

## COPING WITH DEMOGRAPHIC UNCERTAINTY

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### Introduction

The discussion of Social Security reform has centered around alternative plans to restore solvency based on the best available current projections. This is the same process that was followed in the past. In 1983 Congress enacted a bipartisan reform intended to ensure 75-year solvency for Social Security. But no sooner had Social Security been saved than the program slipped back into projected insolvency and the reform debate began anew. One reaction to this development, not without controversy, has been the notion that reform should aim at ensuring “sustainable solvency.” That is, Social Security reform should not just put the program on a sustainable footing for 75 years but should aim for projected balance over the indefinite – or even infinite – future. Consistent with this, it has become more common to focus not just on the aggregate 75-year impact of Social Security proposals but also to ensure that the cash flow balance is positive in the 75<sup>th</sup> year.

The experience since 1983, however, provides the motivation for another reaction that has not had much of an impact on policymakers: an emphasis on what I term “robust solvency.” Based on the projections at the time, the 1983 reforms should have been sufficient to roughly restore solvency through about 2064. The fact that Social Security again faces an imbalance is a reflection not just of the passage of time but also of the fact that reality has turned out somewhat differently than what was forecast just a few decades ago.

This experience raises the prospect that tremendous political effort could again go into “saving” Social Security only to find out ten or twenty years down the road that the problem was significantly under-solved or over-solved. Given the tremendous political difficulties and delays inherent in reforming Social

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Security it would be better, everything else being equal, to minimize the chance of this occurring. In addition, building contingency into a reform would eliminate one objection to acting sooner: the argument for an option value to waiting.

To date, the vast majority of research and policy work on Social Security has focused on solving the Social Security problem as if the future is known with certainty. Much less work has gone into what statisticians term the “second moments,” that is how the future might turn out differently than what we expect today. To get a sense of just how large these second moments are imagine a forecaster at the inception of Social Security in 1935 needing to predict World War II, the baby boom, the baby bust, and all the other changes in the following decades.

The institutional process of policymaking itself places virtually no emphasis on robust solvency. The Social Security actuaries, for example, score all Social Security plans only on the basis of the “intermediate” projections and do not show what the plan would look like under alternative assumptions about the future. The Congressional Budget Office shows a stochastic range of outcomes but does not provide any metrics to assess whether a plan is more or less “robustly” solvent.

Some recent proposals clearly fail the robust solvency test. “Price indexing” and “progressive price indexing,” for example, both deliver smaller reductions relative to scheduled benefits when productivity growth is lower and Social Security’s long-run imbalance is larger and *vice versa*.<sup>1</sup> Other proposals, including indexing some combination of benefit levels, payroll taxes or the normal retirement age to longevity would have the right sign: making larger changes if longevity widened Social Security’s imbalances. But even these proposals fall well short of solving the first order financing challenge (standard variants of longevity indexing eliminate less than one-third of the Social Security shortfall) and address only one of the many factors that increases second order uncertainty about future Social Security finances.

Social Security’s tax and benefit structure is already reasonably robust against variations in economic conditions. In the long run, benefits and taxes both rise with average wages and thus variations in the growth rate have little long-term impact on Social Security.<sup>2</sup> Program rules, however, are not robust against variations in demographic conditions, whether through fertility, mortality, or immigration. These demographic conditions are a much larger source of long-run uncertainty in Social Security.

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<sup>1</sup> Andrew Biggs and Jagdish Gokhale have shown that in some circumstances faster wage growth can worsen the actuarial balance over an infinite horizon (“Wage Growth and the Measurement of Social Security’s Financial Condition,” June 2006). Their finding, however, does not invalidate this point – it just states that faster wage growth may necessitate more prefunding, not that it would necessitate phasing in benefit cuts more rapidly.

<sup>2</sup> Growth has some impact because retirees do not share the benefits of contemporaneous productivity growth because, after retirement, the retirement benefit is indexed to price inflation, not wage growth.

A relatively simple mechanism could be incorporated into any reform and help make Social Security more robust. Specifically, the program could be “dependency indexed” to ensure that it can automatically adjust to overall changes in the demographic situation. Some combination of benefits (specifically the so-called “PIA factors” that determine benefits as a fraction of earnings) and payroll tax rates could vary proportionately with changes in the ratio of the aged to the working-age population. In a simplified system this would be sufficient both to restore long-term solvency and to ensure rough annual cash flow balance in the retirement portion of the program. The basic concept of dependency indexing would be relatively easy to explain and motivate, as evidenced by the fact that both President Clinton and President Bush frequently explain the looming shortfall in exactly these terms, describing the rising number of beneficiaries per worker (the inverse of the dependency ratio).

This paper first motivates the concept of “robust solvency” by examining past forecasting errors and likely future uncertainty. The paper then develops the proposal of dependency indexing and shows how it could be applied in practice.

### **The Reemergence of the Solvency Problem Following the 1983 Reforms**

In 1983, Congress enacted bipartisan legislation restoring Social Security solvency by trimming benefits, raising payroll taxes, and raising the normal retirement age. At the signing ceremony President Reagan promised that the legislation “assures the elderly that America will *always* keep the promises made in troubled times a half a century ago.”<sup>3</sup> In retrospect, “always” was overly optimistic. As little as a decade later, in 1993, President Clinton was talking about the need “to take action now to avert a crisis in the Social Security system.”<sup>4</sup> Social Security’s financial imbalance became the central economic issue in the late 1990s and again under President Bush in 2005.

#### *The 1983 Projections Turned Out to Have Been Too Optimistic*

Part of the reason that solvency returned to the forefront so quickly following the 1983 legislation was that the reforms were only designed to restore 75-year solvency. The 1983 Trustees Report, which incorporated this legislation, projected that the Social Security trust fund would remain solvent for the entire 75-year window (1983-2057) but would have large cash flow deficits and a declining trust fund by the end of this period.

Even if the 1983 projections were accurate, it was perfectly predictable that further changes would be required to ensure that Social Security remained

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<sup>3</sup> Ronald Reagan, April 20, 1983, “Remarks on Signing the Social Security Amendments of 1983,” available at: <http://www.reagan.utexas.edu/archives/speeches/1983/42083a.htm>. Emphasis added.

<sup>4</sup> President Clinton, February 9, 1998, “Remarks of the President on Social Security,” available at: <http://www.ssa.gov/history/clntstmts.html>.

solvent in the future as the 75 year window extended beyond 2064. This has led many policy analysts to recommend that any future Social Security reforms embrace the goal of “sustainable solvency,” that is ensuring that Social Security is made solvent indefinitely.<sup>5</sup>

But the conventional answer tells only part of the story. It misses the fact that the intermediate 1983 projections themselves turn out, in retrospect, to have been relatively far off the mark. In June 1983, following the reforms, the Trustees issued four sets of projections: ranging from optimistic (Alternative I, which projected 75 year solvency with a rising trust fund ratio at the end of the period) to pessimistic (Alternative III, which projected the trust fund would be exhausted in 2027). The Trustees’ non-political best guess was widely understood to be Alternative II-B. Extrapolating, this projection showed the trust fund being exhausted in 2064 and an actuarial deficit of -0.91 percent of taxable payroll for the current 75-year projection window, 2007-81. In contrast, the latest projections show Social Security has a 1.95 percent of payroll deficit over this period and the trust fund is expected to be exhausted in 2041. That is 23 years earlier than the projection made less than 25 years ago.

| <b>Table 1. Solvency Indicators for OASDI</b> |                             |                        |
|---|-----------------------------|------------------------|
|   | Actual / Current Projection | 1983 Projection (II-B) |
| <b>Solvency Data</b>                          |                             |                        |
| Actuarial Balance: 1983-2057                  | -0.84*                      | 0.02                   |
| Actuarial Balance: 2007-2081                  | -1.95                       | -0.91*                 |
| Trust Fund Exhaustion Date                    | 2041                        | 2064*                  |

\*Author’s estimates.

Source: Social Security Trustees, 1983 and 2007 Annual Reports and author’s estimates.

### *How Reality Turned Out Differently Than the 1983 Projections*

Social Security benefits currently cost substantially more than projected in 1983 and the gap between projection and reality is expected to grow somewhat over time. In 1983, the Social Security Trustees’ intermediate projection was for benefits and administrative costs to amount to 9.90 percent of taxable payroll in 2005 (see Table 2). Instead it cost 11.16 percent of taxable payroll – 13 percent more than forecast. Part of this difference is due to the large expansion in the disability rolls, far outpacing anything expected in 1983. But old-age and survivors insurance benefits are also larger than forecast for a variety of technical reasons.

<sup>5</sup> There are various definitions of “sustainable solvency.” The Social Security actuaries define it as a solvent trust fund for the 75-year window and a stable or rising trust fund at the end of the 75-year window. Other definitions emphasize a cash-flow surplus in the 75<sup>th</sup> year or solvency when measured over an infinite horizon.

The demographic outlook is slightly better than what the Trustees expected in 1983. As shown in Table 2, there are fewer aged Americans for each working age American than was expected two decades ago although between 1983 and 2007 the Trustees did not revise their long-term expectations for this ratio.

| <b>Table 2. Key Social Security Indicators</b> |                            |                        |
|--|----------------------------|------------------------|
|  | Actual / Latest Projection | 1983 Projection (II-B) |
| <b>2005</b>                                    |                            |                        |
| OASDI Cost Rate                                | 11.16                      | 9.90                   |
| OASDI Income Rate                              | 12.71                      | 12.79                  |
| Trust Fund Ratio                               | 318                        | 372                    |
| Covered Workers                                | 159,081                    | 153,926                |
| OASI Beneficiaries                             | 39,961                     | 41,620                 |
| DI Beneficiaries                               | 8,172                      | 5,878                  |
| Covered Workers Per Beneficiary                | 3.31                       | 3.24                   |
| Population 20-64                               | 181,063                    | 171,436                |
| Population 65+                                 | 37,147                     | 37,861                 |
| Aged Dependency Ratio                          | 0.205                      | 0.220                  |
| <b>2060</b>                                    |                            |                        |
| OASDI Cost Rate                                | 17.67                      | 15.44                  |
| OASDI Income Rate                              | 13.29                      | 13.17                  |
| Trust Fund Ratio                               | -520*                      | 54                     |
| Covered Workers                                | 201,387                    | 162,960                |
| OASI Beneficiaries                             | 86,747                     | 74,308                 |
| DI Beneficiaries                               | 14,252                     | 7,155                  |
| Covered Workers Per Beneficiary                | 1.99                       | 2.00                   |
| Population 20-64                               | 219,357                    | 180,213                |
| Population 65+                                 | 87,153                     | 71,913                 |
| Aged Dependency Ratio                          | 0.399                      | 0.399                  |

\*Author's estimate.

Source: Social Security Trustees, 1983 and 2007 Annual Reports and author's estimate.

### **Uncertainty in the Social Security Outlook**

The Social Security Trustees forecast three scenarios: a more pessimistic one, a more optimistic one, and an intermediate forecast. In the pessimistic scenario, for example, the Trustees assume a combination a simultaneously

adverse outcome for all of the variables they forecast, including economic, demographic, and technical variables. The range of uncertainty is enormous. In the more optimistic scenario a payroll tax rate of 13.4 percent, just slightly higher than today's 12.4 percent rate, is sufficient to pay for benefits in 2075. In the more pessimistic scenario, paying for benefits would require doubling the payroll tax rate to 25.4 percent.<sup>6</sup> CBO's forecast shows similar uncertainty, with the 80 percent confidence interval for pay-as-you-go tax rates in 2075 ranging from approximately 14 to 25 percent.<sup>7</sup>

The uncertainty in both sets of projections is derived from stochastic models that assume fixed and known parameters. The uncertainty about the parameters and the exact model is itself likely to be a significant source of variations that are not captured in the models themselves. One indication of the large magnitude of this structural and modeling uncertainty is the gap between the CBO and Trustees forecasts themselves: CBO's best guess forecast is itself in the tenth percentile of the stochastic variations shown by the Social Security Trustees.

The experience of past Social Security forecasts also provides a motivation for believing the current range of uncertainty is a reasonable, if not overly optimistic, gauge of our certainty about the future. For example, some credible demographers believe that life expectancy improvements will outpace even the Trustees optimistic forecast.<sup>8</sup> Fertility itself is extremely difficult to forecast, especially since the past century has seen such large and even in retrospect inexplicable variations over time. In recent years, for example, the Social Security Trustees have consistently forecast declines in fertility rates that have failed to materialize. In some cases, the actual fertility rate fell outside even the optimistic-pessimistic range in the forecast just ten years earlier.

### *Sources of Social Security's Future Uncertainty*

The principal driver of the uncertainty about Social Security's future is demographic uncertainty. Based on an analysis of the Trustees' forecast, varying the pessimistic and optimistic assumptions about fertility, mortality, and immigration – and keeping all of the other assumptions constant – would result in a variation in the pay-as-you-go payroll tax rate in 2080 from about 14 percent to about 24 percent. That is nearly all of the uncertainty between their pessimistic and optimistic scenarios.

As shown in Table 3, CBO's analysis also places demographics, specifically fertility, at the top of the list of drivers of uncertainty.

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<sup>6</sup> Social Security Trustees, 2007, *Annual Report*.

<sup>7</sup> CBO, 2005, "Quantifying Uncertainty in the Analysis of Long-Term Social Security Projections." CBO reports the deficit as ranging from 0.68 to 4.22 percent of GDP in 2075 but does not report the range as a share of taxable payroll.

<sup>8</sup> For a survey of longevity forecasts see Hilary Waldron, 2005, "Literature Review of Long-Term Mortality Projections," *Social Security Bulletin* Vol. 66, No. 1.

| <b>Table 3. Sources of Uncertainty in CBO Projection for 2100</b> |  |
|---|--|
| <b>Variable Varied in the Simulation</b>                          | <b>Variations in Deficit as a Share of GDP between 10<sup>th</sup> and 90<sup>th</sup> Percentile Outcomes</b> |
| Fertility   | 3.35   |
| Total factor productivity   | 1.60   |
| Mortality   | 0.81   |
| Gap in core price index & CPI-W                                   | 0.81   |
| Other economic variables  | 0.53   |
| Immigration   | 0.49   |
| Growth in non-wage compensation                                   | 0.42   |
| Disability incidence  | 0.21   |

Source: CBO, 2005, "Quantifying Uncertainty in the Analysis of Long-Term Social Security Projections"

This ranking is significant because to the degree that recent policy proposals have incorporated any element of "robust solvency" it is longevity indexing. But longevity appears to be a much smaller driver of future uncertainty than variations in fertility rates.

Past forecasts of demographic variables give some indication of future uncertainties. In 1935 the Committee on Economic Security submitted its Report To the President recommending a sweeping set of reforms, including the establishment of an old-age security program that eventually became Social Security. In order to evaluate the long-term prospects of such a program, the Committee presented demographic projections through the year 2000. They predicted that the population would grow to 151 million Americans by 2000 of which 19 million would be 65 or older.<sup>9</sup> The actual U.S. population in 2000 was nearly twice as large as the projection made 65 years earlier. In retrospect, the Committee's actuaries vastly underestimated fertility (understandably failing to foresee the baby boom), the sustained improvements in life expectancy and the continued increase in immigration. Astoundingly, for the purposes of Social Security, these errors were all offsetting. The Committee predicted that the ratio of aged Americans to working age Americans would reach 0.208 in 2000 – which turned out to be exactly correct.<sup>10</sup> Nevertheless, this forecasting feat should not be entirely reassuring because it was the result of two major and uncorrelated errors.

<sup>9</sup> Committee on Economic Security, 1935, "Report to the President." Available at: <http://www.ssa.gov/history/reports/ces/ces.html>.

<sup>10</sup> Some have pointed to this as evidence that Social Security has had no unforeseen demographic challenges. While this is true enough, it is also the case that the initial Social Security program was expected to have large and growing deficits by the year 2000. The program was not initially designed to cope with the projected demographic changes and later redesigns have only imperfectly modified it to cope with these changes.

## Dependency Indexing

In a basic pay-as-you-go retirement system, taxes collected from current workers would exactly equal benefits paid to current retirees. This can be expressed in an equation:

$$\tau_t w_t L_t = b_t w_{t-1} R_t$$

where  $\tau$  is the payroll tax rate,  $w$  is the average wage,  $L$  is the number of workers,  $b$  is the replacement rate (expressed as a fraction of last period's wages), and  $R$  is the number of retirees. Transformed, this equation shows that the payroll tax rate is related to the replacement rate by the dependency ratio:

$$\tau_t (1 + g) = \left( \frac{R_t}{L_t} \right) b_t$$

where  $g$  is the growth rate for a generation.

The intuition for this equation is simple. Ignoring economic growth, if payroll taxes are 10 percent and there are 3 workers for every retiree, then it is possible to pay each retiree a benefit equal to 30 percent of their previous wages (the replacement rate). If the number of workers per retiree falls to 2, then to keep the system in balance it would be necessary to either raise the payroll tax rate to 15 percent or reduce the replacement rate to 20 percent.

The dependency ratio,  $\left( \frac{R_t}{L_t} \right)$ , itself depends on past variations in the fertility rate, immigration, and longevity. Any one of these variables may move somewhat erratically from year-to-year, but the dependency ratio itself evolves in a relatively stable manner over time, as shown in Figure 1.



## Figure 1. Dependency Ratio

(Population 65+ per population 20-64)

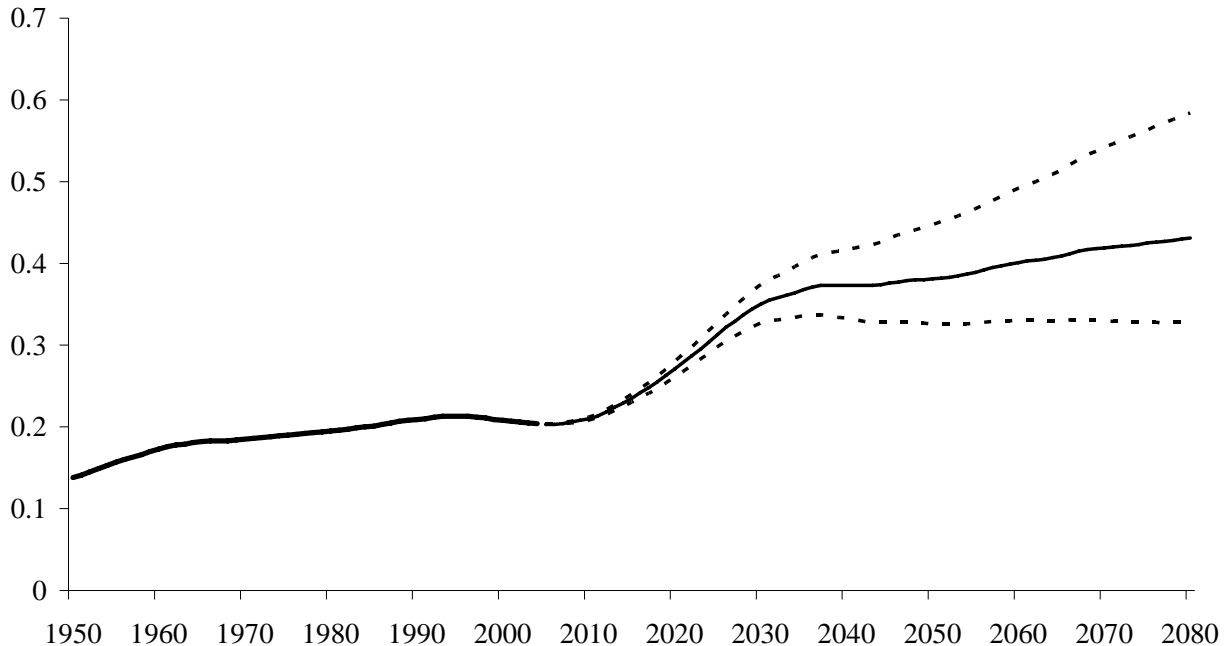


Figure 1 has a few important features. First, there is relatively little near term uncertainty in the dependency ratio. This is because it is largely a function of lagged fertility rates, for the near future the relevant people have already been born. Second, over time there is considerable uncertainty about the dependency ratio. By 2080, the optimistic dependency ratio is nearly 50 percent of the pessimistic dependency ratio – indicating a similar magnitude of variation in the feasible payroll tax rates or replacement rates. Third, the dependency ratio evolves in a smooth and, for the most part, monotonic fashion over time. This is important because one would not want to index benefits or taxes to a highly volatile and non-monotonic variable. This would introduce unnecessary uncertainty into the system and undermine some of the intergenerational risk sharing that Social Security aims to achieve.

This suggests that all else being equal, a reasonable policy would make either the payroll tax rate or the replacement rate a function of the dependency ratio. For the payroll tax this would be straightforward. Benefits could be indexed to the dependency ratio by adjusting the PIA factors used to calculate benefits as a function of past earnings based on changes in the dependency ratio.

As a technical matter, the timing of the indexing depends on whether one is indexing the payroll tax rate or the PIA factors. The payroll tax rate should depend on the contemporaneous dependency rate. In contrast, the PIA factors are used to determine benefits for a person's entire retirement. It would

make little sense to vary benefits from year to year in an unpredictable way. In theory, this means that the PIA factors should be based on a forecast of the average dependency ratio over the following two decades or so. In practice, however, this would not be feasible because Social Security's parameters can only be based on objectively observable and measurable variables, not on forecasts of future variables.

Note also that this mechanism is only well motivated for the retirement portion of Social Security. Disability benefits are not driven by the same demographic variables and conditioning on actual disability enrollments, which can vary greatly, would be problematic.

#### *Using Dependency Indexing To Address Solvency Directly*

Dependency indexing can be used to address the underlying solvency problem itself. Social Security is projected to be pay-as-you-go balance in 2017. The system would stay in rough balance if a combination of payroll taxes or PIA factors were set on the basis of the evolution in the dependency ratio. Unlike longevity indexing, which solves less than one-third of the underlying solvency problem, this would capture the major driver of the looming shortfalls: the decline in fertility rates following the baby boom generation.

For illustration, divide the payroll tax rate into a component for disability and survivor's insurance (set at 4.4 percent, roughly sufficient for permanent solvency) and another component for retirement benefits, initially 8 percent.<sup>11</sup> The tax rate for retirement benefits would vary after 2017 based on the change in the dependency ratio  $D$ . As a result, the payroll tax would be given by the following equation:

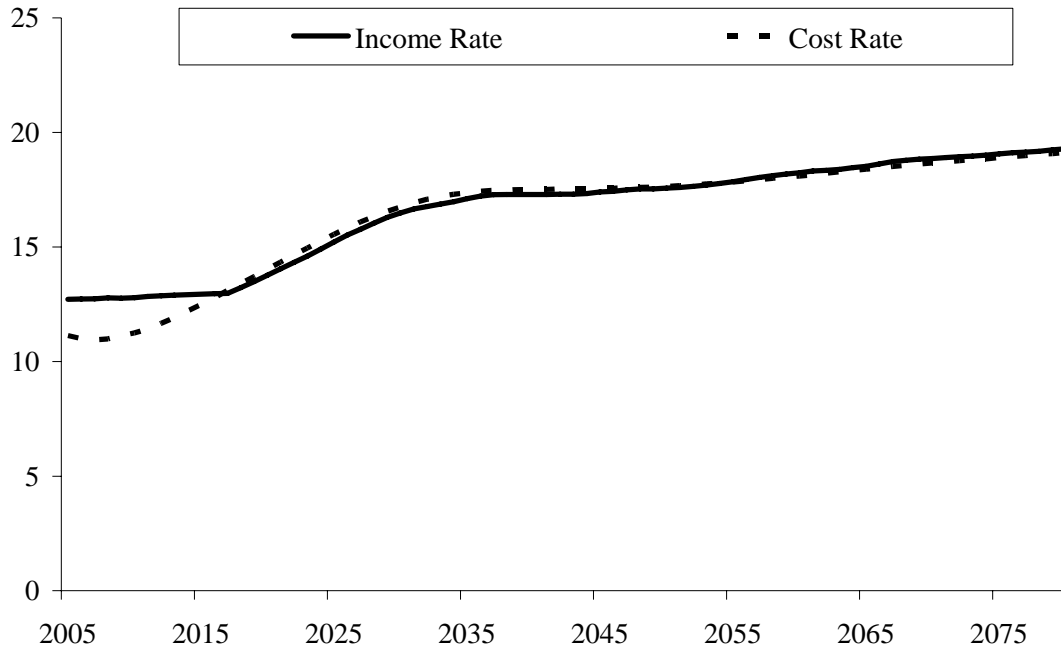
$$\tau_t = 4.4 + \left( \frac{D_t}{D_{2017}} \right) 8.$$

In the Trustees intermediate case, the cost and income rates would be balanced over the next 75 years, as shown in Figure 2.

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<sup>11</sup> This is not a proposal to segregate the trust funds in this manner, this is just a conceptual distinction.

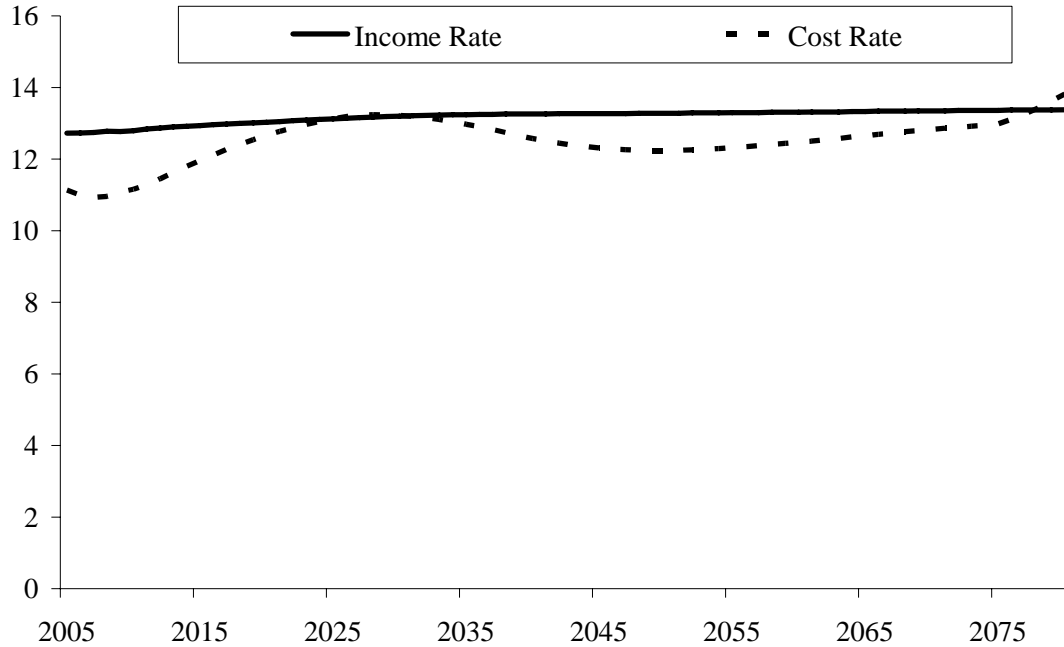
**Figure 2. Indexing the Payroll Tax Rate**



In this case, the dependency ratio provides a rationale for a sensible path of payroll tax rates. More importantly, this cash flow balance would be robust against alternative realizations of the key demographic variables.

Alternatively, a similar procedure could be applied to the PIA factors used to determine the initial Social Security benefit. Under current law, Social Security benefits are determined by a formula that adds up average wages in three "brackets": the lowest portion of wages is multiplied by 90 percent, the next portion is multiplied by 32 percent, and the highest portion is multiplied by 15 percent. All three of these could be gradually reduced overtime proportionately to the rise in the dependency ratio. Figure 3 shows the outcome.

**Figure 3. Indexing the Replacement Rate**



In this case, the fit is not nearly as close as in the payroll tax case for two reasons: the lag structure in the benefit formula and the fact that these changes are not adjusted to address the disability program. Nevertheless, the fit is still relatively close and minor technical adjustments could make it even closer. Dependency indexing the replacement rate is almost as robust as dependency indexing the payroll tax rate, although again slightly less robust because of the lags.

In addition, a combination of indexing payroll tax rates and benefit rates could be applied. The optimal solution is likely to involve some combination of the two. And the distribution could be altered by including an increase in the taxable maximum, raising additional taxes above the cap, or a more progressive distribution of benefit reductions. This basic framework, however, is very inflexible in the timing. In particular, relative to many of the plans that have been proposed, dependency indexing tends to lead to slower increases in tax rates and more abrupt reductions in benefits. Altering the intergenerational structure requires a slight variation in the framework.

#### *Delta Dependency Indexing To Ensure Robust Solvency*

Alternatively, suppose you already have a Social Security plan that achieves solvency under the Trustees best projections. This plan could be any combination of tax increases, benefit cuts, and retirement age increases – with or without private accounts. It is likely, however, that this plan does not achieve “robust solvency,” in that if the future is different from what we are currently

projecting the reform would either oversolve or undersolve the problem. In this case, “delta dependency indexing” can be added to the plan to make it more robust. In this case dependency indexing would be used to vary the tax rate insofar as the actual dependency ratios varied from the ones that were the basis of this reform. Again, applying this change only to the retirement portion of benefits:

$$\tau_t = \tau_{plan} * \left( \frac{D_t}{D_t^{forecast}} \right)$$

Similarly, for example, price indexing could be modified to a proposal that lowers the base PIA factors by 1.1 percent annually for 75 years. This base PIA factor would then be scaled up or down in proportion to the divergence of the dependency ratio from the value forecast in 2005.

In this way, “delta dependency indexing” can be grafted onto virtually any combination of tax and benefit changes or timing of changes to ensure that the overall result is more robustly solvent.

### **Discussion of Dependency Indexing**

Dependency indexing has a number of advantages. It addresses both the core underlying Social Security imbalance and the principal sources of uncertainty in that balance. It is relatively easy to explain and understand. And dependency indexing itself would be relatively simple to implement.

In addition, dependency indexing would not entail large variations in annual benefits or taxes. An alternative could, for example, only alter payroll tax rates when they varied by at least 0.2 percentage points to have longer periods of stability.

Dependency indexing does not, however, address all of the sources of uncertainty in Social Security. The principal remaining source of uncertainty is variations in the productivity growth rate, which determine real wage growth. One approach to address this uncertainty would be to index all retirement benefits to wages, not prices, even after the initial benefit. This would ensure that retirees shared in contemporaneous productivity growth. Because wages generally grow faster than prices, this would require a reduction in the initial Social Security benefit to ensure that the present value of benefits was not altered. This would also have the advantage of rising real benefits over the period of retirement, helping to smooth against the other sources of retirement income which generally are declining in retirement. Addressing this issue, however, is beyond the scope of this paper.

In addition, dependency indexing does not directly address the imbalances in disability insurance, including uncertainty about disability rolls. This, however, is not a significant drawback because the disability program itself is relatively small so that even large uncertainty about disability incidence translate into a relatively muted fiscal impact, as evidenced by CBO’s uncertainty analysis shown in Table 3.

The experience since 1983 indicates some of the possibilities and limits of dependency indexing. The large change in the Social Security outlook is a motivation for a reforms to incorporate considerations of robustness. But the fact that the 1983 demographic forecast was largely accurate, if somewhat on the overly pessimistic side, shows the limitations of the particular mechanism that is the subject of this paper.

### **Robust Social Security Reform and the Fiscal Gap**

The United States faces well-documented long-term budgetary challenges. According to the latest Congressional Budget Office (CBO) analysis, the primary budget deficit will grow from 1.1 percent of GDP in 2005 to 7.0 percent of GDP in 2050 under the scenario that roughly corresponds to the continuation of current tax policies.<sup>12</sup> Alan Auerbach, Jason Furman and William Gale (2007) estimate that over an infinite horizon, the immediate increase in taxes as a share of GDP required to stabilize the debt-to-GDP ratio ranges from 6 to 9 percent of GDP.<sup>13</sup> Social Security is responsible for less than one-fifth of this fiscal gap. The remainder is largely accounted for by Medicare and Medicaid, principally the assumption that medical spending will continue to outpace the growth of the economy, driving up the costs of both Medicare and Medicaid.

Future medical costs are, however, even more uncertain than Social Security costs. Even today, with the expensive prescription drug benefit and several rounds of Medicare “givebacks,” projected Medicare costs are below the levels forecast just a decade ago.

Robust Social Security reform will address only a small part of this uncertainty. Extending the principle to Medicare could address the demographic portion of the uncertainty in Medicare. But further extensions to incorporate uncertain medical spending would be challenging if not impossible.

### **Conclusion**

Dependency indexing is motivated by political economy concerns. In a world with no fixed costs to undertaking Social Security reforms future policymakers could, in an ad hoc way, adjust taxes or benefits to ensure that Social Security remains solvent in the even of any shock. In world of fixed costs to political decision making and sub-optimally delayed stabilizations<sup>14</sup>, there is a large advantage to getting the default right. If policymakers do not like the combination of taxes and benefits that result from the dependency indexing formula they can always pass new legislation to change it.

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<sup>12</sup> CBO, 2005, *The Long-term Budget Outlook*.

<sup>13</sup> Alan Auerbach, Jason Furman and William Gale, May 21, 2007, “Still Crazy After All These Years: Understanding the Budget Outlook,” *Tax Notes*.

<sup>14</sup> Alberto Alesina and Allan Drazen, 1991, “Why Are Stabilizations Delayed?” *American Economic Review* Vol. 81, No. 5.

Perhaps an even more important implication of dependency indexing is to overcome one of the sources of resistance to undertaking Social Security reforms today: the idea that it is better to wait and get the reform right than to act on the basis of earlier and less certain information. Alan Auerbach and Kevin Hassett formalize this intuition in a model which assumes that budgetary policies can only be changed once in a generation.<sup>15</sup>

Dependency indexing can overcome some of this inertia. For example, some skeptics about the need for Social Security reform have argued that the Social Security Trustees have underestimated future immigration. They claim that with higher immigration (especially illegal immigration which results in higher payroll tax collections without higher benefit payments) Social Security's solvency problems would be considerably smaller. If dependency indexing were proposed, the proper response to such a claim would be "well, if you are correct then the benefit reductions would automatically be much smaller."

At a minimum, future research and policy proposals should take "robust solvency" more seriously and the Social Security actuaries should include information that makes it possible to evaluate the robustness of alternative approaches to restoring solvency.

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<sup>15</sup> Alan Auerbach and Kevin Hassett, August 2002, "Optimal Long-Run Fiscal Policy: Constraints, Preferences and the Resolution of Uncertainty." Note that if future policy stickiness is asymmetric – that is it is easier to raise benefits and/or cut taxes than *vice versa* it might be optimal to over-solve the problem today.