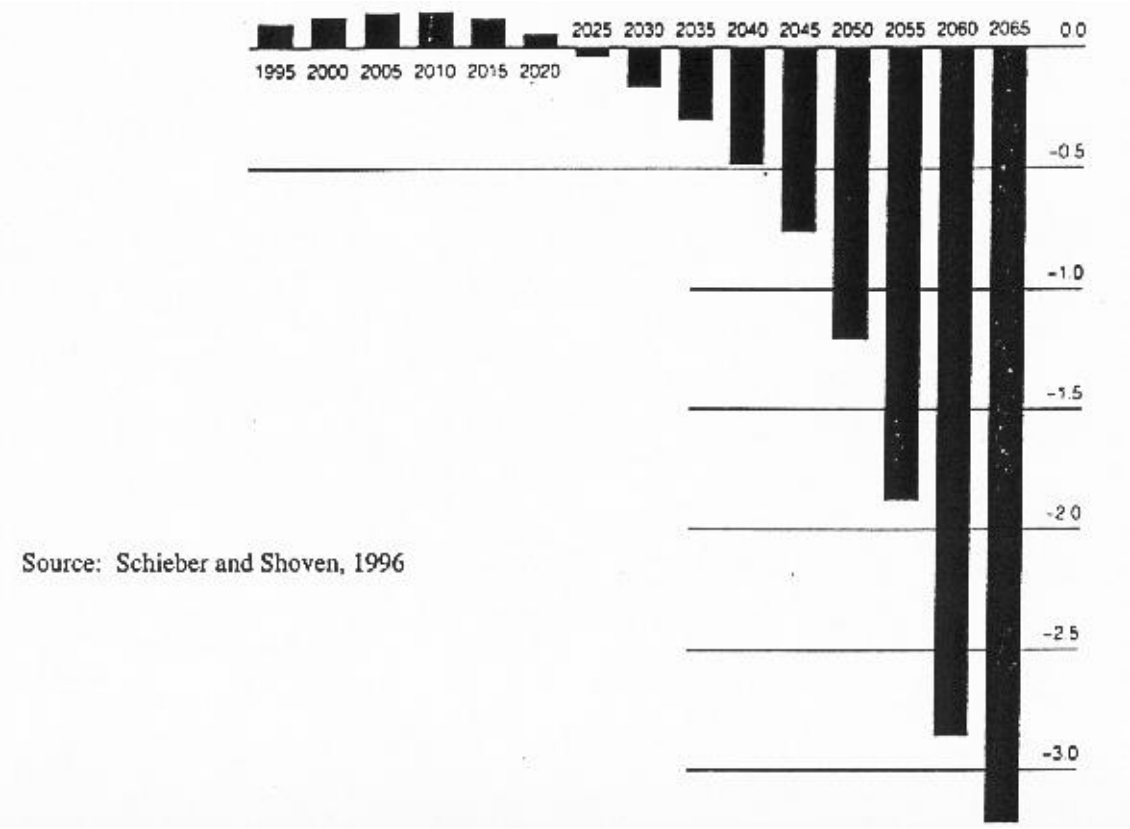
We are today in the midst of the longest bull market ever seen. Why is this? One reason has to be the demographics of the investment market. The Baby-Boom is in its period of saving for retirement either individually or through an employer-sponsored pension plan. This should continue for at least another twenty years. That does not mean that there will be a continuous bull market for another twenty years—that will be decided by a myriad of economic forces (e.g. the Asian flu). However, it can be said that there will be a continuation of macro-economic savings by individuals for the next twenty years which will provide upward pressure on stock values. (This basic economic law of supply and demand could be debated if one were to assume an infinite supply of good-quality shares).

But what happens when the Baby-Boom retires? What happens when they turn to their consumption phase and wish to liquidate their savings?

Figure 19 gives an indication of how rapidly and significantly these forces could change.

Figure 19

Net Flow of Assets Into or Out of Pension and Retirement Savings 1995 to 2065



It is well and good to tout the marvels of the stock market when times are good, and when the supply of investable dollars is large and growing. But what is the real value of those stocks (i.e. is it their quoted NYSE price listing)? Their real value is the goods and services produced by the companies they represent. If there is no production of goods and services, then there is zero value to these shares. Similarly, if there is no production of goods and services, there can be no transfer of wealth from workers to retirees through the proxy of a social security system.

But what happens to government-sponsored social security, to employer-sponsored pension assets, and to individual savings when everyone wants to liquidate and consume, but not produce? Will the projected liquidation displayed in Figure 18 happen? The answer is—it cannot. There will not be an absolute stock market meltdown, because other economic forces will intervene. Clearly the world of Figure 18 is one where there would be more demand for consumables than there would be production of consumable goods and services. This would be occuring at the same time as the asset values of the retired population would, in theory, be plummeting (and this scenario would hold also for their fixed assets such as their homes) again because of a supply and demand dis-equilibrium.

But Economics 101 has the answer to this apparent problem. Were there to be such a dis-equilibrium, the price of consumables would rise and the value of assets being liquidated would fall until a new equilibrium would be reached. That, in turn, implies that the retirees of the next century will not do as well as they might today anticipate. They will have to pay more for goods and services than they may anticipate, and pay these increased costs with deflated asset values.

But, fortunately, there is another solution--one to which the paper has already alluded.

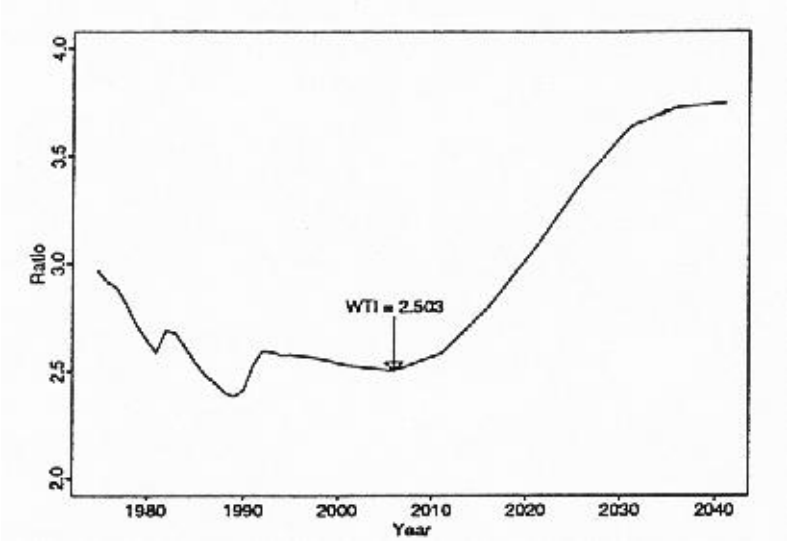
The equilibrium between production and consumption (and the equilibrium that will assure share values) can be maintained if we find a way to produce more goods and services when needed. That can be achieved in two ways. First, we can maintain or increase the size of the labor force. Second, we can increase the productivity of every worker.

Maintaining or increasing the size of the labor force will most likely necessitate the provision of significant incentives for workers to stay active longer, as outlined earlier. Work by Brown, Damm and Sharara (1999) has shown that the extra period of work that would be necessary to maintain economic balance, is not as dramatic a shift as one might presume.

Brown *et.al.* looked at the demands that would exist for transfer of wealth as the Baby-Boom retired (i.e. demands from dependent Canadians to share in the production of workers). Their results are displayed in Figure 20. The numeric value of the Wealth Transfer Index has no meaning in and of itself. It is only the shift in the demand for wealth transfers that is important.

Figure 20

Wealth Transfer Index for Canada
1976 to 2041

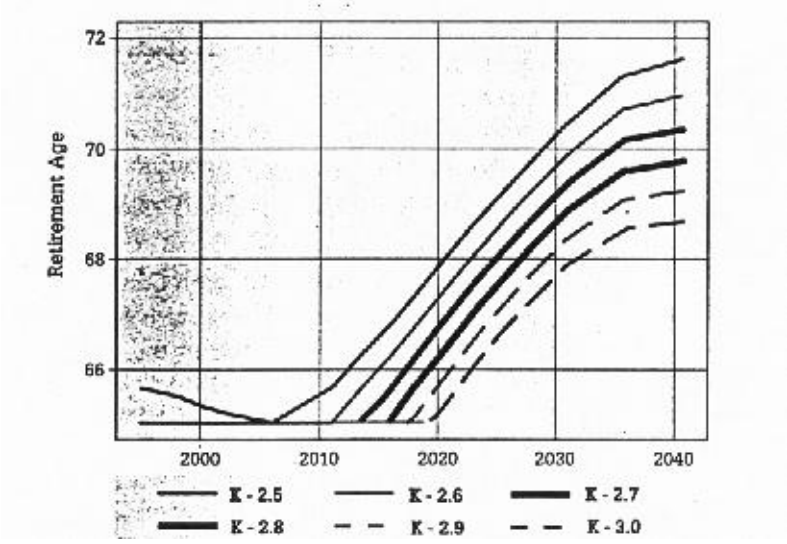


Source: Brown, Damm and Sharara, 1999

Based on a social security normal retirement age of 65, and today's labor force participation rates, Brown and Bilodeau (1997) modeled the shift that would have to take place in retirement patterns to hold the transfer of wealth constant at a given level (i.e. somewhere in the range where k = 2.5 to 3.0 in Figure 20). Their results are shown in Figure 21.

Figure 21

Normal Retirement Age for Certain
Constant Wealth Transfer Indices (K)



Source: Brown and Bilodeau, 1997

The following results are consistent with the information displayed in Figure 21.

If 'society' deemed that it would only support a wealth transfer index of 2.5, then the normal retirement age would have to shift from age 65, starting in 2006, to age 71.6 by 2041. If, on the other hand, a wealth transfer index of 3.0 is deemed affordable, then no shift in the normal retirement age would be necessary until 2019, and the normal retirement age in 2041 would be 68.6.

The work of Brown and Bilodeau only analyzed government transfer of wealth through education, unemployment insurance, health care, and social security. However, the labor force participation rate shifts that would have to take place on a macro-economic level would parallel these indications. However, instead of talking about shifting the retirement age from 65 to 69 (say), we might be looking at a worker who would now expect to retire at age 60 staying the labor force until age 64. Thus, to maintain a constant wealth transfer capability should require workers to stay active between four and six extra years. That is all.

Brown and Bilodeau argue that that might be acceptable in terms of public policy because life expectancy has improved measurably this half century with no commensurate rise in the age of entitlement for social security. Brown and Bilodeau show for Canada (which introduced the C/QPP and GIS in 1966) the retirement age that would keep life expectancy (and hence the expected period of receipt of social security benefits) constant at its 1966 level.

Table 10

Retirement Age for Equivalent Life Expectancy

Year	Male	Female	Combined
1966	65.0	65.0	65.0
1981	66.5	67.8	67.2
2001	69.2	69.9	69.6
2021	71.5	71.7	71.6
2041	73.8	73.6	73.7

Source: Brown and Bilodeau, 1997

Thus, it can be seen that the shift required in labor force participation is less than the shift in improved life expectancy over the period of analysis. It is this author's opinion that this is, therefore, a saleable public policy stance. As an aside, it is interesting that while the United States has already announced a two-stage rise in the normal retirement age for OASDI, from age 65 to age 67, Canada rejected that as a public policy initiative in the latest round of social security reforms.

What may be more important in this analysis is that the rise in normal retirement age proposed by Brown and Bilodeau (i.e. four to six years of extra labor force participation) does not include any assumed improvement in worker productivity. This is an important element.

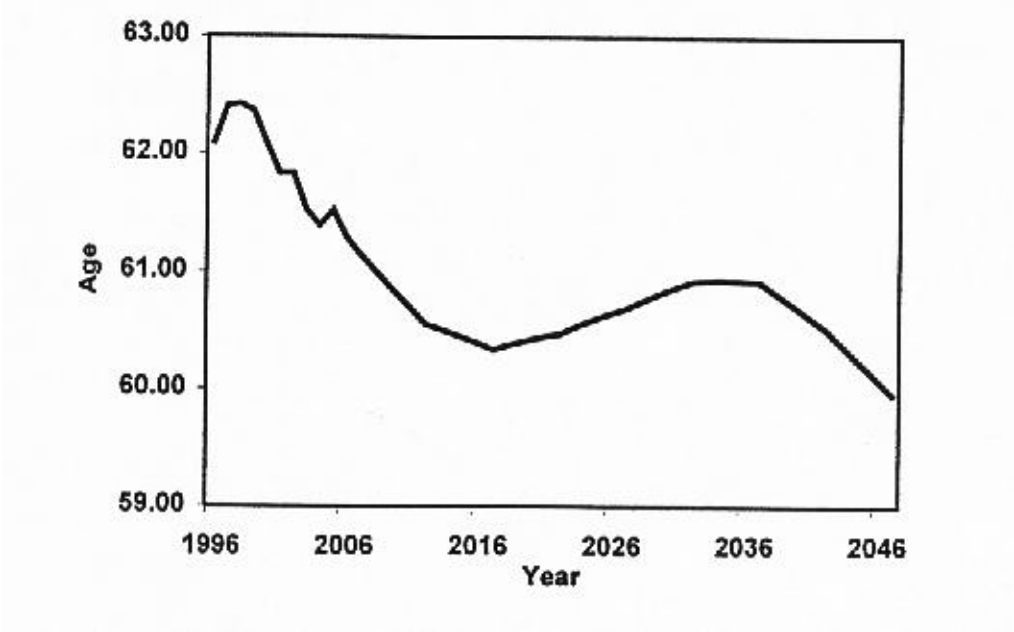
Today, in both Canada and the United States there are close to five workers for every retired elderly person. However, by the year 2040 it is projected that that ratio will be closer to 2.5-to-

one (assuming today's labor force participation rates remain unchanged). This means an effective doubling of the demands per worker to provide goods and services to the retired elderly. However, if every worker could become twice as productive between now and 2040, then the required transfer of wealth from workers to retirees could occur without any shift in labor force participation rates. A doubling of productivity over a forty year period requires only 1.7 percent real growth in productivity per annum. These were growth rates that were achieved in the 1950's, but have not been seen over the past decade. However, with proper education of the workforce and sufficient capital investment per worker, there is no reason why these growth rates could not be achieved, and the problem solved, with no shift in the age at retirement.

Brown, Damm and Sharara (1999) have analyzed the impact that productivity would have on the models created by Brown and Bilodeau. Assuming a 0.9 percent per annum increase in productivity (which is exactly what was achieved in Canada from 1976 to 1998) Brown *et. al.* showed that the following median retirement ages (in Canada) would result in a constant equilibrium between the production and consumption of goods and services.

Figure 22

Median Retirement Age in Canada
(1996 to 2047)



Source: Brown, Damm, Sharara, (1999, p8)

From Figure 22 we can see that the median retirement age needed to achieve production/consumption equilibrium can decrease until 2017, where it reaches a local minimum of 60.3 years. After this date, even with 0.9% per annum increases in productivity, the median retirement age must rise to achieve the production/consumption equilibrium. The increase is projected to last until 2034 when the median retirement age reaches a local maximum of 60.9 years. After that, the retirement age is again projected to decrease (to 60.6 in 2041 and 60.0 in 2047).

The author does not present this analysis as goals that can be achieved if correct public policy is legislated (e.g. a rise in the age of eligibility for social security) but rather events that are inevitable in a stable economy.

VI Conclusion

In discussing many of the aspects of population aging reviewed in this paper, many authors use the word "crisis". For example, a recent analysis of social security systems around the world by the World Bank (1994) was entitled: "Averting the Old Age Crisis".

The word "crisis" is very interesting. It requires two Chinese characters for a literal translation. In turn, if these two Chinese characters are translated back into English, their literal translation is: "dangerous opportunity".

For those responsible for the design, pricing and marketing of Life, Health and Pension products, the aging population is, indeed a "dangerous opportunity". The workers and consumers of both Canada and the United States are desperately seeking economic security. With each passing day, they have less and less faith in the ability of their governments to provide them with that security. Instead, they are looking to the private insurance sector to fill that void and supply those products. This will be a challenge, but it will also be a great opportunity for those who are properly prepared for it.

It is the author's hope that some of the facts presented in this paper will help with that important preparation.

Bibliography

Barer, M. L. R. B. Evans, C. Hertzman (1995). Avalanche or Glacier?: Health Care and the Demographic Rhetoric. *Canadian Journal on Aging.* Vol. 14, No. 2, 193-224.

Barr, N. (1993). *The Economics of the Welfare State.* Weidenfeld and Nicolson, London.

Bayo, R. (1988). Measures of Actuarial Balance for Social Insurance Programs. *Record, the Society of Actuaries.* Volume 14, No. 1, 161-179. Chicago.

Brown, R. L. and C. Bilodeau (1997). The Canadian Wealth Transfer Index. *Proceedings of the Canadian Institute of Actuaries.* To appear.

Brown, R. G., R. Damm, and I. Sharara (1999). *A Macro-Economic Indicator of Age at Retirement.* Institute of Insurance and Pension Research. Report # 99-15. University of Waterloo.

Brown, R. L. (1991). *Economic Security in an Aging Population.* Butterworths Canada, Toronto.

_____ (1997). *Introduction to the Mathematics of Demography, 3rd Ed.* Actex Publications, Winsted, Conn.

Burkhauser, R. V. (1996). *Touching the Third Rail: Alternative Solutions for Bringing the Social Security Retirement System into Long-Term Balance.* The Bowles Symposium, Georgia State University, Atlanta, Georgia, September. Also summarized as the Editorial in *The Gerontologist,* Volume 36, No. 6. 726-727. December.

Denton, F. T., C. H. Feaver, and B. G. Spencer (1998). The Future Population of Canada, Its Age Distribution and Dependency Relations. *Canadian Journal on Aging,* Vol. 17, No. 1, 1998, 83-109.

Easterlin, R. A. (1980). *Birth and fortune: The Impact of Numbers of Personal Welfare.* Basic Books, New York.

Ermisch, J. F. (1983). *The Political Economy of Demographic Change.* Heinemann Books, London.

Foot, D. K. (1982). *Canada's Population Outlook.* Canadian Institute for Economic Policy. Ottawa.

Greenwald & Associates, Inc. (1991). *National Taxpayers Union Foundation Survey on Retirement Confidence.* Washington, D. C.

Health and Welfare (1989). *Charting Canada's Future: A Report of the Demographic Review.* Ministry of Supply and Services. Ottawa.

Hertzman, C., J. Frank, and R. G. Evans (1994). Heterogeneities in Health Status, in *Why Are some People Healthy and Others Not?* Edited by R. G. Evans, M. L. Barer and T. R. Marmor, Aldine de Gruyter, New York.

Latulippe, D. (1996). *Effective Retirement Age and Duration of Retirement in the Industrial Countries Between 1950 and 1990.* Issues in Social Protection. Discussion Paper No. 2, Social Security Dept. International Labour Office, Geneva.

Levy, F. and R. C. Michel (1985). Are Baby Boomers Selfish? *American Demographics* Vol. 7, No. 4, April, pp 39-44.

Maclean's Magazine (1998). *Women: Dominant Force in Automotive Market.* Advertising Supplement, p6, August 17.

Marshall, V. W. (1987). *Canada, Social Perspectives, 2nd ed.* Fitzhenry and Whiteside, Markham, Ontario.

McDonald P. L. (1996). *Transitions into Retirement: A Time for Retirement.* Final Report. Human Resources Development, Canada. August.

Menard, Jean-Claude (1992). Presentation of the QPP Actuarial Report. *Proceedings of the Canadian Institute of Actuaries.* Vol. XXIII, No. 1, 261-271. Ottawa

MetLife (1999). Early Retirement in the United States. *Statistical Bulletin.* Vol. 80, No. 3, July-September, pp 2-7.

Muirhead, P. M. (1993). "The Aging Population". *Proceedings of the Canadian Institute of Actuaries.* Vol. XXIV, No. 2, 248-271. Ottawa.

Myers, R. J. and B. C. Schobel (1992). "An Updated Money's-Worth Analysis of Social Security Benefits. *Transactions of the Society of Actuaries,* Vol. XLIV, 247-270.

Office of the Superintendent of Financial Institutions (1995). *Canada Pension Plan Fifteenth Actuarial Report as at December 31, 1993.* Ottawa.

Quinn, J. (1997a). The Role of Bridge Jobs in the Retirement Patterns of Older Americans. In Philip deJong and Theodore Marmor (eds.), *Social Security and the Labor Market.* Ashgate Publishing Ltd., London, pp 91-116.

_____ (1997b). Retirement Trends and Patterns in the 1990's: The End of an Era?" *The Public Policy Aging Report.* Vol. 8, No. 3. Summer, pp 10-15.

_____ (1998). New Paths to Retirement. Working Paper. To appear.

Schieber, S. and J. Shoven (1996). "Where Your Bull Is?" *New York Times,* Sunday, March 10, New York.

Statistics Canada. *Life Tables, Canada and the Provinces.* Several. Ministry of Supply and Services. Ottawa.

United States, Bureau of the Census (1993). *We the American Elderly.* September.

United States Department of Commerce (1993). *An Aging World II:* International Population Report Series P-95:92-3. February. Wahington: Bureau of the Census.

United States National Center for Health Statistics. *United States Life Tables.* DHHS. Several. Hyattsville, Md.

Walker, A. (1990). The Economic 'Burden' of Ageing and the Prospect of Intergenerational Conflict. *Ageing and Society* (10), 377-394.

World Bank (1994). *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth.* A World Bank Policy Research Report, New York, Oxford University Press.