.

MACROECONOMIC ANALYSIS OF H.R. 6760, THE "PROTECTING FAMILY AND SMALL BUSINESS TAX CUTS ACT OF 2018" AS REPORTED BY THE COMMITTEE ON WAYS AND MEANS

Prepared by the Staff
of the
JOINT COMMITTEE ON TAXATION

September 26, 2018
JCX-79-18

CONTENTS

INTRODUCTION

Pursuant to section 5107 of the Concurrent Resolution on the Budget for Fiscal Year 2018 and House Rule XIII(8)(b), this document,[1] prepared by the staff of the Joint Committee on Taxation ("Joint Committee staff"), provides an analysis of the macroeconomic effects of H.R. 6760, the "Protecting Family and Small Business Tax Cut Act of 2018," as reported by the Committee on Ways and Means on September 13, 2018.

[1] This document may be cited as follows: Joint Committee on Taxation, Macroeconomic Analysis of H.R. 6760, the "Protecting Family and Small Business Tax Cut Act of 2018" as reported by the Committee on Ways and Means (JCX-79-18), September 26, 2018. This document can also be found on the Joint Committee on Taxation website at www.jct.gov.

MACROECONOMIC ANALYSIS OF H.R. 6760 AS REPORTED BY THE COMMITTEE ON WAYS AND MEANS

This report provides an analysis of the macroeconomic effects of a proposal to reform the Internal Revenue Code ("Code"). Specifically, the proposal analyzed here is the one summarized in JCX-71-18, *Estimated Revenue Effects of H.R. 6760, the "Protecting Family and Small Business Tax Cuts Act of 2018," Scheduled for Markup by the Committee on Ways and Means on September 13, 2018.* The Joint Committee staff estimates that this proposal would increase the average level of output (as measured by real Gross Domestic Product ("GDP") by about 0.1 percent from 2019 to 2028 relative to average level under the present law baseline. That increase in output would increase revenues, relative to the conventional estimate of a loss of $631 billion over that period, by about $93 billion. This budget effect would be partially offset by an increase in interest payments on the Federal debt of about $7 billion over the budget period. The Joint Committee staff estimates that both the increase in GDP and resulting additional revenues within the budget window would begin to decline during following years as the increasing Federal debt caused by this bill begins to crowd out private investment. The Joint Committee staff projects that in the decades after 2028, while employment will continue to be somewhat higher than projected under present law, investment and GDP will be lower than under present law, and the budgetary feedback from this effect will become negative.

The following discussion analyzes the macroeconomic effects of the bill. The estimate of the macroeconomic revenue feedback effects of this legislation and the following supplementary analysis were produced using three macroeconomic simulation models to simulate the growth effects of the bill: (1) the Joint Committee staff's Macroeconomic Equilibrium Growth ("MEG")[2] model; (2) an overlapping generations model ("OLG");[3] and (3) the Joint Committee staff's dynamic stochastic general equilibrium model ("DSGE").[4] A brief description of the models and the parameter values for each used in this analysis appear in the Appendix to this

---

[2] A detailed description of the MEG model may be found in Joint Committee on Taxation, *Macroeconomic Analysis of Various Proposals to Provide $500 Billion in Tax Relief* (JCX-4-05), March 1, 2005, and Joint Committee on Taxation, *Overview of the Work of the Staff of the Joint Committee on Taxation to Model the Macroeconomic Effects of Proposes Tax Legislation to Comply with House Rule XIII3(h)(2)* (JCX-105-03), December 22, 2003.

[3] The OLG model currently used by JCT is leased from Tax Policy Advisors, LLC. Information about this model may be found in John W. Diamond and George R. Zodrow, *Modeling U.S. and Foreign Multinationals in an OLG-CGE Model*, Baker Institute for Public Policy, Rice University, working paper, 2015; and in G.R. Zodrow and J.W. Diamond, "Dynamic Overlapping Generations Computable General Equilibrium Model and the Analysis of Tax Policy: the Diamond-Zodrow Model," in P.B. Dixon and D.W. Jorgenson (eds.) *Handbook of Computable General Equilibrium Modeling*, vol. 1A, pp. 743-813, North-Holland, 2013.

[4] A description of an earlier version of the DSGE model may be found in Joint Committee on Taxation, Background Information about the Dynamic Stochastic General Equilibrium Model Used by the Staff of the Joint Committee on Taxation in the Macroeconomic Analysis of Tax Policy (JCX-52-06), December 14, 2006. An updated document, which describes modeling improvements, is forthcoming.

document.[5] This analysis is presented relative to the 2018 economic and receipts baseline ("present law") published by the Congressional Budget Office ("CBO") in April, 2018.[6]

Proposal

H.R. 6760 ("the bill") makes permanent many provisions that were enacted on a temporary basis in Public Law 115-97, with a general expiration date of taxable years after December 31, 2025. These provisions include significant revision to individual income tax rates, lowering the top individual income tax rate from 39.6 percent to 37 percent, lowering statutory tax rates for most of the remaining tax rate brackets, and eliminating a number of deductions and credits from individual taxable income while increasing others. The biggest such changes in the tax base included eliminating personal exemptions while increasing the standard deduction, increasing the maximum amount of the child tax credit while increasing the income range over which individuals may claim it, and generally doubling the exemption amount for the estate, gift, and generation skipping transfer taxes. All of these recently enacted provisions are scheduled to expire after December 31, 2025, and are made permanent under the bill. The bill would also make permanent two business provisions that are scheduled to expire after December 31, 2025: individuals receiving income from certain pass-through businesses may deduct 20 percent of that income from their individual income tax, while a cap is imposed on the amount of certain passive losses that may be deducted.

Overall, the net effect of the changes to the individual income tax is to reduce average tax rates on individual income relative to present law by about 1.6 percentage points, while reducing effective marginal tax rates on wages by about 2.3 percentage points beginning in 2026. The bill also results in changes in effective marginal tax rates on income from capital of less than one percentage point.

Effects on output

The Joint Committee staff estimates that the proposal would increase the level of GDP relative to the baseline forecast, by about 0.5 percent during the last three years of the budget window when most of the policy takes effect, averaging out to 0.1 percent throughout the 10-year budget window. In general, tax policy affects economic growth by changing incentives for owners of capital to invest, and for potential workers to supply labor to the economy, by changing the after-tax rates of return to these two factors of production. Changes in tax policy can alter these after-tax rates of return - either directly by changing the amount of payments going to taxes, or indirectly, by changing aggregate demand, which can change gross payments for output. The projected increase in GDP in this bill results primarily from an increase in labor supply, in response to the reduction in effective marginal tax rates on wages.

---

[5] An updated summary of all three models may be found in Joint Committee on Taxation, *Overview of Joint Committee Macroeconomic Modeling* (JCX-33-18), April 23, 2018.

[6] Congressional Budget Office, *The Budget and Economic Outlook: 2018-2028*, April 2018.

Effects on employment and supply of labor

The significant reduction in marginal tax rates on labor (resulting primarily from the additional tax rate bracket, lower statutory rates for most brackets, and the increase in the child credit) provide strong incentives for an increase in labor supply. Because this reduction in marginal tax rates on wages reverses a present-law increase beginning in 2026, the timing and strength of the labor supply response varies depending on how much foresight individuals are assumed to have about the future path of marginal tax rates. The more foresight individuals are assumed to have, the more they are forecast to shift their labor effort away from years in which the rates increase under present law; under the proposal, such a shift is no longer forecast, slightly reducing labor supply before 2026 and increasing it when the proposal takes effect. On average, employment is projected to increase by about 0.7 percent relative to baseline levels during the last three years of the budget period, averaging to about 0.2 percent over the entire budget window.

Effects on capital stock

Because the bill results in small changes in the taxation of business capital, it provides little direct incentive for changes in investment in business capital. The slight reduction in the cost of capital is projected to result in an increase of about 0.1 percent relative to capital stock under present law during the last three years of the budget period, averaging to a negligible effect over the entire budget window. In later years, as increasing Federal government debt begins to crowd out private investment, the stock of capital is projected to fall relative to present law.

Effects on consumption

The additional income generated by additional employment - combined with the decreased tax liability owing to the proposal - provides individuals with more disposable income, thus increasing consumption. The Joint Committee staff estimates that consumption would be increased relative to baseline levels of consumption by about 0.5 percent during the last three years of the budget window, averaging to about 0.2 percent throughout that 10-year period.

Effects of the estate and generation skipping transfer tax

Evidence from economic empirical and theoretical research on the effects of the estate and generation skipping transfer tax (referred to here as “estate tax”) on economic growth is very mixed. On the one hand, to the extent that an individual’s labor effort and investment behavior is driven by a desire to maximize the amount of wealth to be left to heirs, an increase in the exemption level of the estate tax would increase the marginal value to him of providing these additional resources to the economy; if this were the only behavioral response to the estate tax, the higher exemption would be expected to increase growth. However, it is also possible that individuals subject to the estate tax desire to leave a specific dollar amount to their heirs; in this case, the increased exemption from the tax would allow them to reach that target amount more quickly, thus reducing their incentive to work and invest. In addition, to the extent that the higher exemption increases the amount of income received by heirs, this could reduce the labor supply and savings of the heirs, thus reducing the amount of growth in the economy. Because of the uncertainty associated with the effects of the estate tax on growth from labor and investment

incentives, changes in the estate tax are incorporated in Joint Committee staff macro models as changes in the average tax rate on individual income, and as having no effect on marginal tax rates, which are the main drivers of behavioral response in Joint Committee staff macroeconomic models. Thus, the effects of the increased exemption from the estate tax are primarily a small increase in consumption, and a negligible change in GDP and other macroeconomic aggregates.[7]

Growing government debt, foresight, and crowding out

Because it permanently extends individual income tax provisions projected to result in a conventionally-estimated reduction in receipts by over $600 billion in the three years at the end of the budget window, this bill is projected to result in a growing increase in Federal government debt over time. As government debt grows, the government competes for available savings with potential private investment, increasing interest rates - a phenomenon often referred to as crowding out. The extent to which government debt can crowd out private investment is also influenced by how much investment capital is projected to be provided by foreign investors, and by how much individuals in the United States change their savings in anticipation of future government debt. This bill is projected to result in increasing crowding out of private investment.

Computable general equilibrium macroeconomic models, including those used by the Joint Committee staff in their macroeconomic analysis of this bill, cannot produce any projection of economic outcomes over an indefinite time horizon when the path of government debt is projected to grow faster than that of GDP permanently. In that circumstance, there is no economic decision jointly available to workers, consumers, and producers that allows them to pursue their objectives (utility and profit maximization) within the models because financing the growing government debt requires that increasing shares of capital available for investment become unavailable for private sector production. Economic theory and research provides varying views as to how much foresight individuals can be expected to have with respect to fiscal policy, and how strong a weight they are likely to place on future as opposed to current economic conditions in making their investment and labor decisions. As described in the Appendix, each of the three macroeconomic models used by the Joint Committee staff incorporates these mechanisms in a different manner.

[7] For a brief discussion on ramifications of estate taxation, see Joint Committee on Taxation, *The Taxation of Individuals and Families* (JCX-41-17), September 12, 2017, pp. 47-48, and for additional data and a more detailed discussion of economic issues, see Joint Committee on Taxation, *History, Present Law, and Analysis of the Federal Wealth Transfer Tax System* (JCX-52-15), March 16, 2015, pp. 24-46.

Budgetary effects

Fiscal years 2019-2028

The growth generated by the proposal is projected to reduce the revenue loss from the proposal by about $93 billion over the 2019-2028 budget period. At the same time, an increase in interest rates generated by the increase in Federal debt is expected to increase the cost of Federal debt service by about $7 billion within the budget window.

The estimate of the impact of the growth effects from this proposal on its budget effects was produced using a weighted average of those effects generated by the MEG, OLG, and DSGE models. The OLG and DSGE models are each assigned a weight of 0.3, while the MEG model is assigned a weight of 0.4.

Overall, economic growth is projected to increase Federal government receipts net of increased interest payments by about $86 billion during the budget window. Details of the estimate appear on Table 1, following.

Second and third decade effects

Because the bill is projected to result in a permanent decrease in receipts, the role of foresight and fiscal balance assumptions is especially important in analyzing the effects of this bill in years beyond the current budget window. Absent some offsetting change in fiscal policy, government debt is expected to begin requiring increasing shares of economic resources, reducing resources available for private investment. Measured relative to the April 2018 CBO baseline, in the decades after 2028, private capital investment and GDP growth are projected to slow. While employment is expected to continue to be above baseline projections, GDP is projected to become lower under the proposal than under CBO's April 2018 baseline in the decades after 2028; revenue feedback from the policy would decline commensurately. There is substantial uncertainty on the timing, and magnitude of these effects, as in any long run analysis.

The differences in the treatment of growing government debt among the Joint Committee staff models provide some insight on a key source of the uncertainty. There is substantial uncertainty arising from how future Congresses, foreign governments, and investors will react to growing deficits. As described in more detail in the Appendix, the three JCT macro models have different approaches to modeling a policy that results in growing government debt. The immediate fiscal closing assumption used in the DSGE model makes that model less useful in predicting this path than the other models. In the OLG model, fiscal closing is assumed to begin 20 years after the end of the budget window, which means decisions agents make in the second decade past the budget window are influenced by the expectation that the debt problem will be solved soon. The Joint Committee staff MEG model does not rely on such fiscal closing assumptions. Unlike the fiscal closing assumptions assumed under OLG and DSGE, the policy under analysis does not change baseline fiscal policy other than the tax policy of H.R. 6760. For this reason, Joint Committee staff reduced weights on OLG and DSGE results in analyzing the long-run effects of the policy on economic growth in producing this estimate.

TABLE 1:
ESTIMATED BUDGET EFFECTS OF
H.R. 6760, THE "PROTECTING FAMILY AND SMALL BUSINESS TAX CUTS ACT OF 2018,"
AS REPORTED BY THE COMMITTEE ON WAYS AND MEANS

Fiscal Years 2019 - 2028

[Billions of Dollars]

Provision	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2019-23	2019-28
Conventional Estimate ……	-0.4	-2.0	-1.6	[1]	[1]	-0.1	-6.1	-102.4	-250.4	-268.0	-4.0	-630.9
Additional Effects Resulting from Macroeconomic Analysis [2][3]……	0.2	-0.1	[4]	0.6	-0.4	-0.9	7.9	24.9	24.3	29.3	0.4	86.0
NET TOTAL ……	**-0.2**	**-2.0**	**-1.6**	**0.5**	**-0.4**	**-1.0**	**1.8**	**-77.5**	**-226.1**	**-238.7**	**-3.7**	**-545.1**

Joint Committee on Taxation

NOTE: Details may not add to totals due to rounding. The date of enactment is generally assumed to be October 1, 2018.

[1] Loss of less than $50 million.

[2] Estimate includes the following effects on outlays due to increased interest rates on the Federal debt ……

2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2019-23	2019-28
[5]	[5]	[5]	-0.1	-0.1	[5]	0.7	2.0	2.1	2.0	-0.2	6.5

[3] Estimate includes the following off-budget effects ……

2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2019-23	2019-28
-0.3	-0.4	-0.5	-0.7	-0.9	-1.3	-0.5	5.4	5.1	5.6	-2.8	11.5

[4] Gain of less than $50 million.

[5] Increase in outlays of less than $50 million.

APPENDIX: DATA: MODELS, AND ASSUMPTIONS USED IN THE ANALYSIS

The Joint Committee staff analyzed the proposal using the Joint Committee staff MEG and DSGE models and an OLG model. While the models are based on economic data from the National Income and Product Accounts, taxable income is adjusted to reflect taxable income as measured by reporting on tax returns. All three models start with the standard, neoclassical production framework in which the amount of output is determined by the quantity of labor and capital used by firms, and the productivity of those factors of production; long run aggregate demand equals aggregate supply at full employment. Both individuals and firms are assumed to make decisions based on observed characteristics of the economy, including wages, prices, interest rates, tax rates, and government spending levels. In particular, the amount of labor available to the economy is affected by individuals' understanding of their after-tax returns to working, which depends on both wage rates and tax rates. Similarly, the amount of capital available to the economy is determined by investors' predictions of after-tax returns to capital, which depend on anticipated gross receipts, costs of factor inputs, and tax rates that affect those factors. The underlying structure of the MEG model relies more on reduced form behavioral response equations, while the OLG and DSGE models incorporate more theoretical microeconomic foundations.

The degree to which the Joint Committee staff relies more heavily on the results of one model versus the others depends on the specifics of the proposal being analyzed. The MEG model, which does not require a fiscal balance assumption, is better suited to analyze proposals that produce large, conventionally estimated deficits. This model allows for the modeling of four separate types of labor, and of separate marginal and average tax rates for all major individual and business income tax sources; while the other two models treat average and marginal rates the same for individual income other than wages. The availability of investment capital to firms is determined by individuals' savings response to changes in the after-tax rate of return on investment as well as by foreign capital flows. Also in the MEG and DSGE models, monetary policy conducted by the Federal Reserve Board is explicitly modeled, with delayed price adjustments to changes in economic conditions allowing for the economy to be temporarily out of equilibrium in response to fiscal and monetary policy. The monetary policy response function used in this analysis assumes that the Fed will act aggressively to counteract any demand stimulus resulting from the proposal because the economy is expected to be operating near full employment. The myopic expectation framework in the MEG model represents the extreme case of the degree of foresight individuals have about future economic conditions, in which individuals assume in each period that current economic conditions will persist permanently.

At the other end of the foresight spectrum, in the OLG model, individuals are assumed to make consumption and labor supply decisions to maximize their lifetime well-being given the resources they can foresee will be available to them. They are assumed to have complete information, or "perfect foresight," about economic conditions, such as wages, prices, interest rates, tax rates, and government spending, over their lifetimes. OLG represents a class of models with "micro-foundations" and life-cycle effects modeled separately for each of a number of "generations" (in this case 55). Taxes on labor affect the decisions of each cohort by impacting the trade-off between consumption and leisure. Individuals substitute between labor and leisure both contemporaneously and over time. The OLG model includes a more differentiated business

sector than the other two models. Firms' investment decisions respond to the effects of tax policy on the projected future value of the firm. Changes in marginal tax rates on firm profits, and changes in the value of deductions for investment affect this future valuation.

The stochastic feature of the DSGE model allows for some analysis of the effects of uncertainty about future fiscal policy on the modeling outcome, representing a less extreme foresight assumption than either of the other models. As the uncertainty about future fiscal conditions is allowed to persist over a limited period of time, DSGE is closer to OLG than to MEG on this spectrum. In DSGE there are two types of individuals who make decisions about labor supply, only one of whom has the liquidity to make investment decisions ("savers and non-savers"). As in the OLG model, these two types of individuals make consumption and labor supply decisions to maximize their discounted present value of consumption over time, including consumption of leisure. The savers supply investment capital to the economy, and receive income from investment returns. The non-savers are liquidity constrained, and are unable to invest. The existence of these two types of individuals allows for some explicit distributional analysis of taxes on investment versus taxes on labor. In addition, changes to transfers and taxes on the non-saving households will have direct effects on current period consumption and the current level of output. These features of the DSGE model allow the model to interpret real short run effects of economic policy changes.

In the OLG and DSGE models, the ability of individuals to foresee changes in fiscal conditions means that the agents in the models will be unable to make optimal economic decisions if they can foresee a permanently unstable economic future, thus preventing the models from "solving" - or completing their simulations. This problem arises in a situation where deficits are expected to increase faster than the rate of growth of GDP, which is a characteristic under present law as well as the bill. Thus it is necessary to make counter-factual "fiscal balance" assumptions about the expected path of deficits for these models. In the MEG model, agents are assumed not to foresee that eventually the growing government debt/GDP ratio will become so large that it becomes unsustainable, and the model can generate forecasts up until that point.

In the past, the Joint Committee staff has occasionally used only the MEG model to do macroeconomic analyses of policies that are projected to increase the deficit significantly.[8] Even if the fiscal balance assumption is assumed to begin after the budget window, because agents can foresee that it will occur, models can project that they will alter their behavior inside the budget window in ways that could either augment or counteract the projected effects of the actual legislation being proposed. This "anticipation effect" is stronger the closer in time it is to agents' decision making. In recent years, developmental work on the OLG model has allowed the fiscal balance assumption to be made 20 or 30 years after the budget window, thus reducing the impact of this assumption on behavior inside the budget window. Agents in the DSGE model are able to foresee the consequences of the new policy in the bill with certainty for 2.5 years into the future

[8] See, for example, Joint Committee on Taxation, "Macroeconomic Analysis of the American Recovery and Reinvestment Act of 2009," January 27, 2009, in Ways and Means Committee, *Report, 111-8 Part I, Providing for a Portion of the Economic Recovery Package Relating to Revenue measures, Unemployment, and Health*, pp. 233-240.

at any point in time Each quarter after that, they assume there is some probability (which increases over time) that the debt-to-GDP ratio will stabilize, thus allowing the model to solve and the simulation to continue. After 10 years, debt is stabilized through government expenditures.

Each model also provides a somewhat different perspective on savings/investment responses and international capital flows. The MEG model allows simulation of the proposal as drafted, with no offsetting fiscal balance assumption, and it models cross-border capital flows that can partially offset the effects of a growing deficit on interest rates. The OLG model provides some focus on shifting of investment between domestic and multinational corporations, as well as within multinational corporations across borders, but requires a fiscal balance assumption. The DSGE model provides an additional perspective on savings responses by explicitly modeling separate investment responses by savers and non-savers. The DSGE model does not model cross-border capital flows, but because this proposal does not change the taxation of foreign income, this closed-economy feature is not as limiting in this analysis.

Each major tax bill potentially presents a unique combination of changes in the definition of the taxable base for different sources of income, as well as changes in tax rates on different sources of income. Each such combination of changes may present a different amount of macroeconomic revenue feedback relative to the change in GDP generated by the proposal. Because the Joint Committee staff uses these models to facilitate analysis of tax policy, and to estimate the revenue consequences of the macroeconomic effects of tax policy, the staff has devoted a considerable amount of time and attention to modeling the specific types of income flows affected by proposals, to the extent allowed by other sets of assumptions within each macroeconomic model. Information about the effects of the proposal on average tax rates and effective marginal tax rates on each source of income, and on after-tax returns to capital and labor, is obtained from various Joint Committee staff tax models[9] (used in the production of conventional revenue estimates) to characterize the effects of the bill within the each of the models. Changes in deductions, credits and exclusions can impact effective marginal tax rates as well as average tax rates.

Tables 2-4 provide a summary of key behavioral parameters used in the each of the macroeconomic simulation models for the analysis of this proposal.

[9] Descriptions of the Joint Committee staff's conventional estimating models may be found in JCX-46-11, Testimony of the Staff of the Joint Committee on Taxation before the House Committee on Ways and Means Regarding Economic Modeling, September 21, 2011, JCX-75-15, Estimating Changes in the Federal Individual Income tax: Description of the Individual Tax Model, April 24, 2015, and other documents at www.jct.gov under "Estimating Methodology."

Table 2: Key Parameter Assumptions in the MEG Model

Labor supply elasticities in disaggregated labor supply	**Income**	**Substitution**
Low income primary	-0.1	0.2
Other primary	-0.1	0.1
Low income secondary	-0.3	0.8
Other secondary	-0.2	0.6
Wage-weighted population average with baseline rates	-0.1	0.2
Savings/consumption parameters		
Rate of time preference		0.015
Intertemporal elasticity of substitution		0.35
Derived long-run savings elasticity to the after rate of return on capital		0.25

Table 3: Key Parameter Assumptions in the DSGE Model

Frisch elasticity of labor supply	0.20
Production income share of capital	36%
Fraction of savers	48%
Monetary authority response to inflation	1.55
Monetary authority response to output	0.05
Quarterly subjective discount factor	0.9975
Constant relative risk aversion parameter on utility from consumption	2.15
Intermediate firm markup	13%
Probability of price reset	50%

Table 4: Key Parameter Assumptions in the OLG Model

Time preference	**0.005**
Intertemporal elasticity of substitution	0.4
Intratemporal elasticity of substitution between consumption and leisure	0.6
Leisure share of time endowment	0.4026
Population growth rate	0.008
Technological growth rate	0.019
Capital share for:	
Corporate	0.2
Multinational (not including IP)	0.15
Non-corporate	0.3
Housing	0.985
Adjustment cost*	2.0
Debt-to-capital ratio (average)	0.35
Substitution elasticity between capital and labor in	
Non-housing**	1.0
Housing**	1.0
Substitution elasticity for intellectual property****	1.0

* Quadratic adjustment cost function
** Cobb-Douglas production function
*** Substitution elasticity between foreign and domestic after- tax profits attributable to intellectual property