PENN WHARTON
UNIVERSITY *of* PENNSYLVANIA

Budget Model

NOTE: This brief is an update of a previous PWBM analysis *released in March 2019*.

Summary: We project that the Social Security 2100 Act would eliminate Social Security's long-run imbalance while having little impact on the economy within 10 years and reducing GDP by 1.1 percent by 2049 relative to current policy.

Key Points

- In this update to our analysis, we project that the Social Security 2100 Act would eliminate Social Security's conventional long-range imbalance while reducing the program's short-range imbalance on a dynamic basis.

- The Act reduces annual shortfalls that would otherwise add to national deficits under current policy, but at the cost of new tax distortions. In the short run, the two effects nearly offset in the macroeconomy. We project that the Act decreases GDP by 0.5 percent by 2029 and decreases GDP by 1.1 percent by 2049.

- PWBM previously analyzed the Social Security 2100 bill in March of this year. Since that time, PWBM has made enhancements to both our Social Security and our dynamic overlapping generations equilibrium models. These enhancements were made as part of our ongoing process to continually develop the most flexible and dependable model possible.

Updated on October 16, 2019 with corrections to dynamic analyis that previously pulled data from an incorrect database series.

The Social Security 2100 Act: Updated Analysis of Effects on Social Security Finances and the Economy

Earlier this year, Representative John Larson introduced the Social Security 2100 Act, which raises tax revenue and includes a modest expansion of benefits. This PWBM analysis of the Larson proposal is an update from our previous analysis released in March 2019. This brief reports our projections of the net impact of the Social Security 2100 Act on Social Security's financial condition and the macroeconomic economy using PWBM's

model with integrated Social Security and Tax modules. Our updated financial projections are compared with those of the Social Security Administration (SSA) Office of the Chief Actuaries ("Actuaries"), released on September 18, 2018.

PWBM previously analyzed the Social Security 2100 bill in March of this year. Since that time, PWBM has made enhancements to both our Social Security and our dynamic overlapping generations (OLG) models. These enhancements were made as part of our ongoing process to develop and maintain the most flexible and dependable model possible. We continually make improvements to allow us to better estimate the effects of this Act as well as other policy proposals. This round of enhancements included a new calibration of Disability Insurance and Taxes on Benefits to reflect the April 2019 Trustee report. The dynamic OLG model also has increased heterogeneity of agents by age (older population) and the labor earnings process more closely reflects historical data, as well as other more technical feature enhancements. Finally, both models benefit from more robust demographic projections.[1]

Social Security 2100 Act: Main Features

The Social Security 2100 Act contains several policy provisions that alter tax revenue and benefit calculations. Table 1 summarizes the Act's provisions and compares them to current policy.

Table 1: Reforms to To Taxes and Benefits in the Social Security 2100 Act

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	Current Policy (2018)	Social Security 2100 Act
Tax Provision		
OASDI Combined Employer & Employee Tax Rate	12.40%	Increase by 0.1 percentage points annually until reaching 14.8% by 2043
Payroll Taxes on Wage Earnings Above $400,000	No	OASDI combined employer & employee tax rate
Taxes on OASDI Benefits	Minimum income thresholds $34,000 (single), $44,000 (joint); up to 85% of benefits	Minimum income thresholds $50,000 (single), $100,000 (joint); up to 85% of benefits
Benefit Provision		
Cost of Living Adjustment (COLA)	CPI- Urban Wage Earners and Clerical Workers (CPI-W)	CPI-Elderly (CPI-E)
Primary Insurance Amount (PIA) Bend Points	90/32/15	93/32/15
Benefits on taxable income above the current tax max	No	AIME+ of 2%
Special Minimum PIA	Indexed to CPI-W, full special minimum PIA is $872.50 in 2019	Minimum PIA tied to COLA, (2020) initial min. PIA 125% of poverty line, (post-2020) initial minimum PIA grows by the National Averate Wage Index (AWI)

The Social Security 2100 Act would increase benefits in three primary ways. First, the primary insurance amount (PIA) formula, which is used to calculate initial benefits at retirement, is made more generous for low-income workers. In particular, the match rate for the lowest earnings bracket (see the PIA bend points in Table 1) is increased from 90 percent to 93 percent. Moreover, a new bend point with a match rate of 2 percent is added that provides some additional benefits for those paying taxes on earnings above the taxable maximum due to a new provision discussed below. Second, the Act replaces the price index formula (CPI-W) that is currently used for calculating cost-of-living adjustments (COLA) on benefits after retirement with a new formula (CPI-E). This new formula more closely aligns annual COLA adjustments to the kinds of goods and services on which the elderly spend relatively more, including out-of-pocket health care expenses. The prices of those goods have historically increased faster than the prices of goods and services represented by the current formula. Third, the Act increases the minimum benefit level such that the minimum PIA of workers who work more than 30 years would be set to 125 percent of the official poverty line and this threshold would grow by the National Average Wage Index.

Tax revenue provisions would be changed in three primary ways. First, the income threshold required for the taxation of Social Security benefits would be increased. Second, the payroll tax rate would be levied on earnings above $400,000. This particular provision, therefore, creates a "donut hole" where earnings between

the taxable maximum, equal to $132,900, in 2019, and $400,000 do not face payroll taxes. Since the taxable maximum--but not the $400,000 threshold--increases with average wage growth over time, the donut hole eventually disappears, making all wage income taxable. Third, the combined employer-employee payroll tax rate itself would gradually increase from 12.4 percent of taxable payroll to 14.8 percent.

The Act would also merge the OASI ("Old Age and Survivors Insurance") and DI ("Disability Insurance") trust funds. The OASI and DI programs together are commonly known as "Social Security." Their respective trust funds, however, are technically separate under current policy, although the distinction means very little in practice. This provision would eliminate that technical distinction.

Impact on Social Security Finances: The Present-Value Balance Ratio

Table 2 reports PWBM's projections of the Social Security 2100 Act on Social Security's long-range and short-range actuarial *present-value balance ratios* and compares our long-range estimates to those of the SSA Actuaries (September 2019). The present-value balance ratio is a conventional accounting measure that indicates the program's shortfall as a fraction of all future payroll. The numerator of this ratio is set equal to the value of the trust fund plus the present value of projected receipts less payments over the shown time horizon.[2] This numerator is then divided by the present value of taxable payroll to produce the present-value balance ratio.

Under current policy, PWBM projects a present-value balance ratio of -3.96 percent of future payroll over the next 75 years, between 2019 and 2093. In comparison, the SSA Actuaries estimate a smaller (im)balance ratio of -2.78 over the same period. Table 2 also shows PWBM and SSA Actuaries' projections of changes in the balance ratio under the Social Security 2100 Act. Both PWBM and SSA project that the Act would eliminate Social Security's long-range imbalance, although SSA shows a larger positive balance than PWBM.

Table 2: Estimated OASDI Financial Effects of the Social Security 2100 Act Relative to Current Policy, percentage points

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	Long Range OASDI Actuarial Present Value Balance Ratio[3]			Short Range OASDI Actuarial Present Value Balance Ratio[4]
	SSA Actuaries[5]	PWBM		PWBM
	Static Estimates (2019-2093)[6]	Conventional Estimates (2019-2093)[7]	Conventional Estimates, Interaction Effects (2019-2093)	Dynamic Estimates (2019-2049)[8]
Current Policy	-2.78	-3.96	-3.96	-3.16
Provision (Change in OASDI Actuarial Present Value Balance Ratio[9])				
First PIA Factor of 93	-0.24	-0.25	-0.25	-0.26
Use CPI-E to Calculate COLA	-0.41	-0.43	-0.44	-0.33
Re-configure Special Minimum PIA	-0.15	-0.03	-0.02	-0.02
Increase Income Thresholds for Taxes on OASDI Benefits	-0.14	-0.11	-0.11	-0.26
Payroll Taxes on Wage Earnings Above $400,000 'donut hole'	1.93	2.29	2.29	1.51
OASDI Combined Employer & Employee Tax Rate of 14.6 Percent	1.87	2.12	2.53	1.46
Merge the OASI and DI trust funds	Negligible	Negligible	Negligible	Negligible
Total, All Provisions, Including Interaction Effects	3.18	3.99	3.99	2.25
New OASDI Actuarial Present Value Balance Ratio[10] (Current Policy + Total Change from all Provisions)	0.39	0.04	0.04	-0.91

Note: Consistent with our previous dynamic analysis and the empirical evidence, the dynamic projections above assume that the U.S. economy is 40 percent open and 60 percent closed. Specifically, 40 percent of new government debt is purchased by foreigners.

PWBM's long-range conventional estimates for the new provisions shown in Table 2 include various economic responses ("elasticities") associated with reclassification and timing of income that are assumed to change the size of the payroll tax base but not GDP or factor prices. As such, our conventional estimates do not include the impact of rising government debt on capital formation or the saving or labor supply responses of households to changes in policy. The last column of Table 2 reports PWBM's dynamic estimates (accounting for the saving and labor supply responses) of the actuarial balance ratio over a 31-year horizon, between 2019 and 2049. These dynamic estimates cannot be extended out for a longer time horizon since U.S. baseline policies (including non-Social Security finances) are not economically sustainable over a much longer time period. Our projections show that the Social Security 2100 Act reduces (the absolute magnitude of) Social Security's actuarial balance ratio through 2049 from -3.16 under current policy to -0.91, thereby reducing but not closing Social Security's imbalance once dynamics are considered.
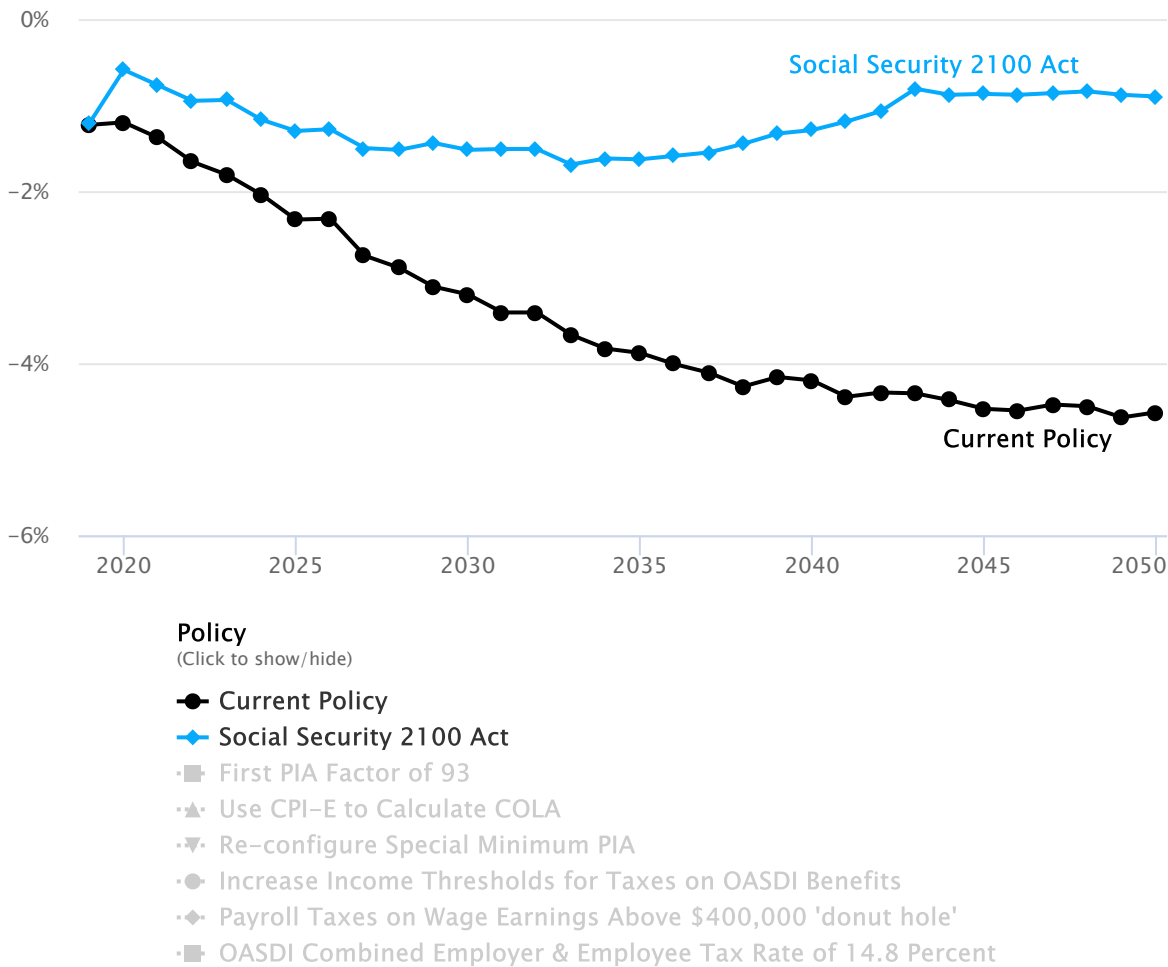
Impact on Social Security Finances: The Annual Balance Ratio

Figure 1 shows Social Security's balance ratio on an *annual* basis, under current policy and the Social Security 2100 Act. This ratio is calculated by subtracting annual costs (including all benefit expenditures) from revenues (excluding interest income) and then dividing this difference by annual taxable payroll under current policy. Each line shown in Figure 1 includes the annual balance ratio as a *level* (not the change) of each provision by itself, as indicated by the line label.[11]

Figure 1: Social Security's Annual Non-Interest Income Balance as a Share of Taxable Payroll, Short Range (2019-2049) Dynamic Estimates

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Note: Please view online to see our estimates of each provision alone.

Policy
(Click to show/hide)
- Current Policy
- Social Security 2100 Act
- First PIA Factor of 93
- Use CPI–E to Calculate COLA
- Re–configure Special Minimum PIA
- Increase Income Thresholds for Taxes on OASDI Benefits
- Payroll Taxes on Wage Earnings Above $400,000 'donut hole'
- OASDI Combined Employer & Employee Tax Rate of 14.8 Percent

Note: Consistent with our previous dynamic analysis and the empirical evidence, the projections above assume that the U.S. economy is 40 percent open and 60 percent closed. Specifically, 40 percent of new government debt is purchased by foreigners.

Impact on the Economy

Our previous analysis of a range of possible reform options demonstrated that virtually all possible reforms to Social Security that create long-run balance expand the size of GDP by more than current policy, as current policy finances benefits by increasing deficits over time. Reforms that combine progressive benefits reductions with tax increases ("combined reforms") promote the most economic growth, by over 5 percent of GDP by 2049,[12] by reducing debt accumulation and encouraging additional retirement savings by higher-income households.

Table 3 reports the projected impact of the Social Security 2100 Act on GDP, labor income, hours worked and U.S. capital services in the short term (2020), after ten years (2029), after another decade (2040) and at the end of 30 years (2049). We project that the Social Security 2100 Act decreases GDP by 0.5 percent by 2029 and by 1.1 percent by 2049. The reason for the poorer economic performance relative to more combined reforms is that the Act does not reduce benefits. In fact, relative to current Social Security policy, the proposal increases benefits by about one half of one percent of future taxable payroll in 2049. Taxes that distort economic activity are then used to reduce the actuarial balance over time, including these new benefits. The Act, therefore, actually decreases the need for higher-income households to save more for their own retirement, whereas combined reforms generally increase the need. Higher benefits combined with higher marginal tax rates

overall and especially at the highest incomes (above $400,000, where people are pushed out of the zero-rate "donut hole") also eventually decrease both the need and incentives to work (labor supply).

Table 3: Social Security 2100 Act Effects on Key Macroeconomic Variables Relative to Current Policy in Year Shown

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Year	GDP (% change)	Labor Income (% change)	Hours Worked (% change)	Capital Services (% change)
2020	-0.2	-0.2	0.3	-0.1
2029	-0.5	-0.5	0.1	-0.6
2040	-0.8	-0.8	-0.1	-1.3
2049	-1.1	-1.1	-0.1	-1.9

Note: Consistent with our previous dynamic analysis and the empirical evidence, the projections above assume that the U.S. economy is 40 percent open and 60 percent closed. Specifically, 40 percent of new government debt is purchased by foreigners.

Rich Prisinzano and Sophie Shin contributed to this analysis under the direction of Diane Lim with additional support from Kimberly Burham, Jagadeesh Gokhale and Kent Smetters. Prepared for the PWBM website by Mariko Paulson. Calculations are based on PWBM's model that is developed and maintained by PWBM staff.

1. Updates to the models include but are not limited to in-model estimates of a partially open economy, refinements to federal debt maturity and corporate debt, detailed treatment of business entities, and time-varying OASI benefit brackets, survival, birth and immigration rates. We updated the calibration of Disability Insurance and Taxes on Benefits to reflect the April 2019 Trustees report. Other updates include increasing the heterogeneity of agents by age (older population), allowing the labor earnings process to more closely reflect historical data, and more robust demographic projections. ↩

2. By tradition, SSA projections add one year of costs to the end of the projection period as a buffer and PWBM estimates also follow this convention. ↩

3. Actuarial balance as a percent of current law taxable payroll. See our previous analysis for a discussion of current law and current policy. ↩

4. Actuarial balance as a percent of current law taxable payroll. See our previous analysis for a discussion of current law and current policy. ↩

5. Intermediate assumptions ↩

6. Estimates for individual provisions will not sum to the total for all provisions because they do not include interaction effects. ↩

7. Estimates for individual provisions will not sum to the total for all provisions because they do not include interaction effects. ↩

8. Estimates for individual provisions will not sum to the total for all provisions because they do not include interaction effects. ↵

9. Actuarial balance as a percent of current law taxable payroll. See our previous analysis for a discussion of current law and current policy. ↵

10. Actuarial balance as a percent of current law taxable payroll. See our previous analysis for a discussion of current law and current policy. ↵

11. Readers are encouraged to explore different policies on our Social Security Simulator. A previous brief provides detailed analysis on the simulator. As noted above, the current analysis takes advantage of updated PWBM models and as such, will yield different results for identical policies. ↵

12. In our previous analysis, which uses a previous version of our model, Option E increases GDP by 5.27 percent by 2049. ↵