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Age Dependency Ratios and Social Security Solvency

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Summary

The aging of the population of the United States, hastened by the impending retirement of the huge baby-boom generation, has caused some policy-makers to question whether the U.S. Social Security system can meet the demands for retirement benefits in the future. The financial health of the system, which is largely financed through taxes paid by current workers in a pay-as-you-go manner, is sensitive to the ratio of dependents to workers — sometimes called the dependency ratio or support ratio.

Trends and projections of age dependency ratios, including the relationship between both older (years 65 and older) and younger (under age 20) dependents to the working-age population in the United States are considered in the first section of this report. If one considers the 130 year period from 1950-2080, the greatest demographic "burden" — when the number of dependents (children plus the elderly) most exceeds persons in the working-age population — is already in the past, having reached its height in 1965 when there were 94.7 dependents per 100 persons of working age. However, the composition of the dependency ratio is changing. The number of children per worker has been falling since 1965; most of the anticipated increase in the dependency ratio in the coming decades reflects a growing proportion of older persons (ages 65 and older). Age-specific trends in the age dependency ratios are not off-setting in terms of their federal budget implications. Programs administered by the federal government (especially Social Security and Medicare) focus much more heavily on assisting the elderly population whereas state and local governments have historically provided substantial support for families with children through spending on elementary and secondary education and other programs.

Next, the United States is compared to nine other nations. Seven of the countries are members of the G8, a consultative grouping of leading industrial democracies — Canada, France, Germany, Italy, Japan, Russia, the United Kingdom. (The United States is the 8th member). In addition, China and India, the two most populous countries globally, are included to highlight that population aging is occurring even in nations that are less industrialized and have "younger" current age structures. Population aging, which largely results from declining fertility rates and increasing survival, is a global phenomenon. Today, the United States is the "youngest" of the industrialized G8 nations. While the proportion of the U.S. population that is aged 65 and older will continue to increase, aging in the United States is still projected to be considerably slower than in any of the other industrialized countries.

In the final section, policy implications of the changing dependent-to-worker ratios are considered in the context of pay-as-you-go (paygo) social security systems.

This paper will be updated as needed.

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Background

> Social Security's financing problems ... are very large and serious. People are living longer, the first baby-boomers are nearing retirement, and the birth rate is low. The result is that the worker-to-beneficiary ratio has fallen from 16.5-to-1 in 1950 to 3.3-to-1 today. Within 40 years it will be 2-to-1. At this ratio there will not be enough workers to pay scheduled benefits at current tax rates.[1]

As highlighted by the Social Security Administration, the aging of the (United States) population, hastened by the impending retirement of the huge baby-boom generation,[2] has caused policy-makers to question whether the U.S. Social Security system can meet the demands for retirement benefits in the future. Because the current system largely pays benefits through taxes paid by current workers,[3] the financial health of the system is sensitive to the ratio of dependents to workers — sometimes called the dependency ratio or support ratio.[4] Trends and projections of age dependency ratios, including the relationship between both older (years 65 and older) and younger (under age 20) dependents to the working-age population in the United States are considered in the first section of this report. Next, the United States is compared to nine other nations, including the seven other members of the G8.[5] In the final section, policy implications of the changing dependent-to-worker ratios are considered in the context of pay-as-you-go (paygo) social security systems.

Age Dependency Ratios

This section summarizes information on trends and projections over time in the ratio of working-age persons to persons in the dependent ages in the United States for the period 1950-2080.

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[1] Social Security Administration, *Social Security's Future — FAQs, Frequently Asked Questions About Social Security's Future*, at [http://www.ssa.gov/qa.htm], accessed May 10, 2005.

[2] Americans born in years 1946 to 1964.

[3] This is often referred to as a pay-as-you-go (or "paygo") system.

[4] Christine L. Himes, "Elderly Americans," *Population Bulletin*, vol. 56, no. 4 (Dec. 2001).

[5] The G8 is a consultative grouping of leading industrial democracies — Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States.

Definitions

The age-dependency ratio relates the number of persons in "dependent" ages (defined here as persons under the age of 20 and over age 64) to those in "economically productive" ages (20-64 years) in the population. It addresses the question of how many dependents are being supported per 100 persons of working age.[6] The age-dependency ratio is divided into old-age dependency (the ratio of persons 65 years and older to those in the working ages 20-64) and child dependency (the ratio of people under age 20 to those ages 20-64).[7]

Trends

Based on data contained in the 2005 Trustees Report (Social Security Administration (SSA)),[8] **Figure 1** shows the estimated and projected trends in age-dependency ratios for the period 1950-2080 in the United States. Ratios for years 1950-2003 are based on actual data; years 2004-2080 are projections which rely upon assumptions about future trends in mortality, fertility, and immigration. A detailed table with the underlying population data and age dependency ratios for years 1950-2080 is provided in **Appendix Table 1**. Data in this section and in **Appendix Table 1** reflect the Social Security actuaries' intermediate assumptions (i.e., their best guess) of future trends in the underlying assumptions. The impact of variability in the assumptions used for the projections is considered later in this report (**Figure 2**).

As seen in **Figure 1**, there were 72.5 dependents per 100 persons of working age in 1950 — of these, 58.7 dependents were children while 13.8 were older persons. The total dependency ratio reached its height in 1965, just after the last of the Baby Boom generation was born. In 1965, there were 94.7 (of which 76.5 were children and 18.2 were older persons) dependents per 100 persons of working age. There have been divergent trends for the child and old-age dependency ratios in recent decades with the child ratio generally falling and that of older persons increasing. Children continue to out-number older persons in their contribution to the total dependency ratio in 2005 by a sizable margin — there are 46.3 child and 20.3 older dependents per 100 persons of working age.

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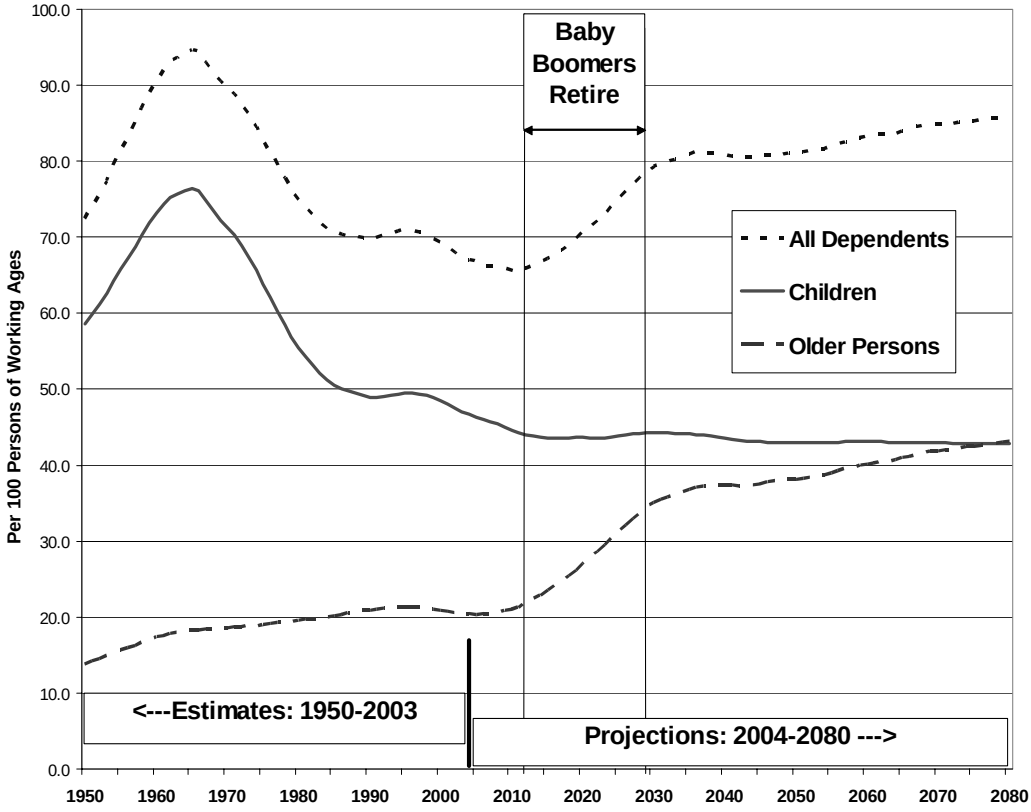
[6] Alternatively, one could ask how many workers there are to support each dependent. A graph of these trends, which is not analyzed in the text of this report, is provided in **Appendix Figure 1**.

[7] These age breaks are arbitrary. These are the age breaks used by the SSA in its reporting of the status of the Social Security trust funds. The age at which a worker could receive full Social Security benefits (the full retirement age, FRA) was, until recently, age 65. The FRA will gradually rise from 65 to 67 years beginning with people who attained age 62 in 2000 (those born in 1938). See CRS Report 94-622, *Social Security: Raising the Retirement Age Background and Issues*, by Geoffrey Kollmann.

[8] *2005 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Funds*, Mar. 23, 2005, available at [http://www.ssa.gov/OACT/TR/TR05/index.html], accessed Mar. 29, 2005. (Hereafter cited as *Trustees Report, 2005*.)

Figure 1. Dependency Ratios: Number of Dependents per 100 Persons of Working Age, United States, 1950-2080



Source: Congressional Research Service (CRS) analysis based on statistical tables in: *2005 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Funds*, Mar. 23, 2005, available at [http://www.ssa.gov/OACT/TR/TR05/trLOT.html], accessed Mar. 29, 2005.

Notes: "Dependents" refers to the population under age 20 and age 65 and older; working age refers to persons aged 20-64 inclusive. Ratios for years 1950-2003 are based on actual data; years 2004-2080 are projections which rely upon assumptions about future trends in mortality, fertility, and immigration. Projections use SSA's intermediate assumptions.

Older Dependents. The old-age dependency ratio has generally been increasing since 1950. The baby boom generation (persons born between 1946 and 1964) will accelerate the rate at which the old-age dependency ratio changes. Baby boomers will begin to attain age 65 beginning in 2011 (for those born in 1946) and continuing through 2029 (for those born in 1964). As highlighted in **Figure 1**, the older age dependency ratio will quickly increase as a result of the aging of the baby boom generation, from about 21.3 to 34.4 older dependents per 100 persons of working age between 2011 and 2029. Population aging,[9] however, will continue to be one of the most important defining demographic characteristics of the U.S. population, even after the youngest of the baby boom generation passes away. The number of older dependents per 100 persons of working age will continue to increase, albeit at a slower pace than will be experienced during the years in which

[9] As measured by increases in the median age of the population and increases in the proportion of the population aged 65 and older.

the baby boomers retire. Based on the SSA Trustees' current assumptions, there will, for instance, be 43.1 older dependents per 100 workers in 2080.

These trends reflect forecasts of continuing improved survival at the older ages and continuing low fertility rates.[10] Increasing rates of survival mean a greater number of older dependents (the numerator of the ratio), which in turn increases the old-age dependency ratio. Fewer (than current) births will mean fewer young dependents in the short-run, but will translate into fewer future workers in about two decades. At that time, the net effect will be that the old-age dependency ratio will be increasing (as the number of dependents will be increasing in the numerator) while the number of working age persons to support them will be falling (in the denominator). From the perspective of the Social Security program, the old-age dependency ratio is the most critical of the dependency measures as it relates the number of potential Social Security recipients ($ outlays) to the number of projected payroll tax payers ($ income). Thus, the lower the old-age dependency ratio, the lower the dollars paid out versus received, and the better the finances of the Social Security program outlook.

How Useful Are Dependency Ratios?

The standard definition of a support ratio is a simple ratio of the number of persons in broad age groups. The ratios do not reflect whether the people of working age are actually economically productive or whether the older person and children are economically dependent. For instance, many older persons are financially and physically independent whereas there are substantial portions of the working-age population who may not earn incomes because they are unemployed, unable to work, in school, in prison, or have opted out of the labor force.

Although it is difficult to include factors such as intra-family financial assistance in an overall measure of social support, it is feasible to consider employment characteristics of the populations in the relevant age groups. Estimates of the "economically active population" can be further adjusted to account for average retirement ages, levels of pension receipt, institutionalization, the prevalence of disabilities, and other factors.

This information has been adapted from K. Kinsella, and D. R. Phillips, "Global Aging: The Challenge of Success," *Population Bulletin*, vol. 60, no. 1, Mar. 2005.

Child Dependents. Referring again to **Figure 1 and Appendix Table 1**, the child dependency ratio increased from 58.7 to 76.5 child dependents per 100 working age adults between 1950 and 1965, largely reflecting the birth of the baby boom generation. Since 1965, the child dependency ratio has experienced a mostly steady decline due to falling fertility rates in the United States. Nonetheless, in 2005, the number of child dependents is more than double the number of older dependents — 46.3 and 20.3 per 100 working age adults, respectively.

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[10] Note that improved survival and decreased fertility are the root causes of the aging boom though immigration also contributes to trends in dependency ratios over time. Immigration is currently and is projected to remain over-shadowed by the trends in mortality and fertility in the dependency ratios. See CRS Report RL32701, *The Changing Demographic Profile of the United States*, by Laura B. Shrestha.

The SSA Trustees' current projections assume that child dependency ratios will slowly decline through year 2080 but that the rate of decline will be very slow. Child dependency ratios will stay in the narrow range of 42.8 to 46.0 child dependents per 100 working age adults throughout this 75-year time span.

Note that, even with the pending retirement of the baby boom generation, the number of child dependents will continue to be greater than the number of older dependents for the majority of the time frame considered here. Based on the SSA intermediate projections, the number of older dependents will first outpace child dependents in 2078.

Some Take-Away Messages

- If the Social Security population estimates and projections for the 130-year period of 1950-2080 are correct, then the greatest demographic "burden" — when the number of dependents (children plus the elderly) relative to the working-age population — is already in the past, having reached its height in 1965 when there were 94.7 dependents per 100 persons of working age.

- The composition of the dependency ratio is changing. The number of children per worker has been falling since 1965; most of the anticipated increase in the dependency ratio in the coming decades reflects a growing proportion of older persons (ages 65 and older). These age-specific trends in the age dependency ratios are not, however, off-setting in terms of their federal budget implications. Programs carried out by the federal government focus much more heavily on assisting the elderly population. Based on estimates from the Congressional Budget Office (CBO), the federal government spent a little over one-third of its budget — about $615 billion — on transfer payments and services (with the Social Security and Medicare entitlement programs being the biggest expenditures) for people age 65 and older in FY2000. Federal spending on children was about $148 billion, or $175 billion if payments to the children's parents were included.[11] State and local governments have historically provided substantial support for families with children through spending on elementary and secondary education and other programs. Nevertheless, because federal spending dwarfs state and local figures, total government spending for the average person 65 years or older is still much greater than for the average child.[12]

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[11] Congressional Budget Office (CBO), *Federal Spending on the Elderly and Children*, July 2000, at [http://www.cbo.gov], accessed June 17, 2005. (Hereafter cited as CBO, *Federal Spending on the Elderly and Children*.) See also CRS Report RS22008, *Federal Spending for Older Americans*, by April Grady, Bob Lyke, and Richard Rimkunas (hereafter cited as CRS Report RS22008); and (2) C. Eugene Steuerle, "The Incredible Shrinking Budget for Working Families and Children," *National Budget Issues*, no. 1, Dec. 2003.

[12] CBO, *Federal Spending on the Elderly and Children*.

- Age dependency ratios, while providing a glimpse at how the age structure of the population is changing, are nonetheless crude measures that do not take into consideration whether persons of working age are actually working and supporting the economy, nor whether dependents are truly economically dependent and receiving transfers from working-age persons. Furthermore, as noted by Friedland and Summer,[13] "society's future is not determined solely by demographic changes. Focusing on the anticipated growth in population by age group is just too simplistic an approach. Rather, the future is shaped by the choices made — or not made — individually and collectively, bounded by the limits in resources and, in particular, knowledge. Knowledge is at the heart of gains in productivity, economic growth, and the advances in medical care, agriculture, communication, transportation, and the environment."

Variability of Future Projections

The ratios reported here are CRS compilations based on estimates and projections from the SSA.[14] The information for years 1950 (the earliest available year) to 2003 are estimates that are based on actual data; the information for years 2004-2080 are projections, which rely upon assumptions about future mortality, fertility, and immigration patterns.

To address the uncertainty that is inherent in all population projections, SSA constructs several sets of projections which are based on different combinations of assumptions. The data represented here uses the intermediate set of projections in the Trustees Report, which represents the Board's best estimate of the future course of the population. The Trustees produce two additional sets of projections, the "high-cost" and "low-cost" scenarios, which use differing assumptions about the future courses of fertility, mortality, and immigration. **Figure 2** highlights the possible variation in the total dependency ratio through 2080 under these three different scenarios. While SSA's best guess of the total dependency ratio in year 2080 is 85.9 dependents per 100 persons of working age, the range of possible values varies from 81.9 to 94.8.

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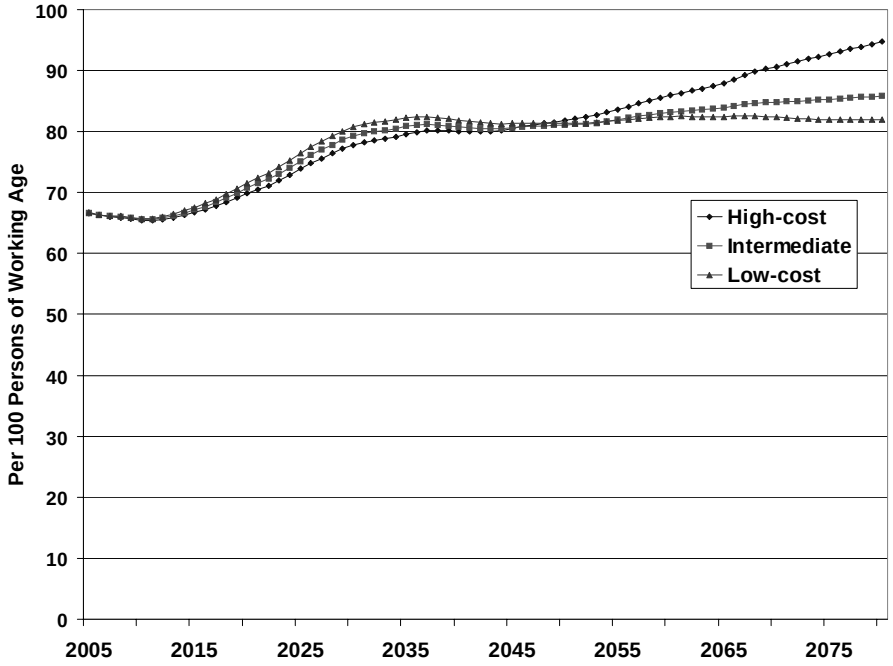
[13] Robert B. Friedland and Laura Summer, *Demography Is Not Destiny, Revisited*, Commonwealth Fund Publication 789 (New York, Mar. 2005), p. v. (Hereafter cited as Friedland and Summer, *Demography is Not Destiny*.)

[14] *Trustees Report, 2005*.

Figure 2. Total Projected Dependency Ratio, 2005-2080, Under Three Sets of Assumptions of Future Mortality, Fertility, and Immigration



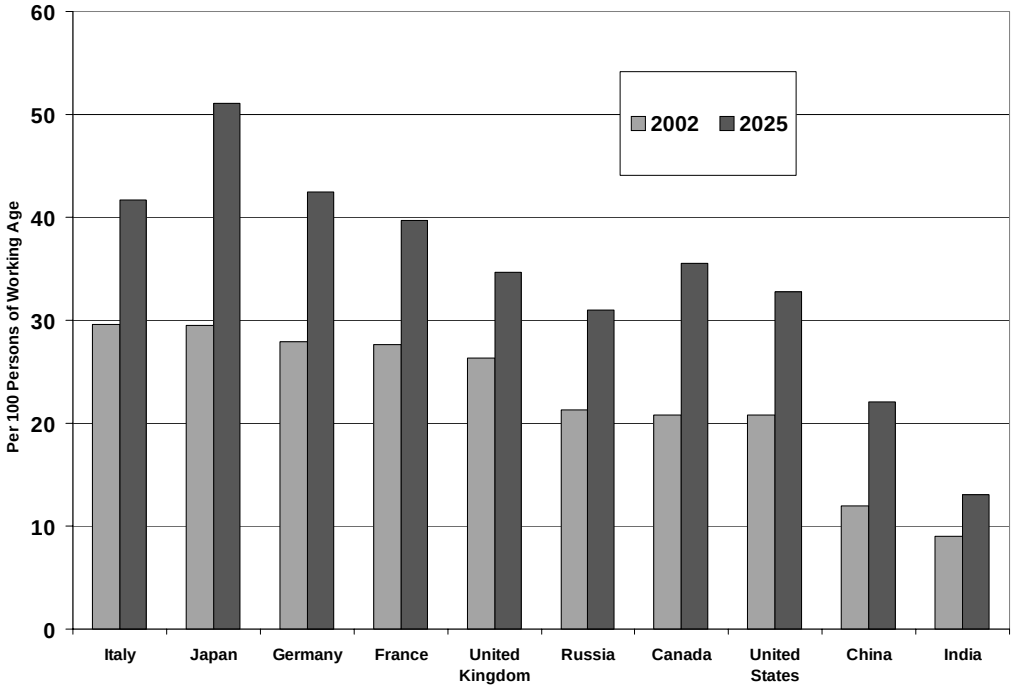
Source: Congressional Research Service (CRS) analysis based on statistical tables in: *2005 Annual Report of the Board of Trustees of the Federal Old-Age and Survivor's Insurance and Disability Funds*, Mar. 23, 2005, available at [http://www.ssa.gov/OACT/TR/TR05/trLOT.html].

An International Comparison: Is the American Situation Unique?

Figure 3 presents statistics on the number of *older* persons supported per 100 persons of working age in 2002 in 10 countries.[15] Eight of the countries are members of the G8, a consultative grouping of leading industrial democracies — Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States. In addition, China and India, the two most populous countries globally, are included to highlight that population aging is occurring even in nations that are less industrialized and have "younger" current age structures.

[15] CRS compilation based on U.S. Census Bureau, International Population Reports WP/02, *Global Population Profile, 2002* (Washington, DC: GPO, 2004).

Figure 3. Number of Older Dependents per 100 Persons of Working Age in Selected Countries, 2002 and 2025



Source: Congressional Research Service (CRS) compilation based on U.S. Census Bureau, International Population Reports WP/02, *Global Population Profile, 2002* (Washington, DC: GPO, 2004).

Notes: Figures for China exclude Taiwan, Hong Kong S.A.R., and Macau S.A.R. Countries are sorted by highest *old-age* dependent-to-worker ratio in 2002. Estimates relate the number of persons age 65 and older per 100 persons of working age (20-64) regardless of the usual age of retirement or age at entry into the work force in each of these countries.

Of the 10 countries included in the comparison, Italy ranked first, with Japan close behind, in terms of the number of older persons being supported per 100 workers in 2002 — 29.6 and 29.5, respectively. Among the G8 countries, Canada and the United States were tied for last place at 20.8[16] older persons per 100 persons of working age — indicating that the Canadian and American "burdens" are less than that of the other G8 countries.[17] Not coincidentally, the proportions of their population aged 65 and older — 13% and 12% respectively in 2000 — are also the lowest of the G8 nations. In India, with its young age structure, there were only 9.0 older persons per 100 persons of working age. The *total* age dependency ratio (not shown in graph) is, however, greatest for India among the 10 countries — there are 90.5 dependents (mostly children) per 100 persons of working age.

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[16] Note that the Census Bureau's estimate of the old-age dependency ratio for the United States in 2002 was 20.8, which is slightly higher than Social Security's estimate of 20.6 for the same year (as seen in **Figure 1 and Appendix Table 1**).

[17] Note, however, that the *total* dependency ratio is greater in the United States than in Canada since Americans are supporting a higher number of children.

Figure 3 also highlights that population aging is a global phenomena — the number of older dependents per 100 persons of working age is projected to increase through 2025 in all 10 of the countries considered here. The projected increase in Japan, where the ratio will reach 51.1, is especially notable. Italy and Germany will each have over 40 older dependents per 100 persons of working age. Increases are also expected in both China and India. In fact, the old-age dependency ratio in 2025 in China[18] will exceed the level observed in the United States, Canada, and Russia today.

Figure 4 shows the number of *child* dependents per 100 persons of working ages. India had the highest child dependency ratio in 2002 at 81.5. Of the G8 countries considered, the United States was the leader, largely reflecting the fact that the American fertility rate, while currently hovering around the replacement level,[19] has not fallen as far as in the other G8 nations. For instance, the total fertility rate in Italy was 1.2 in 2002 compared to 2.1 in the United States in the same year. The estimates for India and China, and to a lesser extent the Russian Federation, are also affected by differential (higher) rates of infant and childhood mortality.

Unlike the increasing old-age dependency ratios highlighted in **Figure 3**, the child dependency ratios are projected to *fall* through 2025 in most of the countries considered. The notable exception is the United States where it is projected that there will be 47.4 child dependents in 2025, as there had been in 2002.

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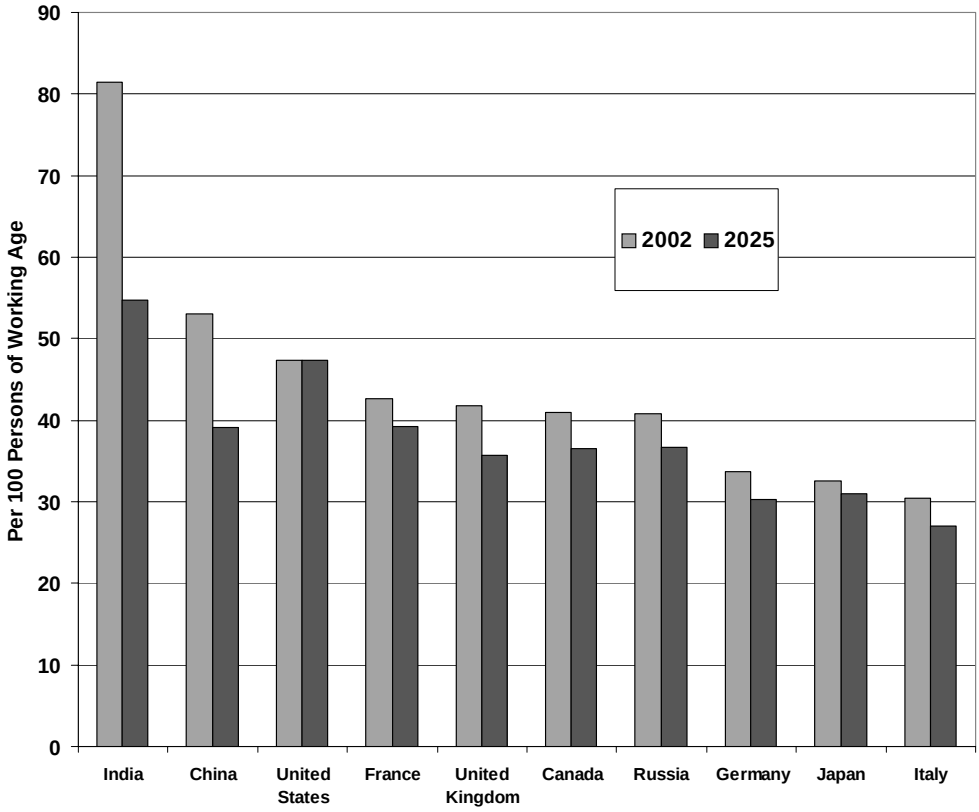
[18] China's age structure is quickly transforming from that of a "young" population to that of an older one, as measured by the mean age of the population and proportions in the relevant young and old age groups. The speed of population aging in China is also significantly faster than had been observed in the G8 countries. In China, it is expected that 26 years (from 2000-2026) will be required for the percent of the population age 65 or older to rise from 7% to 14%. In comparison, 115 years (from 1855-1980) were required in France; 69 years in the United States (1944-2013); and 65 years (1944-2009) in Canada. See Kevin Kinsella and David R. Phillips, "Global Aging: The Challenge of Success," *Population Bulletin*, vol. 60, no. 1, Mar. 2005.

[19] The level of fertility and mortality in a population at which women will replace themselves in a generation, in the absence of migration. It corresponds to a total fertility rate (the average number of children a cohort of women would have by the end of their childbearing years) in the range of 2.04 to 2.10.

Figure 4. Number of Child Dependents per 100 Persons of Working Age in Selected Countries, 2002 and 2050



Source: The Congressional Research Service (CRS) compilation based on U.S. Census Bureau, International Population Reports WP/02, *Global Population Profile, 2002* (Washington, DC: GPO, 2004).

Notes: Figures for China exclude Taiwan, Hong Kong S.A.R., and Macau S.A.R. Countries are sorted by highest *child* dependent-to-worker ratio in 2002. Estimates relate the number of children age under 20 years per 100 persons of working age (20-64) regardless of the usual age at entry into the work force in each of these countries.

In summary, population aging, which results primarily from declining fertility rates and increasing survival, is a global phenomenon. Today, the United States is the "youngest" of the industrialized G8 nations. While the proportion of the U.S. population that is aged 65 and older will continue to increase, aging in the United States is still projected to be considerably slower than in any of the other industrialized countries.[20] In addition to reflecting the fact that the American fertility rate, which is currently hovering around the replacement level, has not fallen (nor is it projected to) as far as the other G8 nations, the "U.S. is leading the way in adapting to the changing balance ... by encouraging immigration."[21] The SSA estimates that

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[20] Friedland and Summer, *Demography is Not Destiny*.

[21] David E. Bloom, A. K. Nandakumar, and Manjiri Bhawalkar, "The Demography of Aging in Japan in the United States," revised version of paper originally presented at a conference (continued...)

net legal immigration and net other immigration were about 530,000 persons and 400,000 persons, respectively, in 2003. For its future projections, SSA assumes the total level of net immigration (legal and other, combined) under the intermediate projection to be 1,075,000 persons in 2005 and 900,000 persons in 2025 and each year afterward.[22] While these comparatively high levels of immigration differentiate the United States from the other G8 nations, they have a small effect on the median age of U.S. residents and on the total dependency ratio as immigrants are mostly young people who have children (and also higher fertility rates than the U.S.-born population). Immigration nudges the worker-elderly ratio a little higher, meaning that there are more people of working age per person age 65 or older. The more dramatic effect, however, is at the younger ages. Immigration after 2000 is projected to add about 15 million more children under age 18 than there would be without any post-2000 immigration. Continued immigration will lower the worker-child ratio and increase the child component of the dependency ratio.[23]

Implications for a Paygo Social Insurance Program

What is Paygo?

Most Western industrialized nations, including the United States, have systems in place providing significant social security benefits, and virtually all of these plans originated with pay-as-you-go (paygo) or quasi-paygo funding schemes.[24] In the United States, payroll or self-employment tax contributions by current workers (and their employers) are transferred to current beneficiaries. The majority of Social Security taxes paid by today's workers are not put into a special account to pay for their future benefits. Rather, they are used to pay benefits for persons receiving benefits today, just as the future benefits for today's workers will be paid by future generations of workers. In general, a low ratio of retirees to workers (the system's old age dependency ratio) and a high rate of productivity and real wages would permit a paygo social security system with high benefits or low contributions.[25]

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[21] (...continued)
on "Aging and Health: Environment, Work, and Behavior" (Cambridge, MA: American Academy of Arts and Sciences, Sept. 2000). Available at [http://www.riverpath.com/library/ documents/demography_of_aging_in_japan_and.htm], accessed July 1, 2005.

[22] *Trustees Report, 2005*.

[23] Philip Martin and Elizabeth Midgley, "Immigration: Shaping and Reshaping America," *Population Bulletin*, vol. 58, no. 2, June 2003.

[24] Robert L. Brown, "Paygo Funding Stability and Intergenerational Equity," *Transactions of Society of Actuaries*, vol. 47, 1995. (Hereafter cited as Brown, *Paygo Funding Stability*.) Note that significant modifications have been made to the original designs of the systems over time.

[25] Estelle James, *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth*, World Bank Policy Research Report, 1994. (Hereafter cited as James, *Averting the Old Age Crisis*.)

What Made Paygo an Attractive Option for Financing Social Security Systems?

Advantages of government-sponsored paygo schemes relative to fully funded systems include:[26]

- The entire working population can be covered relatively easily;
- The benefits can serve as social insurance against the (income) risks associated with old-age and disability;
- Benefits can be immediately vested and are fully portable, an important feature for a mobile work force;
- Administrative costs are usually very low.

Given these advantages, paygo systems looked very attractive in the immediate post-World War II years. Projections of labor force growth, coupled with forecasts of real wage growth, implied a potential total annual return near 5% for a fully mature paygo system. In contrast, the common view of a funded system involved investing contributions in government securities with a return of 1% or less. In the aftermath of the Great Depression, the market for equities seemed far too risky, and many countries lacked private bond markets. Furthermore, most countries instituting a new pension system were unwilling to delay initial benefit payments for several decades, as would have been required under a funded system. There was a desire to address the immediate problem of high poverty among the elderly, and most countries provided benefits to an older generation of workers which had not contributed fully to the system.[27] Also, to many at that time, a high rate of population growth (and subsequent work force growth) seemed inevitable, in which case pay-as-you-go seemed a good way to finance an old age pension program.[28]

The Current Outlook for Paygo, Given Demographics and Other Factors

The current outlook is much different. Birth rates have fallen considerably while the life expectancy at the older ages has increased significantly, resulting in less favorable old-age dependency ratios (as shown in **Figures 1 and 2**). While the old-age dependency ratio had already been increasing since 1950, the upcoming retirement of the baby boom generation will accelerate the rate at which it grows. However, even after the youngest of the baby boom generation has passed away, the number of older dependents per 100 persons of working age will still continue to increase, albeit at a slower pace than will be experienced during the years in which the baby boomers retire.

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[26] See, for instance, Brown, *Paygo Funding Stability*.

[27] Barry Bosworth and Gary Burtless, "Pension Reform and Saving" (Washington, DC: Brookings Institution). Paper prepared for a conference of the International Forum of the Collaboration Projects, held in Tokyo, Japan, Feb. 17-19, 2003. (Hereafter cited as Bosworth, *Pension Reform and Saving*.).

[28] James, *Averting the Old Age Crisis*.

Concurrent with these demographic trends, the Congressional Budget Office (CBO) projects that federal spending for Social Security, adjusted for inflation, will rise substantially — from $483 billion in 2003 to $2.5 trillion in 2075.[29] The projected rise in Social Security spending is due, in part, to the demographics of an aging society — CBO estimates that approximately 55% of the higher spending is due to the expected increase in the number of beneficiaries, as the number of new claimants grows and as life expectancy rises. The remaining 45% of the rise is due to a projected increase in the real value of Social Security benefit checks. Specifically, they note that, under rules put into effect in 1979, benefits of newly eligible recipients are based on a formula and earnings records that are adjusted for wage growth. Those adjustments, referred to as wage indexing, are designed to keep the ratio of initial benefits to pre-retirement earnings — that is, replacement rates — approximately the same from one generation of new recipients to the next. Wages tend to rise along with productivity in the economy, at a faster pace than prices and, over the long run, a system pegged to wage growth will gradually afford greater purchasing power.[30]

As both CBO and the Government Accountability Office (GAO) are warning, current spending policies are likely to be unsustainable.[31] The policy implication is that, unless there are large offsetting productivity gains in the U.S. economy, contribution rates by current workers (e.g., tax rates) must markedly rise or benefit levels must fall under Social Security's paygo system. Alternatively, the structure of the underlying paygo system could be modified such that part or all of the scheme is fully funded. This, however, raises the same issues that caused most countries to originally select paygo systems — reduction of (investment) risk and the need to pay benefits for the current generation of beneficiaries.

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[29] Congressional Budget Office, *The Future Growth of Social Security: It's Not Just Society's Aging, An Issue Summary from CBO*, no. 9, July 2003, at [http://www.cbo.gov].

[30] Ibid. See also CRS Report RL32900, *Indexing Social Security Benefits: The Effects of Wage and Price Indexes*, by Patrick Purcell, Laura Haltzel, and Neela Ranade.

[31] See CRS Report RS22008.

Appendix Table 1. Age Dependency Ratios, United States, 1950-2080

(Number of dependents per 100 persons of working age)

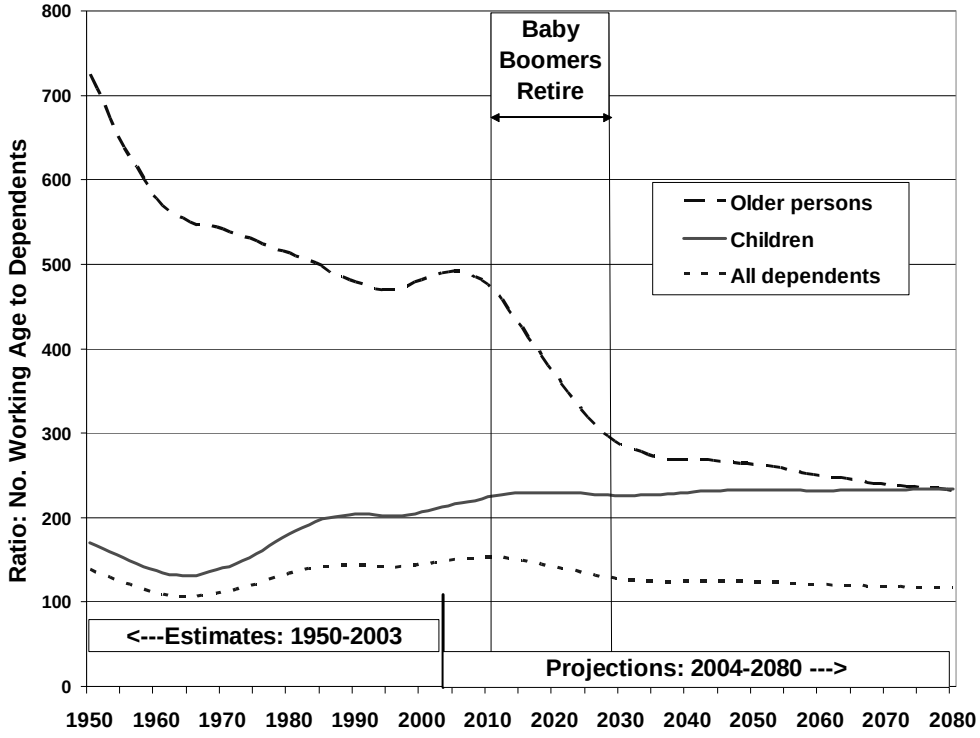
Year	Population (in thousands)				Dependency ratio (number of dependents per 100 persons of working age)		
	Total	Children (0-19)	Working age (20-64)	Older persons (65-65+)	All dependents	Children (0-19)	Older persons (65-65+)
1950	160,118	54,466	92,841	12,811	72.5	58.7	13.8
1951	163,808	56,419	94,102	13,287	74.1	60.0	14.1
1952	166,368	57,923	94,727	13,719	75.6	61.1	14.5
1953	168,978	59,600	95,209	14,168	77.5	62.6	14.9
1954	171,687	61,398	95,656	14,632	79.5	64.2	15.3
1955	174,510	63,261	96,176	15,073	81.4	65.8	15.7
1956	177,878	65,313	97,075	15,490	83.2	67.3	16.0
1957	181,324	67,401	97,992	15,931	85.0	68.8	16.3
1958	184,305	69,374	98,538	16,393	87.0	70.4	16.6
1959	187,236	71,256	99,129	16,851	88.9	71.9	17.0
1960	190,172	73,076	99,818	17,278	90.5	73.2	17.3
1961	193,151	74,858	100,614	17,679	92.0	74.4	17.6
1962	196,082	76,444	101,576	18,062	93.0	75.3	17.8
1963	198,876	77,766	102,703	18,407	93.6	75.7	17.9
1964	201,540	78,997	103,796	18,746	94.2	76.1	18.1
1965	204,018	80,132	104,795	19,091	94.7	76.5	18.2
1966	206,281	80,743	106,116	19,422	94.4	76.1	18.3
1967	208,421	80,724	107,932	19,766	93.1	74.8	18.3
1968	210,494	80,616	109,755	20,123	91.8	73.5	18.3
1969	212,547	80,571	111,477	20,499	90.7	72.3	18.4
1970	214,765	80,684	113,158	20,923	89.8	71.3	18.5
1971	217,039	80,755	114,913	21,371	88.9	70.3	18.6
1972	219,105	80,502	116,784	21,819	87.6	68.9	18.7
1973	220,955	79,961	118,718	22,276	86.1	67.4	18.8
1974	222,755	79,247	120,742	22,767	84.5	65.6	18.9
1975	224,599	78,437	122,857	23,305	82.8	63.8	19.0
1976	226,501	77,576	125,054	23,871	81.1	62.0	19.1
1977	228,524	76,700	127,366	24,457	79.4	60.2	19.2
1978	230,687	75,884	129,750	25,053	77.8	58.5	19.3
1979	232,932	75,161	132,117	25,653	76.3	56.9	19.4
1980	235,233	74,568	134,428	26,237	75.0	55.5	19.5
1981	237,627	74,126	136,693	26,808	73.8	54.2	19.6
1982	240,104	73,788	138,891	27,425	72.9	53.1	19.7
1983	242,541	73,493	141,028	28,020	72.0	52.1	19.9
1984	244,922	73,249	143,096	28,578	71.2	51.2	20.0
1985	247,335	73,211	144,957	29,167	70.6	50.5	20.1
1986	249,800	73,393	146,603	29,805	70.4	50.1	20.3
1987	252,313	73,703	148,197	30,413	70.3	49.7	20.5
1988	254,892	74,099	149,840	30,954	70.1	49.5	20.7
1989	257,608	74,545	151,581	31,483	69.9	49.2	20.8
1990	260,458	75,060	153,368	32,029	69.8	48.9	20.9
1991	263,372	75,749	155,036	32,587	69.9	48.9	21.0
1992	266,342	76,690	156,522	33,130	70.2	49.0	21.2
1993	269,273	77,751	157,931	33,591	70.5	49.2	21.3
1994	272,081	78,740	159,370	33,971	70.7	49.4	21.3

Year	Population (in thousands)				Dependency ratio (number of dependents per 100 persons of working age)		
	Total	Children (0-19)	Working age (20-64)	Older persons (65-65+)	All dependents	Children (0-19)	Older persons (65-65+)
1995	274,786	79,621	160,844	34,322	70.8	49.5	21.3
1996	277,511	80,433	162,457	34,620	70.8	49.5	21.3
1997	280,248	81,123	164,267	34,858	70.6	49.4	21.2
1998	282,898	81,710	166,161	35,027	70.3	49.2	21.1
1999	285,517	82,192	168,149	35,176	69.8	48.9	20.9
2000	288,255	82,557	170,274	35,423	69.3	48.5	20.8
2001	291,193	82,856	172,607	35,731	68.7	48.0	20.7
2002	294,164	83,138	175,009	36,017	68.1	47.5	20.6
2003	296,800	83,388	177,162	36,250	67.5	47.1	20.5
2004	299,207	83,623	179,092	36,493	67.1	46.7	20.4
2005	***301,673***	***83,859***	***181,017***	***36,798***	***66.7***	***46.3***	***20.3***
2006	304,170	84,093	182,875	37,202	66.3	46.0	20.3
2007	306,628	84,317	184,569	37,742	66.1	45.7	20.4
2008	309,050	84,490	186,177	38,383	66.0	45.4	20.6
2009	311,477	84,571	187,850	39,056	65.8	45.0	20.8
2010	313,912	84,579	189,544	39,788	65.6	44.6	21.0
2011	316,352	84,587	191,039	40,725	65.6	44.3	21.3
2012	318,795	84,647	192,230	41,918	65.8	44.0	21.8
2013	321,238	84,760	193,258	43,220	66.2	43.9	22.4
2014	323,677	84,915	194,215	44,547	66.7	43.7	22.9
2015	326,084	85,101	195,071	45,912	67.2	43.6	23.5
2016	328,455	85,333	195,826	47,296	67.7	43.6	24.2
2017	330,812	85,622	196,474	48,716	68.4	43.6	24.8
2018	333,152	85,934	197,001	50,217	69.1	43.6	25.5
2019	335,473	86,220	197,418	51,835	69.9	43.7	26.3
2020	337,774	86,412	197,819	53,542	70.7	43.7	27.1
2021	340,048	86,496	198,285	55,267	71.5	43.6	27.9
2022	342,289	86,544	198,746	57,000	72.2	43.5	28.7
2023	344,490	86,722	199,016	58,752	73.1	43.6	29.5
2024	346,646	87,028	199,087	60,532	74.1	43.7	30.4
2025	348,728	87,319	199,091	62,318	75.2	43.9	31.3
2026	350,729	87,590	199,118	64,022	76.1	44.0	32.2
2027	352,673	87,844	199,222	65,606	77.0	44.1	32.9
2028	354,554	88,078	199,361	67,115	77.8	44.2	33.7
2029	356,374	88,288	199,511	68,574	78.6	44.3	34.4
2030	358,133	88,477	199,758	69,897	79.3	44.3	35.0
2031	359,835	88,649	200,209	70,977	79.7	44.3	35.5
2032	361,481	88,806	200,821	71,854	80.0	44.2	35.8
2033	363,069	88,950	201,452	72,668	80.2	44.2	36.1
2034	364,601	89,082	201,977	73,542	80.5	44.1	36.4
2035	366,077	89,203	202,410	74,464	80.9	44.1	36.8
2036	367,500	89,317	202,910	75,273	81.1	44.0	37.1
2037	368,872	89,425	203,592	75,855	81.2	43.9	37.3
2038	370,196	89,528	204,415	76,254	81.1	43.8	37.3
2039	371,476	89,625	205,271	76,580	81.0	43.7	37.3
2040	372,715	89,718	206,118	76,880	80.8	43.5	37.3
2041	373,917	89,809	206,966	77,142	80.7	43.4	37.3
2042	375,086	89,904	207,782	77,400	80.5	43.3	37.3
2043	376,227	90,005	208,502	77,720	80.4	43.2	37.3

Year	Population (in thousands)				Dependency ratio (number of dependents per 100 persons of working age)		
	Total	Children (0-19)	Working age (20-64)	Older persons (65-65+)	All dependents	Children (0-19)	Older persons (65-65+)
2044	377,342	90,115	209,074	78,152	80.5	43.1	37.4
2045	378,435	90,236	209,519	78,680	80.6	43.1	37.6
2046	379,510	90,369	209,933	79,208	80.8	43.0	37.7
2047	380,571	90,514	210,397	79,660	80.9	43.0	37.9
2048	381,621	90,672	210,907	80,042	80.9	43.0	38.0
2049	382,663	90,842	211,415	80,407	81.0	43.0	38.0
2050	383,701	91,018	211,891	80,791	81.1	43.0	38.1
2051	384,736	91,197	212,352	81,188	81.2	42.9	38.2
2052	385,773	91,375	212,804	81,594	81.3	42.9	38.3
2053	386,811	91,553	213,208	82,050	81.4	42.9	38.5
2054	387,854	91,731	213,518	82,604	81.6	43.0	38.7
2055	388,902	91,909	213,749	83,244	81.9	43.0	38.9
2056	389,955	92,084	213,968	83,904	82.2	43.0	39.2
2057	391,015	92,256	214,223	84,536	82.5	43.1	39.5
2058	392,082	92,425	214,517	85,140	82.8	43.1	39.7
2059	393,155	92,589	214,843	85,724	83.0	43.1	39.9
2060	394,235	92,749	215,201	86,285	83.2	43.1	40.1
2061	395,320	92,904	215,603	86,812	83.4	43.1	40.3
2062	396,408	93,054	216,054	87,300	83.5	43.1	40.4
2063	397,499	93,199	216,523	87,777	83.6	43.0	40.5
2064	398,590	93,340	216,965	88,285	83.7	43.0	40.7
2065	399,680	93,477	217,322	88,881	83.9	43.0	40.9
2066	400,766	93,611	217,581	89,573	84.2	43.0	41.2
2067	401,847	93,743	217,813	90,291	84.5	43.0	41.5
2068	402,923	93,873	218,171	90,879	84.7	43.0	41.7
2069	403,993	94,003	218,650	91,341	84.8	43.0	41.8
2070	405,056	94,133	219,132	91,792	84.8	43.0	41.9
2071	406,112	94,264	219,612	92,236	84.9	42.9	42.0
2072	407,158	94,397	220,085	92,676	85.0	42.9	42.1
2073	408,195	94,531	220,547	93,117	85.1	42.9	42.2
2074	409,223	94,669	220,995	93,559	85.2	42.8	42.3
2075	410,242	94,809	221,426	94,006	85.3	42.8	42.5
2076	411,252	94,953	221,841	94,458	85.4	42.8	42.6
2077	412,252	95,099	222,240	94,913	85.5	42.8	42.7
2078	413,244	95,248	222,625	95,371	85.6	42.8	42.8
2079	414,229	95,400	222,998	95,831	85.8	42.8	43.0
2080	415,208	95,554	223,359	96,295	85.9	42.8	43.1

Source: Congressional Research Service (CRS) analysis based on statistical tables in: *2005 Annual Report of the Board of Trustees of the Federal Old-Age and Survivor's Insurance and Disability Funds* (Mar. 23, 2005), available at [http://www.ssa.gov/OACT/TR/TR05/trLOT.html], accessed Mar. 29, 2005.

Appendix Figure 1. Number of Working Age Persons per 100 Dependents, United States, 1950-2080



Source: Congressional Research Service (CRS) analysis based on statistical tables in: *2005 Annual Report of the Board of Trustees of the Federal Old-Age and Survivor's Insurance and Disability Funds* (Mar. 23, 2005), available at [http://www.ssa.gov/OACT/TR/TR05/trLOT.html], accessed Mar. 29, 2005.

Notes: This figure relates the number of workers (numerator) to the number of dependents (denominator). For example, in 1950, there were 725 workers to support every 100 persons age 65 and older. **Figure 1** in the main body of the text showed dependency ratios which relate the number of dependents (numerator) to the number of workers (denominator). In 1950, there were 13.8 older dependents per 100 workers.