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ABSTRACT

The Social Security trust fund will be exhausted in the early 2030s. The U.S. government will need to make a choice about how to address the impending trust fund exhaustion, but it is unclear what it will choose to do. This indecision leaves young and middle-aged workers not knowing whether they will face Social Security benefit cuts, payroll tax increases, or an increase in the full retirement age. This uncertainty about what will happen in the future causes young and middle-aged cohorts who are saving for retirement to make mistakes that could be avoided if the government decided earlier what will happen when the trust fund runs dry. This paper examines the cost of government indecision on Social Security reform. We calculate the value that people in different income classes and different birth cohorts would receive if the government decided now what it will do when the trust funds are exhausted. We find that the cost of indecision can be large. In some cases, the value of knowing today what the policy change will be in 2035 is worth more than two months of labor market earnings.

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I. Introduction

Social Security is the primary source of retirement income for many Americans. The Social Security Administration (2020) estimates that around half of married couples and 70 percent of singles receive at least half their retirement income from Social Security. The importance of Social Security is even greater for a significant minority of households: 21 percent of married couples and 45 percent of singles receive at least 90 percent of their retirement income from Social Security.

Most realistic estimates suggest that the Social Security trust fund will be exhausted by the early-to-mid 2030s.[1] Current law specifies that when the trust fund is exhausted, benefit payments must be restricted to available revenue. Options to accomplish this include cutting benefits across the board or delaying benefit payments.[2] The Social Security Trustees estimate that in 2035, the year in which they project the trust fund to be depleted, revenues will be sufficient to cover 79% of promised benefits (OASDI Board of Trustees 2020). However, some policy change is likely to be undertaken either before or at this date. Frequently discussed options include cutting benefits in a way that increases the system's progressivity, or raising payroll taxes, either across the board or at higher income levels. The funding shortfall could also be financed by issuing more debt, which could delay the tax increases or benefit cuts required to restore solvency to the system, perhaps beyond the lifetimes of today's adults.

Each of these policy options has direct implications for Americans' financial well-being. For example, our simulations suggest that an increase in the Full Retirement Age (FRA) to 70 costs an

[1] For example, the 2020 Social Security Trustees Report – which did not take into account the impact of the COVID-19 pandemic – projected that the trust funds for the retirement and disability programs would be exhausted in 2035 (OASDI Board of Trustees 2020). Similarly, the Congressional Budget Office's (2019) Long Term Budget Outlook projected a trust fund depletion date of 2032 for the retirement program. Reflecting the impact of the COVID-19 pandemic, the Congressional Budget Office's September 2020 estimate moved that depletion date to 2031 (Congressional Budget Office 2020), while the Gladstone and Akabas (2020) presented alternative scenarios with depletion dates as early as 2026. More recently, however, the Congressional Budget Office (2021) returned to its projection of a 2032 trust fund depletion date for the retirement program, reflecting stronger than anticipated economic growth.

[2] Huston and Morton (2019) provide a review of the legal issues and payment options.

average-earning woman $123,942 if she was born in 1970, and $147,750 if she was born in 1990. Other reforms have different distributional impacts across income groups and birth cohorts. The direct cost of the reforms required to close Social Security's financial shortfall is unavoidable. It can be distributed across different income groups and birth cohorts, but it must be paid sooner or later. In contrast, the main focus of our paper is on a cost that is entirely avoidable: the cost of government indecision regarding which reform to implement. That indecision creates uncertainty for young and middle-aged workers who are planning for retirement. An individual who assumes that a particular reform will occur – and is surprised by a different reform – has made a costly mistake. Knowing in advance which reform will be implemented allows for better planning and therefore has value. The government could resolve that indecision by deciding today what steps it will take to close Social Security's shortfall.

We aim to calculate the value of having accurate information about which Social Security reforms will be implemented in the future. We measure the value of early awareness by calculating the amount of money an individual requires at the policy start date to compensate for not knowing the policy in advance. That amount depends on an individual's birth cohort, gender, and earnings profile. For example, consider a woman born in 1975 with average earnings who plans for no policy changes but is surprised by a 20% cut in Social Security benefits in 2035. Now suppose the government instead announced in 2020 that the 20% benefit cut would occur 15 years in the future. We find that the value of becoming aware of the policy 15 years in advance is approximately $8,964 (measured in 2020 dollars) or about 1.52 times her average monthly earnings. This awareness value is distinct from the cost of the policy itself. The new policy – the 20% cut in benefits – directly reduces the individual's benefits by an annuitized equivalent of $128,106. However, if the policy remains in flux until it is actually implemented – and the individual operates under the mistaken assumption that there will be no change – then there is an additional indecision cost of $8,964. Although the early awareness value is modest compared to

the direct impact of the reform, we emphasize that this cost is entirely avoidable (unlike the direct cost of the reform, which can only be redistributed).

A growing body of research examines how uncertainty over the form or timing of Social Security reforms affects the well-being of younger individuals (Gomes, Kotlikoff, and Viceira 2012, Benítez-Silva, Dwyer, and Sanderson 2006, Bütler 1999, Kitao 2018, Nelson 2019, and Caliendo, Gorry, and Slavov 2019). The contribution of this chapter is to model the cost of indecision about specific, realistic reform plans in a simple and transparent way, providing illustrative calculations that can be helpful to individuals, financial planners, and policy makers. Individuals and financial planners can use the information to determine which mistakes are most costly, or to rank changes that are most critical. Knowing the cost of indecision can prompt policy makers to act sooner to avoid that cost. Moreover, it can allow policy makers to assess the value of agreeing to a reform plan now versus hoping for a future political path to a more preferred reform. It can also help policy makers understand which types of indecision are most costly and how those costs are distributed across income groups and cohorts.

II. Current Law and Reform Options

a. Current Law

Social Security benefits are based on the average of the highest 35 years of earnings, indexed for economy-wide average wage growth through age 60. (Additional years of earnings count at their nominal value.) This measure, converted to a monthly amount by dividing by 12, is called Average Indexed Monthly Earnings (AIME). Monthly benefits are based on applying a progressive formula to AIME. That formula establishes two bend points, or thresholds, for AIME. If benefits are claimed at full retirement age (FRA, equal to 67 for the stylized individuals in our model), monthly Social Security benefits are 90% of AIME below the first bend point, 32% of AIME between the first and second bend points, and 15% of AIME above the second bend point. This amount is known as the primary insurance

amount (PIA).[3] Cost of living adjustments are applied to PIA after age 62. These cost-of-living adjustments are based on the consumer price index for urban wage earners and clerical workers (CPI-W). Social Security taxes are based on covered earnings, or earnings below a taxable maximum (the "cap") that is also indexed for economy-wide wage growth. The total (employer plus employee) payroll tax rate for old age and survivors insurance (OASI) is 10.6%. Actuarial adjustments are applied to PIA to determine the monthly benefit amount for claims made either before (as early as 62) or after (as late as 70) full retirement age. For individuals in our model, claiming at age 62 results in a monthly benefit equal to 70% of PIA, and delaying to age 70 results in a monthly benefit equal to 124% of PIA.

What does this mean for Social Security benefits in dollar terms? To answer this question, we turn to the stylized earnings profiles that we use throughout this analysis. We construct these earnings profiles using the 2016 Outgoing Rotation Groups file from the Center for Economic Policy Research's Uniform Current Population Survey (CPS) Extracts. This dataset contains a consistent hourly wage variable (rw_ot) for each worker. (The construction of this hourly wage measure is detailed in Schmitt 2003.) To obtain a measure of full-time annual earnings, we multiply this hourly wage measure by 2,000. We then calculate the mean, 10th, and 95th percentiles of earnings at each age. This gives us the 2016 age-earnings profile for three groups: low-income (10th percentile), average (mean), and high-income (95th percentile). A worker whose earnings are in the 95th percentile at each age exceeds the taxable maximum starting in his or her late 30s. We divide each of these earnings profiles by the mean economy-wide earnings level (across all observations in the dataset). This gives us an age-earnings profile for each group relative to the economy-wide average in 2016. These relative age-earnings

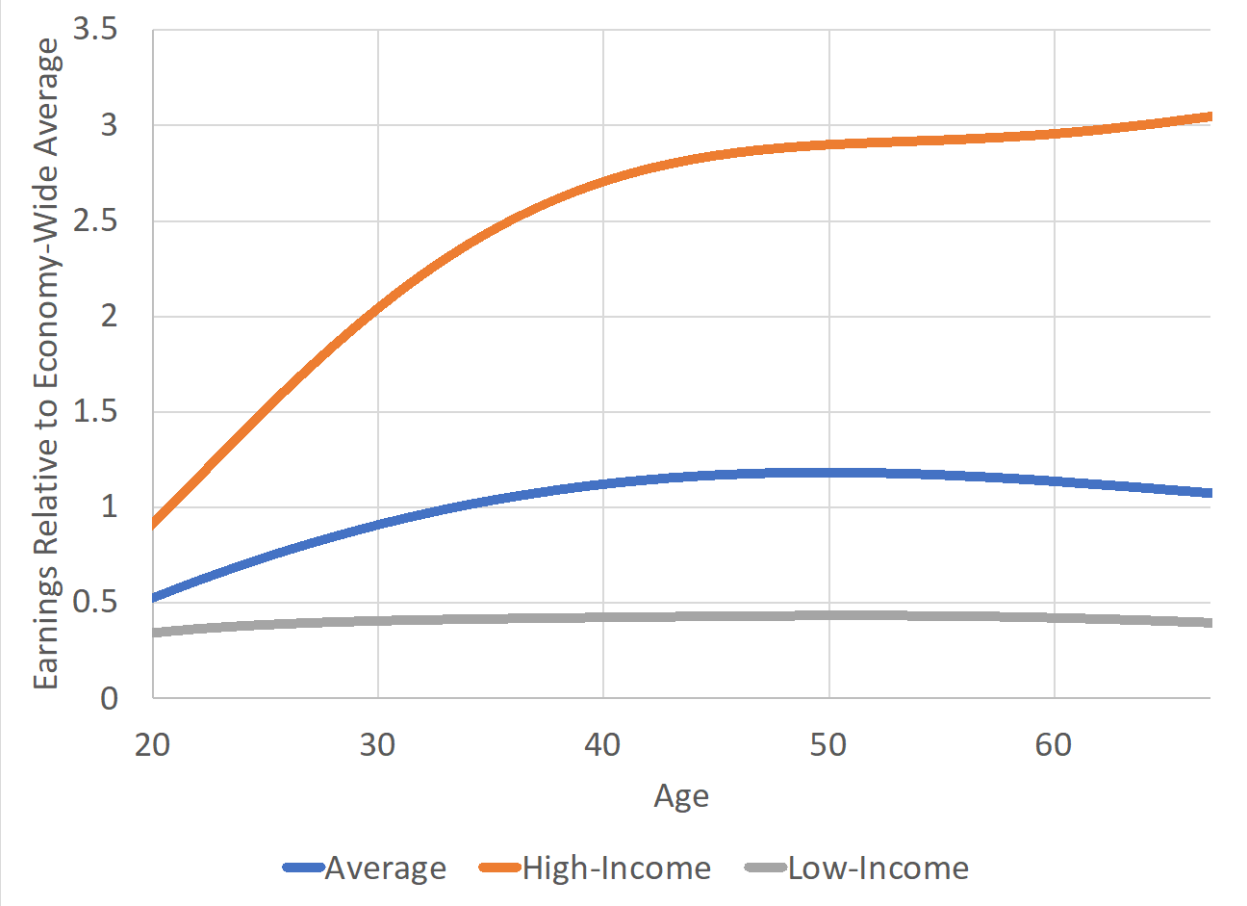
[3] The bend points in the PIA formula are indexed for economy-wide average wage growth. AIME and PIA are calculated during the year in which the worker turns 62, using the bend points that are in effect for that year; however, they can be subsequently updated to reflect additional years of work. In 2020, the bend points (applying to workers who turned 62 in 2020) were $960 and $5,785, and the taxable maximum was $137,700.

profiles are not smooth, so we fit a 5th degree polynomial to obtain the predicted relative wage at each age. The relative age-earnings profiles are shown in Figure 1.

We simulate the experience of stylized workers in multiple birth cohorts multiplying the predicted relative wage at each level by the Social Security average wage index (AWI) for that year.[4] Thus, each worker's wage growth over his or her lifetime incorporates both relative shifts due to aging and economy-wide wage growth. We use the historical values of AWI for years 1951—2018 and forecast subsequent years assuming a 3% growth rate. Using the wage profile and AWI, we estimate a worker's AIME. Note that Social Security's taxable maximum wage is a function of AWI, as are the bend-points of the PIA formula. Hence, the wage profile and AWI are sufficient to calculate nominal wages, PIA, and the nominal Social Security benefit a worker receives at any claiming age. Nominal wages and benefits are converted to real dollars using the CPI-W and reported as 2020 dollars. It is important to note that while these stylized earnings profiles are intended to allow simple illustrations about the cost of government indecision, they do not capture all the realities of individual labor market experiences such as differences in hours worked or labor force participation.

Figure 1: Relative Age-Earnings Profiles

[4] This assumption abstracts from the possibility that the earnings of different income groups may grow faster or slower than the economy-wide average. In particular, it abstracts from growing earnings inequality driven by faster growth at the upper end of the earnings distribution.



Notes: Authors' calculations based on 10th, mean, and 95th percentile earnings in CEPR's CPS Outgoing Rotation Group Extracts.

Table 1 shows monthly Social Security benefits – based on these earnings profiles – for the stylized workers in our model under alternative claiming ages. All values are denominated in 2020 dollars. There are four important aspects of these values. First, monthly benefits are modest. Among workers in the 1975 birth cohort who retire at the FRA, the monthly benefit is $1,356 for workers at the 10th percentile of the earnings distribution, $2,542 for workers at the mean, and $3,756 for workers at the 95th percentile. Second, although the progressive AIME formula means that low-income workers see a larger proportion of their earnings replaced by Social Security than high-income workers do, high-income workers enjoy substantially greater Social Security benefits in absolute dollar terms. Third,

promised Social Security benefits (setting aside potential future benefit cuts) have risen across cohorts for workers at all income levels. Among workers at the 10th percentile who claim at age 62, the expected monthly benefit has risen from $811 for the 1960 birth cohort to $1,088 for the 1990 birth cohort; among workers at the 95th percentile who claim at age 70, benefits have risen from $4,072 to $5,473. Finally, workers who are able to delay claiming to 70 receive benefits nearly twice as great as those who claim at age 62. Delayed claiming – for those who can afford to wait – is a strong strategy for improving retirement security (e.g., Shoven and Slavov 2014).

Table 1: Monthly Social Security Benefit by Claiming Age

Birth Year	Claim at 62	Claim at FRA	Claim at 70
	Low-Income		
1960	$811	$1,171	$1,465
1965	$852	$1,230	$1,538
1970	$895	$1,292	$1,615
1975	$940	$1,356	$1,696
1980	$987	$1,424	$1,781
1985	$1,036	$1,495	$1,870
1990	$1,088	$1,570	$1,964
	Average-Income		
1960	$1,485	$2,196	$2,778
1965	$1,559	$2,306	$2,916
1970	$1,638	$2,421	$3,063
1975	$1,720	$2,542	$3,215
1980	$1,806	$2,670	$3,376
1985	$1,896	$2,803	$3,546
1990	$1,991	$2,943	$3,723
	High-Income		
1960	$2,207	$3,235	$4,072
1965	$2,324	$3,406	$4,287
1970	$2,440	$3,577	$4,503
1975	$2,562	$3,756	$4,727
1980	$2,690	$3,942	$4,963
1985	$2,826	$4,141	$5,212
1990	$2,967	$4,349	$5,473

Notes: Authors' calculations based on wage profiles in Figure 1 (10^{th}, mean, and 95^{th} percentile earnings) and Social Security benefit rules.

b. Reform Options

We consider a range of potential changes to benefits and taxes, and we assume that these changes go into effect in 2035 when the trust fund is exhausted.[5]

(1) Issue debt (DBT): This option implies that our stylized workers escape reform. Any tax increases or benefit cuts are passed on to future generations.

(2) Across-the-board benefit cut (CUT 20.0%): In this scenario, benefits are cut by 20% across the board once the trust fund is depleted in 2035.

(3) Increase full retirement age to 70 (FRA 70): In this scenario, an individual can receive their PIA only if they claim at age 70. Actuarial reductions are applied for earlier claims. We assume that any benefits claimed early before age 70 are reduced based on the current formula (by 5/9 of 1% for each month up to 36 months, and by 5/12 of 1% for each additional month). We apply this change to any individual claiming Social Security benefits in or after 2035.

(4) Switch to chained CPI (C-CPI-U): In this scenario, the cost-of-living adjustment (COLA) for benefits is calculated using the chained CPI, which grows more slowly than the CPI-W.

(5) Across-the-board payroll tax increase (no change to cap) (TAX+3.1%): In this scenario, the payroll tax is increased by 3.1% of taxable wages. The taxable maximum remains unchanged.

(6) Increase progressivity of PIA formula (PIA 5.0%): In this scenario, the benefit formula is altered to pay 5% (versus 15%) of AIME above the second bend point. This change cuts benefits only for high earners.

[5] Many of these reforms are based on the options available at the Congressional Budget Office's online calculator, https://www.cbo.gov/publication/54868.

(7) Remove the payroll tax cap (CAP 10.6%): In this scenario, the taxable maximum ($137,700 in 2020) is no longer in effect, and all earnings above the current maximum are subject to a 10.6% payroll tax. No additional benefits are paid on these earnings.

Individually, many of these reforms do not restore actuarial balance, though there are various combinations that do. In the analysis below, we assume that the government issues debt to finance the remainder of the shortfall (and that the tax increases or benefit cuts necessary to pay off the debt occur after our stylized workers die).

c. Effect of Reform on Individual Benefits

Setting aside option 1 – issuing debt – each of these reforms either reduces an individual's Soccial Security benefits (options 2, 3, 4, and 6) or increases her pre-retirement taxes (options 5 and 7). Reforms 2 through 5 affect individuals across the board. Reforms 6 and 7 target high-income individuals. To calculate the impact of each reform on individuals, we project lifetime Social Security benefits for the individuals in Table 1 using the historical values of CPI-W for years 1974—2019 and forecast subsequent years assuming a 2% growth rate. We model chained CPI or C-CPI-U as CPI-W less 0.25%. Nominal wages and benefits are converted to real 2020 dollars using CPI-W. To calculate the present value of these benefit streams, individuals are assigned the mortality rates for their gender and birth cohort based on the cohort mortality tables underlying the intermediate projections in the 2013 Social Security Trustees Report.[6] The risk-free interest rate is set to 0%, reflecting the persistent low real interest rates experienced during the past decade.

[6] In reality, mortality varies by income level (see, e.g., Chetty et al. 2016). Adjusting mortality by income level would lower the lifetime value of Social Security benefits – as well as any changes to benefits – for low earners relative to higher earners. However, we would not expect it to affect our main finding that the cost of indecision is significant for those planning for retirement.

Table 2 shows the reduction in lifetime benefits, or the increase in the lifetime taxes (both discounted to the present), for stylized workers at different levels of earnings under reform options 2 through 7. The table shows results for women; results for men are similar but slightly lower due to higher male mortality. The 20% benefit cut has the largest impact on the present value of benefits: a low-income woman born in 1990 would need an extra $79,000 today to make up for a 20% cut in Social Security, while her high-income counterpart would need an extra $218,000 today. Bhutta et al. (2020) report that median net worth was $121,700 in 2019, and that mean retirement savings among individuals with employer-sponsored defined contribution pensions or individual retirement accounts was $269,600. Compared to these amounts, the impact of cutting Social Security benefits across the board is large.

Table 2: Impact of Reform on Present Value of Benefits and Taxes

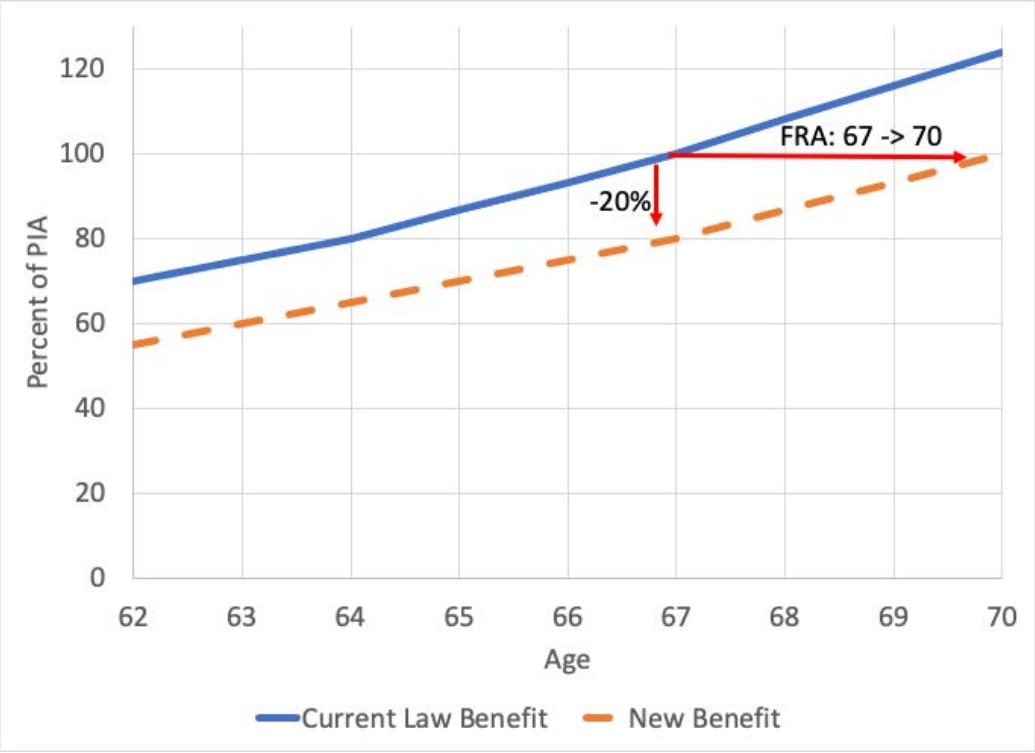
Birth Year	CUT 20.0%	FRA 70	C-CPI-U	TAX+ 3.1%	PIA 5.0%	CAP 10.6%
			Low-Income Female			
1960	$42,087	$0	$4,962	$0	$0	$0
1965	$55,999	$0	$7,958	$0	$0	$0
1970	$66,022	$66,102	$11,982	$1,583	$0	$0
1975	$68,335	$68,371	$14,104	$5,738	$0	$0
1980	$71,380	$71,348	$14,823	$10,175	$0	$0
1985	$74,854	$74,795	$15,638	$14,842	$0	$0
1990	$78,844	$78,871	$16,567	$19,737	$0	$0
			Average-Income Female			
1960	$78,957	$0	$9,309	$0	$0	$0
1965	$104,984	$0	$14,919	$0	$0	$0
1970	$123,781	$123,942	$22,464	$4,334	$0	$0
1975	$128,106	$128,106	$26,440	$15,676	$0	$0
1980	$133,842	$133,777	$27,795	$27,836	$0	$0
1985	$140,351	$140,351	$29,321	$40,717	$0	$0
1990	$147,803	$147,750	$31,057	$54,241	$0	$0
			High-Income Female			
1960	$116,311	$0	$13,713	$0	$93,470	$0
1965	$155,038	$0	$22,032	$0	$125,631	$0
1970	$182,869	$182,789	$33,188	$9,904	$148,327	$7,203
1975	$189,245	$189,281	$39,058	$35,083	$153,476	$23,993
1980	$197,666	$197,666	$41,049	$61,234	$160,208	$39,895
1985	$207,345	$207,374	$43,317	$88,464	$168,216	$55,610
1990	$218,361	$218,361	$45,883	$117,117	$177,060	$70,809

Notes: Authors' calculations. Figures based on female mortality rates. Figures for males are similar and available upon request.

Raising the FRA to 70 is similar to a 20% benefit cut, in the sense that both policies have an almost identical impact on affected individuals who claim at the full retirement age. The reason for this result is illustrated in Figure 2. The solid line shows the relationship between monthly benefit and claiming age under current law. Individuals claiming at age 62 get 70% of PIA, individuals claiming at the FRA (67) get

100% of PIA, and Individuals claiming at age 70 get 124% of PIA. Increasing the FRA to 70 implies that the "full" benefit – 100% of PIA – could be claimed only at age 70. This change is depicted by the horizontal arrow. Benefits are then reduced according to the actuarial formula, depicted by the dashed line, which shows that the benefit payable to age 67 claimers is 80% of PIA. A 20% across-the board-benefit cut reduces benefits at every claiming age by 20%. This change is depicted by the vertical arrow. For age 67 claimers, therefore, the 20% benefit cut results in the same monthly benefit as increasing the FRA to 70. Thus, for affected cohorts (born in 1970 and later), the impact of raising the FRA is almost identical to the impact of cutting benefits by 20%. Cohorts born in 1960 and 1965 are unaffected by an increase in the FRA, as they will have retired by 2035.

Figure 2: Raising the FRA to 70 is Equivalent to Cutting Benefits by 20% for Cohorts Born in 1970 and Later



Notes: Authors' depiction based on Social Security benefit rules.

Table 2 also illustrates that the impact of other reforms is smaller, and that tax increases have a disproportionate effect on younger cohorts while leaving older cohorts (who have already retired) unaffected. In addition, average and low earners are not affected by the policies that cut benefits or raise taxes for high earners.

The dollar amounts shown in Table 2 reflect the direct impact of the policies. In Section III, we examine the *additional* cost imposed on individuals when policy decisions are delayed.

d. Effect of Reforms on Social Security Solvency

These policies also have different impacts on the financial stability of the Social Security system. Table 3 shows the effectiveness of seven policies analyzed by the Congressional Budget Office in restoring the 75-year financial balance of the Social Security system. The seven CBO polices are not precisely the same as the policies we evaluate, but they are closely related.

Table 3: Effects of Social Security Reform Options on 75-Year Actuarial Balance as Percentage of GDP

Issue Debt (Do Nothing)	**-1.5%**
Cut Benefits by 20%	**0%**
Raise FRA to 70	**-1.1%**
Switch to Chained CPI	**-1.3%**
Increase Payroll Tax by 1% of Wages	**-1.2%**
Reduce Top PIA Factor to 5%	**-1.4%**
Impose Payroll Tax on Earnings above $250,000	**-0.5%**

Source: CBO calculator, available at https://www.cbo.gov/publication/54868, and OASDI Board of Trustees 2020. Assumes implementation in 2020 for changes to the benefit formula and 2023 for the FRA increase.

The first row of the table shows that the actuarial deficit of the Social Security system over the next 75 years is projected to be 1.5% of GDP over that period. The second row shows that an across-the-board 20% cut in benefits in 2020 would roughly eliminate the 75-year shortfall. Under this change, all current and future beneficiaries would immediately suffer a 20% reduction in benefits relative to current law. This policy was not scored by CBO, as it is not something any politician has advocated. However, we consider this option as a benchmark. The 2020 Social Security Trustees Report suggests that a 21% across-the-board benefit cut in 2035 would bring payable benefits in line with revenues for that year. While the benefit cut would need to be increased to 27% in the future to keep benefits in line with revenues, we would expect a 20% benefit cut to reduce the actuarial balance to close to zero. We also note the contrast with survey evidence, which suggests that individuals under the age of 35 anticipate getting only around half the benefits promised to them under current law (Liebman and Luttmer 2018). In other words, young workers are probably more pessimistic about their future Social Security benefit than the system's finances suggest.

Figure 2 showed that a 20% cut and an increase in the FRA to age 70 are essentially identical for new beneficiaries. However, raising the FRA to 70 is much less effective in closing the 75-year shortfall than an across-the-board 20% cut. The reason is that raising the FRA affects only new beneficiaries and leaves existing beneficiaries unaffected.

Switching to a chained CPI to calculate COLAs contributes a relatively small amount to alleviating the financial shortfall. Similarly, raising the payroll tax by 1% of wages is far from sufficient, but raising the rate by 3.1% would have a larger impact. The Social Security Trustees estimate that in 2035, the

program's costs will exceed income by about 3.4 percent of payroll, with the difference growing thereafter.

The sixth row shows that changing the progressivity of benefits by lowering the top PIA factor to 5% is relatively ineffective in solving the financial shortfall facing Social Security. There are three reasons for this. First, relatively few beneficiaries have an AIME greater than the second bend point (the only ones affected). Second, the conversion between AIME and PIA after the second bend point is already low (15%) and lowering it further does not reduce benefits much. And, finally, this policy would only affect new beneficiaries and not existing claimants, meaning that the total benefit reduction is not very large.

Imposing payroll taxes on earnings over $250,000 would close about two-thirds of the money shortfall, but only if there was not a corresponding increase in future benefits.

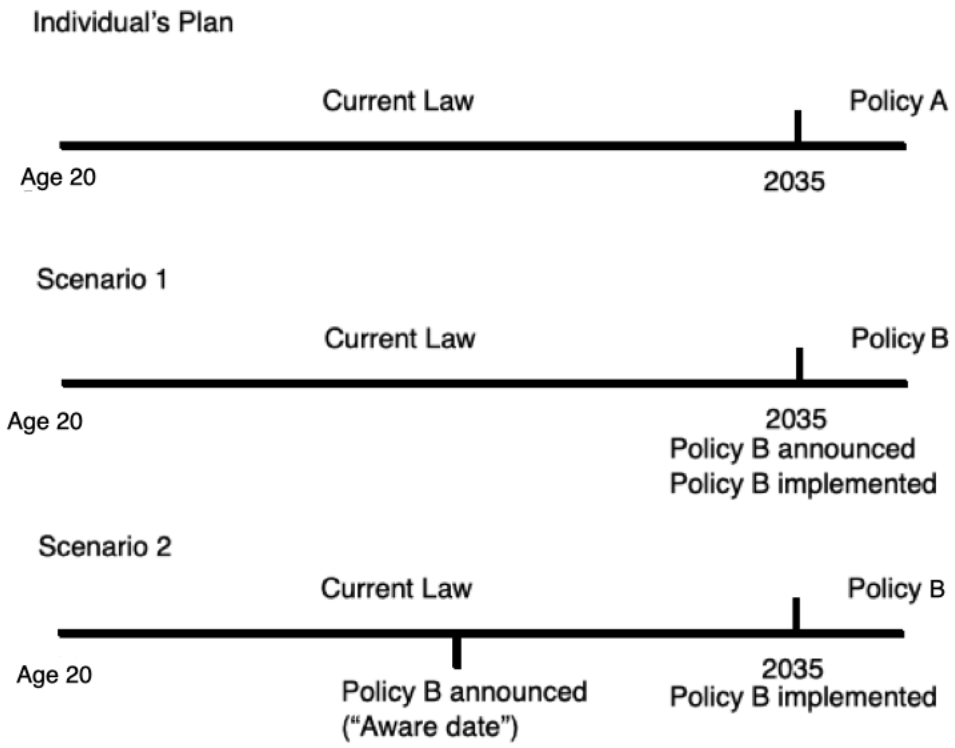
III. The impact of indecision

We turn now to the main analysis of this paper: quantifying the cost of policy indecision. To see the intuition behind our analysis, suppose an individual formulates a retirement plan under the assumption that no policy change will occur. However, she is surprised by a policy change in 2035. How does her well-being in this scenario compare to her well-being in an alternative scenario in which the policy change is announced – for example – 15 years in advance? In other words, what is the value of knowing about the policy change in 2020 versus 2035? This value is the cost to the individual due to government indecision. Alternatively, suppose an individual formulates a retirement plan under the assumption that benefits will be cut by 20% across the board in 2035. However, unexpectedly, the government decides to issue debt and pass the cost of any adjustment on to future generations. That is, the individual faces no benefit cut. Even though the surprise is a positive one from the individual's perspective, knowing about it ahead of time is valuable as it allows advance planning.

To be more specific, we consider an individual who uses a life cycle model at the start of her career (age 20) to formulate a financial plan based on a particular expectation about what will happen in 2035 when the trust fund is exhausted. We vary this expectation: in some cases, the individual assumes that there will be no change to current law benefits (debt will be issued to pay full benefits). In other cases, the individual assumes benefits will be cut. This baseline financial plan is represented in Figure 3 by the top timeline labeled "Individual's Plan." It shows that the individual's plan is formulated in 2020, and the plan assumes current law will be in place until 2035, after which it will be replaced with "Policy A." Policy A may be a continuation of current law, or it may be some alternative.

However, the individual's expectation turns out to be wrong. We consider two alternative scenarios. Under one scenario, the individual follows her plan and is surprised when a different policy – Policy B – is both announced and implemented in 2035. This scenario is represented by the second timeline in Figure 3, labeled "Scenario 1." In Scenario 1, the individual is surprised by Policy B in 2035 and must adjust her plans accordingly. Under the second scenario, the government announces in advance that Policy B will take effect starting in 2035. As soon as the announcement is made, our individual can adapt her plan to these impending changes. This scenario is represented by the third timeline in Figure 3, labeled "Scenario 2." In Scenario 2, the government announces at some date before 2035 that policy B will take effect in 2035. We refer to the date of this announcement as the "aware date." Once the announcement is made, the individual adjusts plans.

Figure 3: Alternative Timelines for Individuals Planning for Retirement



We compare the individual's well-being under Scenarios 1 and 2. For example, consider an individual who plans for no change to current law (in other words, Policy A is a continuation of current law). However, there is actually a 20% benefit cut (Policy B) starting in 2035. In Scenario 1, the individual does not learn of this change until 2035. In Scenario 2, she learns of the impending policy change ahead of time, perhaps in 2020 or 2025.

IV. Model

To model the value of this early awareness, we solve a standard life cycle model for stylized individuals from different birth cohorts and with different earnings profiles.[7] We assume individuals start work at age 20, retire and claim Social Security at age 67, and live for up to 110 years. Individuals choose each period how much to save and consume. There is no labor supply choice; that is, individuals

[7] Details of the model can be found in Scott et al. (2019).

work full time between ages 20 and 66 and are fully retired thereafter. Borrowing is restricted to one year of income. We assume individuals have a constant relative risk aversion (CRRA) utility function with a coefficient of relative risk aversion of 3. (To test sensitivity, we also consider alternative levels of risk aversion.) We assume a subjective discount rate for utility of 3%. Individuals earn the risk-free interest rate, zero percent, on any wealth. We consider workers in different cohorts with different lifetime earnings profiles, as introduced in Table 1, with Social Security benefits and mortality projected using the methodology underlying Table 2. We assume individuals retire and claim Social Security at 67.

We begin with a baseline in which individuals optimize under the assumption that there will be no changes to Social Security for the rest of their lives; that is, they assume that Policy A (in Figure 3) will reflect policy (1) from the list above, and the government will issue debt so that any cost of reform is passed on to future generations. Under Scenario 1 (see Figure 3), they are surprised in 2035 by one of the other reforms discussed above and must adjust their plan at that point. Under Scenario 2 (see Figure 3), they learn about the change in advance – at the "aware date." In this case, individuals can implement a new plan that anticipates the new policy. We calculate the amount of additional wealth ("compensating wealth") that – if received at the policy start date – would leave individuals indifferent between the scenario in which they are surprised and the scenario in which they know in advance (at the aware date) what change will occur. We also consider alternatives in which an individual assumes that a particular reform (e.g., a 20% benefit cut) will occur in 2035 and are surprised by either a different reform or no change. Again, we calculate the value of knowing the correct reform at the aware date.

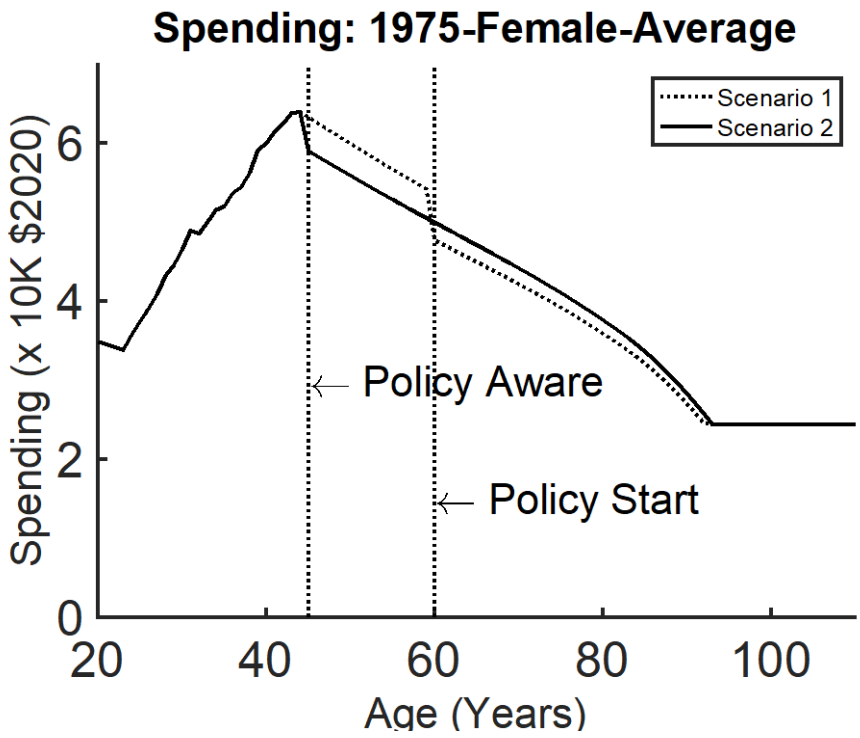
V. Results

a. Cost of Indecision When Individuals Assume No Change

We first consider an individual who assumes that no change will occur in 2035; in other words, the government will issue debt and pay all promised benefits. Figure 4 shows the path of spending for an

average income female born in 1975 who assumes that there will be no changes to Social Security during her lifetime. The first dotted vertical line indicates the year 2020, when the worker is aged 45. Past consumption (before age 45) is somewhat bumpy as we have assumed the economy-wide average wage grew in line with its historical levels; a smooth growth rate is assumed for the future. Starting at age 45, there are two possible scenarios. In Scenario 1, illustrated by the dotted line, the worker continues down the planned path and is surprised by a 20% benefit cut in 2035 (indicated by the second vertical dotted line labeled "Policy Start"). At this point, her consumption decreases, reflecting the lower benefits that she receives. In Scenario 2, illustrated by the solid line, the government announces in 2020 that benefits will be cut by 20% starting in 2035. In this case, the worker may be able to make an immediate adjustment. The ability to make an immediate adjustment hinges on whether the individual has already started saving for retirement – in which case saving can be adjusted in response to the announcement. Our stylized 45-year-old began saving for retirement in 2017 and is therefore able to adjust. Consumption drops in 2020 and continues along a smooth path even when the policy change occurs in 2035. This decrease in consumption is subsequently followed by an increase in savings to offset impending benefit cuts.

Figure 4: Annual Consumption Spending Under Alternative Policy Scenarios (Stylized Woman with Mean Earnings Born in 1975)

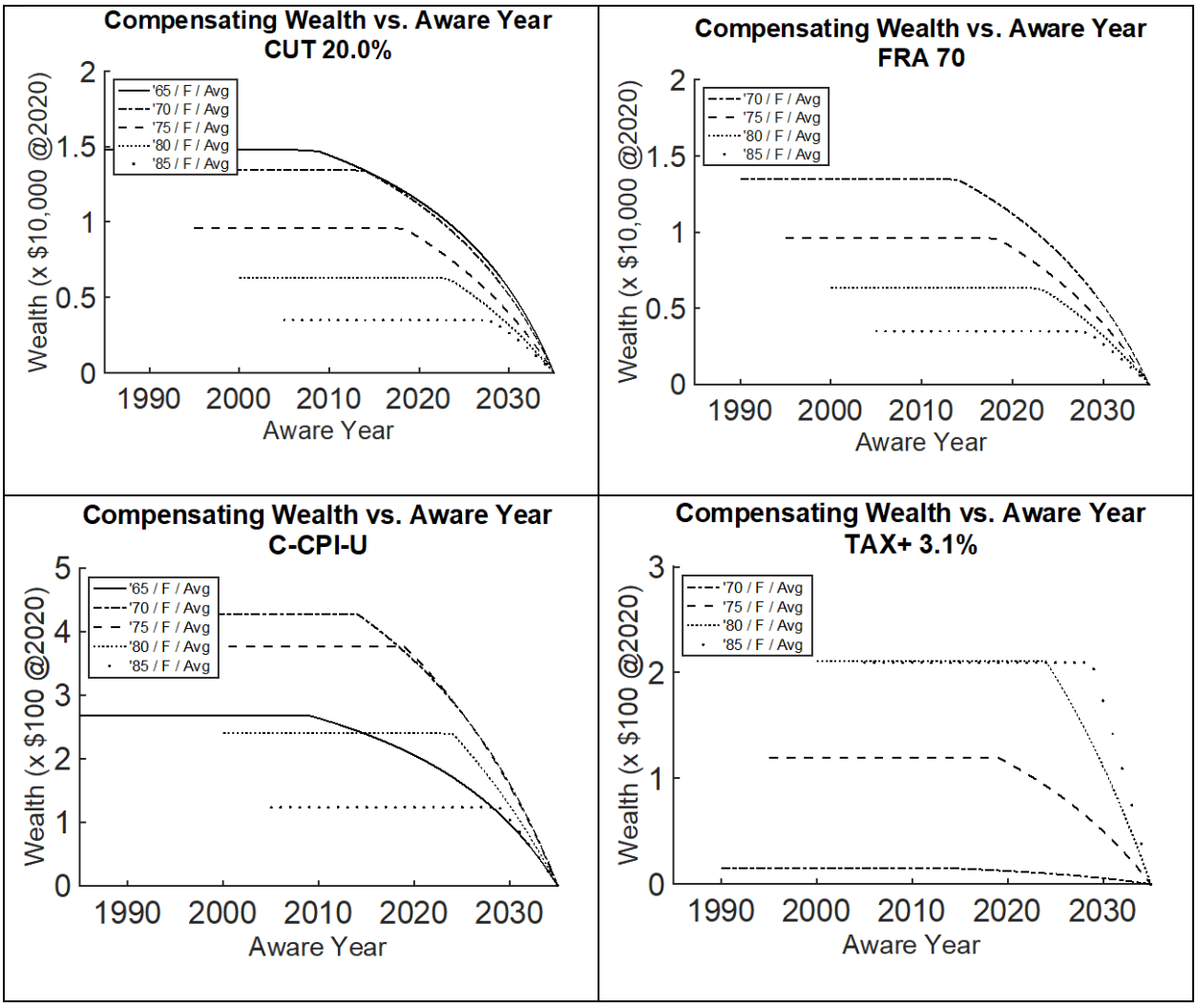


Notes: Authors' calculations of consumption path for female with mean income under alternative scenarios. Based on female mortality rates and mean earnings. Results for males are similar and available upon request.

Figure 5 shows compensating wealth by aware year for the four policies that affect women earning the average wage in the 1965, 1970, 1975, 1980, and 1985 birth cohorts. The four panels correspond to policies 2, 3, 4, and 5, i.e., cutting benefits across the board by 20%, changing FRA to 70, changing to the chained CPI, and increasing payroll taxes by 3.1%. Generally, policies 6 and 7 – changing the PIA formula and removing the Social Security wage maximum – do not affect average earners. Note that the vertical scales of the top two panels (CUT and FRA) are multiples of $10,000 and the bottom two panels (C-CPI-U and TAX+3.1) are multiples of $100. For an individual who retires at 67, a cut in benefits by 20% is nearly identical to changing her FRA to 70. However, whereas a 20% cut affects all cohorts, changing the FRA to 70 affects only cohorts that begin claiming benefits in 2035 or later, i.e., cohorts born in 1968 or after.

Similarly, changing to chained CPI for COLA affects all cohorts, but increasing payroll taxes only affects cohorts that are still working in 2035—workers born in 1969 or after.

Figure 5: Compensating Wealth vs. Aware Year (Reforms Affecting Average Earner)



Notes: Authors' calculations. Figures based on female mortality rates. Figures for males are similar and available upon request.

For all curves in Figure 5, compensating wealth is a non-increasing function of the aware year and goes to zero at 2035, the common start date for all new policies. Clearly, having more time to plan is better than having less. However, if the knowledge doesn't have an immediate impact on spending or

saving, then it doesn't increase compensating wealth. This is the explanation for the initial flat regions of these curves, which begin for each cohort at the year the individual begins work at age 20 and remain flat to around age 40. In these years, our cohorts' wages are relatively low, and they are borrowing as much as they can. This inflexibility means that any information about future reform cannot be acted on immediately. Indeed, Table 4 shows the earliest age and year at which information about reform would affect consumption or saving choices in the life cycle model. This age/year is roughly the time when the individual finds it optimal, given her anticipated future wages and Social Security benefits, to finish paying down debt and start saving for retirement.[8] Any knowledge received in advance of these dates does not have any additional value. The ages shown in Table 4 are roughly consistent with the observation that participation in and contributions to employer-sponsored retirement plans increase with age (see, e.g., Vanguard 2020). That is, many individuals ramp up saving during middle age when incomes are higher. Variation across cohorts is driven by differences in income and mortality. Younger cohorts generally have higher incomes and lower mortality (i.e., a longer retirement to plan for).

Table 4: Age/Date When Information Begins to Affect Choices

Year of Birth	Low-Income	Average-Income	High-Income
1960	48/2008	41/2001	38/1998
1965	48/2013	41/2006	38/2003
1970	47/2017	43/2013	39/2009
1975	46/2021	42/2017	39/2014
1980	46/2026	42/2022	39/2019
1985	46/2031	41/2026	39/2024
1990	44/2034	41/2031	39/2029

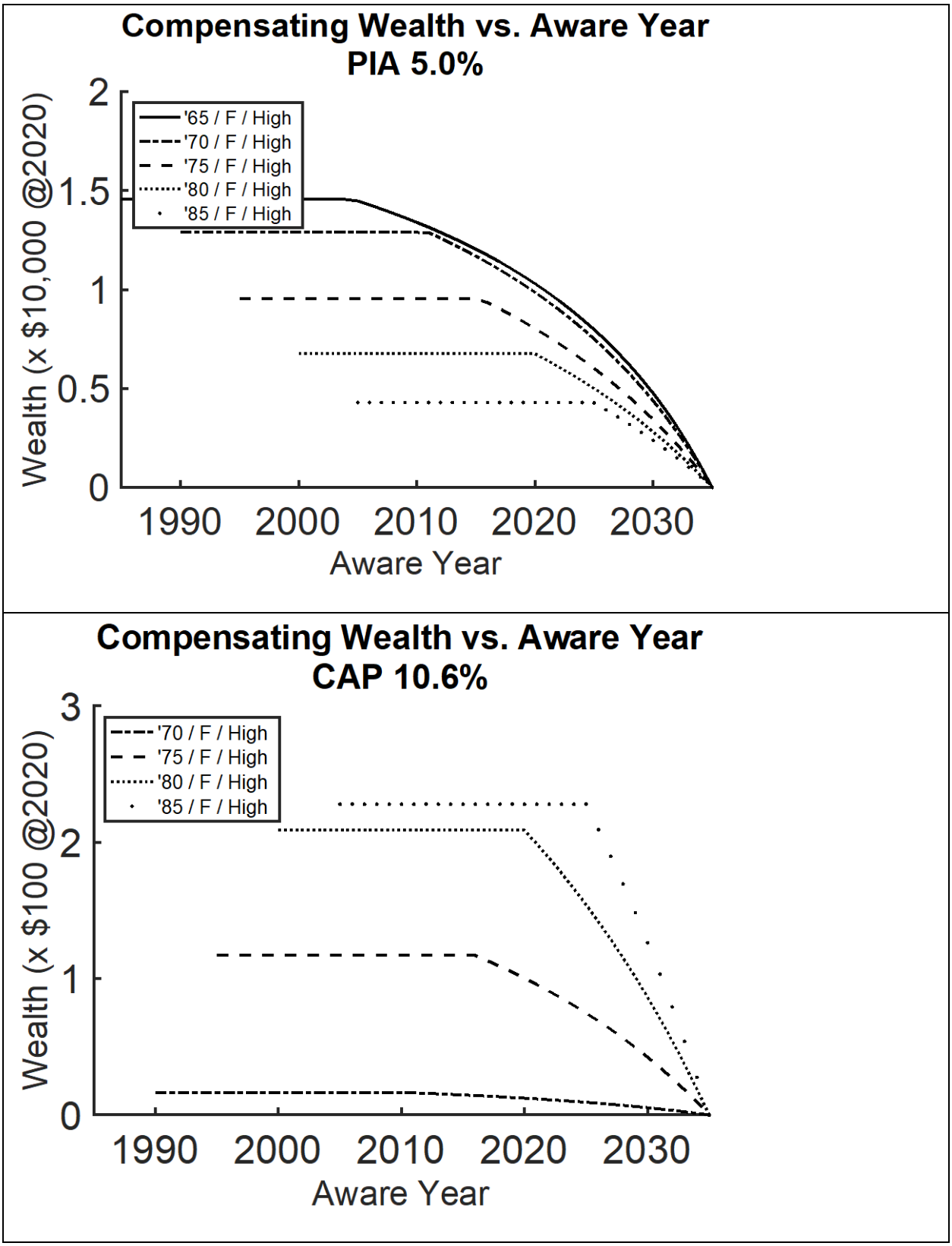
Notes: Authors' calculations. Figures based on female mortality rates. Figures for males are similar and available upon request.

[8] To be more specific, in most cases, the individual begins to save for retirement in the year following the one indicated in the table; for three cases (the low-income 1970 cohort, the average-income 1975 cohort, and the average-income 1980 cohort) the individual begins saving for retirement in the same year.

The cross-cohort patterns observed in Figure 5 can be explained by when the policies begin to affect the cohorts. For example, consider the policy of changing the FRA to 70. This policy reduces an individual's retirement benefit but isn't felt until an individual actually retires at age 67. Thus, the cohort born in 1970 first feels the policy's effect in 2037, the cohort born in 1975 first feels the policy's effect in 2042, etc. Since the policy change affects cohorts at a certain age versus in a certain year, younger cohorts have more time to prepare. In effect, the policy start date is extended and awareness is less valuable. As a result, the compensating wealth curves for changing FRA to 70 are nested—the curve for the cohort born in 1970 lies above that for 1975, which is above the curve for 1980, etc. The 1965 cohort is not affected as individuals born in this year have already retired. In contrast, consider the CUT policy. The argument in the previous paragraph still applies to pre-retirement cohorts; indeed, the two policies are essentially equivalent for them. However, the 1965 cohort is affected by this policy change.

Figure 6 shows the impact of the two policies – 6 and 7 – that affect only high earners. The impact is depicted for high-earning women in different cohorts. The reduction in the top PIA factor has a similar pattern as the across-the-board benefit cut.

Figure 6: Compensating Wealth vs. Aware Year (Reforms Affecting High Earners Only)



Notes: Authors' calculations. Figures based on female mortality rates. Figures for males are similar and available upon request.

We now present our primary results in tabular form, which gives us the space to add results for low- and high-earners (in addition to average earners), and the 1960 and 1980 cohorts (in addition to those depicted in Figures 5 and 6). Table 5 reports how valuable it would be to inform individuals of each reform in 2020 rather than when the cut takes place in 2035. The top number in each cell indicates the monetary amount (in 2020 dollars) that they would pay to be aware of the cut in 2020. The lower number, in parentheses, indicates the monetary amount relative to their average monthly earnings (AIME). We emphasize that Table 5 shows only the cost of government indecision (announcing the policy in 2035 versus 2020) and goes beyond the direct impact of the policies on individuals (which was shown in Table 2).

The first column of Table 5 shows that an average-earning woman born in 1960 would pay $9,664, or 1.9 months of earnings, to be informed of an impending 20% cut in 2020 rather than in 2035. For low-income women born in 1960, the figure is $3,793, or 2.0 months of earnings. High-earning women would pay more in absolute dollars to be informed early ($14,042), but the amount they would pay is a smaller multiple (1.27) of their AIME. The compensating wealth of the 1965 birth cohort is higher than that of the 1960 birth cohort. Both of these cohorts are already retired when the policy change goes into effect. Thus, both cohorts first feel the change at the same time – in 2035 – but at different ages. The younger cohort therefore makes better use of early awareness. For the remaining birth cohorts, which have not yet retired, compensating wealth declines for younger cohorts, in line with the results in Figure 5. Becoming aware early has the lowest value for the 1990 birth cohort. Learning about Social Security benefit cuts at age 30 instead of at age 45 is of marginal value because individuals have only recently started to save for retirement (see Table 4).

The second column shows results for raising the full retirement age in 2035. Individuals born before 1968 gain no value in learning about this change early since they will be retired before 2035 and

unaffected by the policy. However, for those born after 1968, the effect of raising the full retirement age to 70 is nearly the same as reducing benefits across the board by 20%. As discussed earlier, these policies are equivalent for all cohorts affected by them. The equivalence of cutting benefits and raising the FRA is well known among public finance economists. However, policy discussions more often focus on raising the FRA than on cutting benefits, perhaps because the public is less aware of their equivalence.

The value of advance knowledge for the final four reforms is small. We saw in Table 3 that switching to a chained index would close only a small portion of the financial shortfall of Social Security. The third column of Table 5 shows that knowing about the switch 15 years in advance has similarly low stakes. A sizable 3.1% increase in the payroll tax would reduce the net wealth of workers, but the fourth column of Table 5 indicates that knowing about it in advance would not be that valuable. Older generations would largely escape. The tax hike would cost the 1990 cohort the most (see Table 3). However, learning about the change 15 years in advance appears to have only modest value given that individuals in that cohort would not alter their behavior until sometime between 2029 (for the high-income group) and 2034 (for the low-income group). The fifth and sixth columns of Table 5 show results for the two policies affecting only high-income individuals. The fifth column shows that knowing in advance about reducing the top PIA factor is of considerable value to our high earners, but it is of less value than knowing about a potential 20% across the board cut in advance. The sixth column shows that learning in advance about removing the tax cap is not very valuable.

Table 5: Compensating Wealth in 2020 Dollars (and Relative to AIME) - Aware in 2020 versus 2035

Birth Year	CUT 20.0%	FRA 70	C-CPI-U	TAX+ 3.1%	PIA 5.0%	CAP 10.6%
			Low-Income Female			
1960	$3,793	$0	$8	$0	$0	$0
	(2.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
1965	$5,307	$0	$37	$0	$0	$0
	(2.68)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
1970	$5,359	$5,372	$86	$6	$0	$0
	(2.57)	(2.58)	(0.04)	(0.00)	(0.00)	(0.00)
1975	$3,427	$3,431	$70	$42	$0	$0
	(1.57)	(1.57)	(0.03)	(0.02)	(0.00)	(0.00)
1980	$1,751	$1,749	$31	$53	$0	$0
	(0.76)	(0.76)	(0.01)	(0.02)	(0.00)	(0.00)
1985	$341	$340	$0	$5	$0	$0
	(0.14)	(0.14)	(0.00)	(0.00)	(0.00)	(0.00)
1990	$0	$0	$0	$1	$0	$0
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
			Average-Income Female			
1960	$9,664	$0	$100	$0	$0	$0
	(1.90)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
1965	$11,397	$0	$205	$0	$0	$0
	(2.13)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)
1970	$11,157	$11,186	$354	$12	$0	$0
	(1.99)	(1.99)	(0.06)	(0.00)	(0.00)	(0.00)
1975	$8,964	$8,964	$361	$115	$0	$0
	(1.52)	(1.52)	(0.06)	(0.02)	(0.00)	(0.00)
1980	$6,326	$6,319	$240	$211	$0	$0
	(1.02)	(1.02)	(0.04)	(0.03)	(0.00)	(0.00)
1985	$3,497	$3,497	$123	$209	$0	$0
	(0.54)	(0.54)	(0.02)	(0.03)	(0.00)	(0.00)
1990	$980	$979	$23	$72	$0	$0
	(0.14)	(0.14)	(0.00)	(0.01)	(0.00)	(0.00)
			High-Income Female			
1960	$14,042	$0	$291	$0	$9,195	$0
	(1.27)	(0.00)	(0.03)	(0.00)	(0.83)	(0.00)
1965	$15,479	$0	$464	$0	$10,296	$0
	(1.32)	(0.00)	(0.04)	(0.00)	(0.88)	(0.00)
1970	$14,857	$14,844	$693	$23	$9,859	$12
	(1.21)	(1.21)	(0.06)	(0.00)	(0.80)	(0.00)
1975	$12,168	$12,173	$699	$214	$8,027	$100
	(0.94)	(0.94)	(0.05)	(0.02)	(0.62)	(0.01)
1980	$10,243	$10,243	$588	$489	$6,750	$209
	(0.76)	(0.76)	(0.04)	(0.04)	(0.50)	(0.02)
1985	$6,575	$6,577	$370	$574	$4,291	$228
	(0.46)	(0.46)	(0.03)	(0.04)	(0.30)	(0.02)
1990	$3,225	$3,225	$177	$425	$2,067	$156
	(0.22)	(0.22)	(0.01)	(0.03)	(0.14)	(0.01)

Notes: Authors' calculations. Figures based on female mortality rates. Figures for males are similar and available upon request.

b. Cost of Indecision When Individuals Assume Policy Change

We now turn our attention to situations in which the individual assumes a particular reform (Policy A) will occur in 2035 and is surprised by a different policy (Policy B). In each of these cases, we hold initial wealth constant by starting the life cycle model in 2020 and endowing the individual with the wealth they would have at their current age if they had initially optimized under the assumption of no change. For this analysis, we focus on the 1975 birth cohort. Table 6 shows the compensating wealth for an aware date of 2020 under each combination of assumed and actual policies. The rows of the table represent the policies that individuals assume will be adopted in 2035. The columns represent the policies that are actually adopted. The highlighted rows correspond to the case in which individuals assume that debt will be issued and are surprised by one of the other policies. The compensating wealth figures in this row are the same as those presented in Table 5. The other rows correspond to cases in which individuals assume a policy change will occur in 2035 and are surprised by a different outcome. For example, the number in the second row and third column ($5,198) represents the compensating wealth of advance knowledge when a low-income individual assumes that benefits will be cut across the board in 2035 (CUT) but is surprised by no change (debt, or DBT) Along the diagonal, all compensating wealth amounts are zero because the actual policy adopted in 2035 is the same as the assumed policy when the individual optimizes in 2020. The last column of the table indicates the maximum compensating wealth in each row; that is, for the policy assumed in the row, it indicates the surprise that that would be most valuable to know about in advance.

The results in Table 6 suggest that advance knowledge about benefit levels is more valuable than advance knowledge about taxes. For example, when the low-income or average-income individual assumes a future in which benefit levels will not change (DBT, PIA, CAP, or TAX) or a future in which benefit levels will change only slightly (CPI), being surprised by a large drop in benefit levels (CUT or FRA)

is very costly relative to knowing in advance. Similarly, when the low-income or average-income individual assumes that benefits will be cut significantly (CUT or FRA), being surprised by no change to benefits (DBT, PIA, CAP, or TAX) or a small change to benefits (CPI) is very costly. Note that advance information has value even for positive surprises that increase the present value of benefits because knowing benefit levels in advance allows individuals to adjust consumption earlier.

Table 6: Compensating Wealth of Alternative Policy Combinations - Aware in 2020 versus 2035

Low-Income Female

Plan/Actual: FRA	FRA	CUT	DBT	PIA	CAP	TAX	CPI	Max of Row
FRA	$0	$0	$5,206	$5,206	$5,206	$4,153	$3,717	$5,206
CUT	$0	$0	$5,198	$5,198	$5,198	$4,146	$3,711	$5,198
DBT	$3,431	$3,427	$0	$0	$0	$42	$70	$3,431
PIA	$3,431	$3,427	$0	$0	$0	$42	$70	$3,431
CAP	$3,431	$3,427	$0	$0	$0	$42	$70	$3,431
TAX	$2,829	$2,826	$43	$43	$43	$0	$4	$2,829
CPI	$2,656	$2,652	$74	$74	$74	$4	$0	$2,656

Average-Income Female

Plan/Actual: CUT	CUT	FRA	DBT	PIA	CAP	TAX	CPI	Max of Row
CUT	$0	$0	$11,939	$11,939	$11,939	$9,422	$7,515	$11,939
FRA	$0	$0	$11,939	$11,939	$11,939	$9,422	$7,515	$11,939
DBT	$8,964	$8,964	$0	$0	$0	$115	$361	$8,964
PIA	$8,964	$8,964	$0	$0	$0	$115	$361	$8,964
CAP	$8,964	$8,964	$0	$0	$0	$115	$361	$8,964
TAX	$7,256	$7,256	$118	$118	$118	$0	$72	$7,256
CPI	$6,010	$6,010	$386	$386	$386	$75	$0	$6,010

High-Income Female

Plan/Actual: FRA	FRA	CUT	DBT	CAP	PIA	TAX	CPI	Max of Row
FRA	$0	$0	$14,986	$12,391	$519	$11,281	$8,606	$14,986
CUT	$0	$0	$14,980	$12,386	$518	$11,275	$8,602	$14,980
DBT	$12,173	$12,168	$0	$100	$8,027	$214	$699	$12,173
CAP	$10,235	$10,231	$102	$0	$6,444	$22	$275	$10,235
PIA	$500	$499	$9,504	$7,500	$0	$6,660	$4,694	$9,504
TAX	$9,392	$9,388	$219	$22	$5,767	$0	$144	$9,392
CPI	$7,355	$7,351	$735	$284	$4,172	$148	$0	$7,355

Notes: Authors' calculations. Figures based on female mortality rates. Figures for males are similar and available upon request.

Thus far, we have assumed CRRA utility with a coefficient of relative risk aversion of 3. While this value is often used in modeling, some empirical evidence suggests that it could be significantly lower, on the order of 1 (Gourinchas and Parker 2002; Hurd 1989). Our sensitivity analysis suggests that policy indecision has a lower cost when individuals are less risk averse. For example, when the coefficient of relative risk aversion is 1, an average-income female who assumes no change (DBT) values advance knowledge of a benefit cut (CUT) at only $937, or about 16% of average indexed monthly earnings. However, the pattern remains similar: being surprised by a change in benefits has a greater cost than being surprised by a change in taxes.[9]

VI. Discussion and Conclusions

Knowing in advance about any benefit cuts or increases in the full retirement age that will be enacted to address the depletion of the Social Security trust fund can be very valuable. The value of receiving the information in 2020 rather than in 2035 can be as high as 2.5 months of earnings. Advance knowledge about payroll tax increases is much less valuable. There are also important distributional effects. If the value of advance knowledge is measured relative to earnings, then the stakes are actually higher for low-income workers than high-income workers. Low earners rely more on Social Security, so it comes as no surprise that advance information about future policies would be proportionately more valuable to lower-income individuals.

It is important to emphasize that the value of early awareness of future policy change represents a pure efficiency gain. Policymakers are well aware that the trust fund will be exhausted in the early 2030s, and the policy options that will be available at that time are known now. Our findings suggest that simply deciding now what policy will be followed when the trust fund runs dry, rather than waiting

[9] Full sensitivity analysis results are available from the authors upon request.

until 2035, can be the equivalent of giving people a bonus of between 1 and 2.5 months of earnings. These gains represent a "free lunch" in the sense that they can be realized just by making a decision about a problem that will have to be faced in the near future. Failing to do so complicates people's retirement plans. Thus, government indecision has a real cost.

We have shown that in the absence of an early policy announcement, people can make two kinds of mistakes, both costly. They could assume that benefits will be maintained even after the trust fund exhaustion and then be surprised that benefit cuts are enacted, or they could assume that they will face benefit cuts only to find out in 2035 that they won't. Either mistake is possible in the absence of the government making an early decision, and both mistakes are roughly equivalently costly. These costly mistakes would be avoided if the government made a decision today about what it will do when the trust fund is exhausted. The failure to realize the awareness gains that we calculate represent the cost of Washington failing to come to grips with the Social Security solvency issue.

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