



Budget Model

Macroeconomic Effects of the \$1.9 Trillion Biden COVID Relief Plan

Summary: PWBM estimates that the \$1.9 trillion in spending in the full Biden relief plan would increase GDP in 2021 by 0.6 percent. Over time, the additional public debt resulting from the Biden plan would decrease GDP by 0.2 percent in 2022 and 0.3 percent in 2040.

Key Points

- President Biden proposed \$1.9 trillion in spending to provide economic relief during the ongoing coronavirus pandemic and recession, including support for vaccinations, direct aid to households, and relief for businesses.
- PWBM estimates that the full \$1.9 trillion Biden relief plan would increase GDP in 2021 by 0.6 percent relative to baseline.
- Over time, additional public debt resulting from the \$1.9 trillion in spending would decrease GDP in 2022 by 0.2 percent and in 2040 by 0.3 percent.

Introduction

On January 14, 2021, the Biden administration [released](#) a \$1.9 trillion emergency plan to provide economic relief during the ongoing coronavirus pandemic and recession. The package includes funding for a national vaccination program, direct aid to households, and relief for businesses. In a [companion brief](#), PWBM analyzed the budgetary and distributional effects of three direct aid provisions in the relief plan. This brief analyzes the macroeconomic effects of the full \$1.9 trillion plan.

Economic Effects of the Pandemic

Real GDP decreased by 2.5 percent from 2019 Q4 to 2020 Q4.¹ Most of the decline took place in the second quarter of 2020, with a decrease of 9 percent from the quarter prior. The economy recovered quickly in the third quarter when real GDP rose 7.5 percent from the quarter prior—ending up 3.4 percent below 2019 Q4—but growth began to taper in the last quarter of 2020 with an increase of 1 percent from the quarter prior.

A large body of research, [including work by PWBM](#), has documented peculiar characteristics of this recession. Notably, unemployment has been disproportionately concentrated among lower wage and young workers in

specific sectors, e.g., retail and leisure and hospitality.² Furthermore, as suggested in our background work, most sectors of the economy now appear to be operating at near pre-recession levels. Affected sectors, on the other hand, are limited in recovery due to pandemic behaviors and policy restrictions which affect both consumption and production. Broadly, the economy is near full employment with some sectors strictly idled for the near-term.

Because of these features of the Covid-19 recession, we model the unemployment caused by the pandemic as a reduction in the labor productivity of a portion of the workforce; we set labor productivity to zero for those who lost their jobs in an affected sector. To determine the share of affected workers, we use data from the [CPS Earner Study sample](#) (outgoing rotation groups, from January 2017 to November 2020) to calculate pandemic-related unemployment, the age distribution of affected workers, and the wage income distribution of affected workers. Table 1 shows pandemic-related unemployment by income and age groups.

Table 1: Measured pandemic-related unemployment by income and age.

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| Age groups | Income percentiles | Unemployment rate |
|------------|--------------------|-------------------|
| 21 - 35 | 0-2% | 17.8% |
| 21 - 35 | 2-11% | 10.7% |
| 21 - 35 | 11-35% | 9.4% |
| 21 - 35 | 35-66% | 7.8% |
| 21 - 35 | 66-90% | 6.6% |
| 21 - 35 | 90-98% | 4.4% |
| 21 - 35 | 98-100% | 5.0% |
| 36 - 55 | 0-2% | 10.6% |
| 36 - 55 | 2-11% | 11.8% |
| 36 - 55 | 11-35% | 7.9% |
| 36 - 55 | 35-66% | 5.9% |
| 36 - 55 | 66-90% | 6.3% |
| 36 - 55 | 90-98% | 4.9% |
| 36 - 55 | 98-100% | 4.4% |
| 56 - 70 | 0-2% | 12.9% |
| 56 - 70 | 2-11% | 11.9% |
| 56 - 70 | 11-35% | 7.0% |
| 56 - 70 | 35-66% | 7.7% |
| 56 - 70 | 66-90% | 4.7% |
| 56 - 70 | 90-98% | 1.3% |
| 56 - 70 | 98-100% | 0.2% |

Source: PWBM's calculations using CPS Earner Study sample (outgoing rotation groups) from January 2017 to November 2020.

We calculate implied productivity losses from these increases in unemployment and apply them to the years 2020 and 2021, assuming that affected sectors will not recover meaningfully until the end of the current year.

2021 Macroeconomic Estimates

PWBM finds that the Biden relief plan leads to an increase in output in 2021 as the plan's expenditures stimulate the economy, but GDP declines in subsequent years as the additional public debt crowds-out

investment in productive capital. The increase in output 2021 is due to the immediate stimulative effect of the economic recovery plan.

Table 2 shows a summary of ranges for so-called “fiscal multipliers”—the amount of additional output generated for each dollar of government spending. These ranges represent different [fiscal multipliers](#), estimated by the Congressional Budget Office, for times when output is “well below potential” and times when output is “close to potential.”

Table 2. Estimated Output Multipliers

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| Category | Total Output Multiplier | |
|---|-------------------------|---------------|
| | Low Estimate | High Estimate |
| Purchases of goods and services by the federal government | 0.2 | 0.8 |
| Transfer payments to state and local governments for infrastructure | 0.1 | 0.7 |
| Transfers to persons (unemployment benefits, education transfers and food stamps) | 0.1 | 0.7 |
| Transfer payments to state and local governments for other purposes | 0.1 | 0.6 |
| Business tax provisions primarily affecting cash flow | 0.0 | 0.1 |

Source: Computations derived from numbers provided in Congressional Budget Office Working Paper 2015–02.

Unlike the [2020 CARES Act](#), which was enacted to provide stimulus in relief during a period when output was well below potential, the 2021 Biden plan would provide stimulus in a period in which the economy is closer to its potential output (see our [background analysis](#)). Therefore, we apply multipliers towards the smaller end of each range to estimate the impact on output from Biden’s relief plan. This lower range reflects the fact that each additional dollar of aggregate demand will generate less additional output in 2021 than it did in spring or summer of 2020 when the U.S. economy was further from potential.

Table 3 shows outlays and estimated output effects of the Biden relief plan, broken down by spending category.

Table 3. Output Effects of the Biden Relief Plan

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Total Effect on Output

| Category | Outlay | Total Effect on Output | | |
|--|----------------|--------------------------------|---------------------------------|---------------|
| | | Estimate Using Low Multipliers | Estimate Using High Multipliers | PWBM Estimate |
| Increase funding for schools, fund school reopening | \$170 | \$20 | \$99 | \$20 |
| Develop a COVID vaccination program, treatments, and other containment methods | \$160 | \$27 | \$133 | \$27 |
| \$1,400 per person "Recovery Rebates" | \$465 | \$67 | \$328 | Dynamic OLG* |
| Increase and extend unemployment insurance | \$350 | \$51 | \$247 | \$51 |
| Support for small landlords and renters | \$30 | \$4 | \$21 | \$4 |
| Childcare provider support | \$25 | \$4 | \$18 | Dynamic OLG* |
| Expand the Child Tax Credit to \$3,000 per child, \$3,600 for children under 6 | \$120 | \$17 | \$85 | Dynamic OLG* |
| Aid for state and local governments | \$350 | \$42 | \$203 | \$42 |
| Other policy provisions** | \$200 | \$28 | \$138 | \$28 |
| Total | \$1,870 | \$260 | \$1,271 | \$172 |

Sources: For expedience, estimates follow JCT and category classifications follow CRFB.

* Several of the personal transfers programs are directly modeled in the Dynamic OLG model and are not estimated separately.

** Other policy provisions include a mix of business tax credits, transfers to households, state and local government aid, and infrastructure spending.

PWBM directly models the output effects of three categories of spending: (1) the "Recovery Rebate" direct payments, (2) childcare provider support, and (3) expansion of the Child Tax Credit. These provisions comprise about \$610 billion in spending. For these categories, the multipliers arise endogenously in our dynamic model when we directly model the effect of these programs on the households' budgets. Other provisions are not modeled at the micro-level, and these include other direct aid transfers to households (such as landlord and rent support), aid to states, infrastructure allocations to state and local governments, and direct federal purchases. For these categories, PWBM uses multipliers at the lower end of the range computed from the CBO analysis. We estimate that spending in these categories, which include about \$1.3 trillion in outlays, will increase GDP by about \$172 billion or about 0.8 percent.

In the PWBM dynamic model, combining the multiplier-implied \$172 billion increase in GDP with the effects of the directly-modeled transfers leads to a total increase in GDP of about 0.6 percent in 2021 relative to baseline. Although additional transfers to low income households may decrease their incentive to work, the

effect from the stimulus is larger and leads to an overall increase in GDP. This increase in GDP is reflected in higher wages, which results in a 1.3 percent increase in tax revenue in 2021.

Macroeconomic Estimates Past 2021

These 2021 economic gains are the result of about \$1.9 trillion in government spending, which significantly increases the government's debt. By 2022, government debt increases by more than 7 percent, leading to significant crowd-out of productive capital, as investors buy government debt with savings that would have otherwise gone toward investment in productive capital. Relative to the current policy baseline, capital declines by about 0.6 percent in 2022, and the decline grows over time to 0.9 percent by 2040. A drop in the stock of productive capital, however, makes existing capital more valuable, which is reflected in increases to the returns to capital by 1.1 percentage points in 2022 and 1.6 percentage points in 2040.

Less capital, in turn, decreases the marginal product of labor—each worker has access to less capital, resulting in less output per worker. This decline in output per worker is reflected in lower wages. Workers face 0.2 percent decline in their hourly wages in 2022 and a 0.3 percent decline by 2040.

The effect on labor is more mixed: although a decline in hourly wages typically has a small negative effect on hours worked, the increase in the EITC affects some lower-income households' incentive to work. The net effect of all the policy provisions is a 0.1 percent decline in total hours worked in 2022. The decline in hours worked fades over time, however, and there is no change in total hours worked by 2040.

Lower capital stock and fewer hours worked leads to a decline in GDP of 0.2 percent in 2022, relative to baseline. Over time, however, the decline in capital deepens, which leads to a decline in output of 0.3 percent in 2040 in spite of the fact that hours worked recover to their original level.

The decline in output and wages leads to lower government revenues, which drop by about 0.3 percent in 2022 and 0.2 percent in 2040. In both of these cases, the drop in revenues is driven by a decline in personal income and Social Security tax revenues, both of which are driven by the decline in wages. Some of this decline in personal income and Social Security tax revenues is offset by a small increase in corporate income taxes, which itself comes from higher corporate income as the returns to capital increase over time.

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1. Bureau of Economic Analysis. National Income and Product Accounts. Table 1.1.6. Real Gross Domestic Product, Chained Dollars. Available at: <https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey>. ↩
 2. See [Cajner et al. 2020](#), and [Bartik et al. 2020](#). ↩