What Do We Know and Do We Actually Know It: Using Federal Economic Data for Policy Analysis

May 6, 2021

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Introduction

1) **Headline economic indicators**: where do they come from and what do they tell us?

2) **Tracking the economy in real time**: new sources of private data and how to use them

3) **Forecasting revenue from tax changes**: the central role of behavior
1. Headline economic indicators
“Headline” economic indicators

- The jobs report (nonfarm payroll employment, unemployment rate)
- Gross domestic product (GDP)
“Headline” economic indicators

- The jobs report (nonfarm payroll employment, unemployment rate)
- Gross domestic product (GDP)
“Headline” economic indicators

- The jobs report (nonfarm payroll employment, unemployment rate)
The Birds and the Bureaus

Where do headline statistics come from?

1. Measurement
   • Initial releases largely from surveys and projections
   • Later revised with more complete data or direct measures
The Birds and the Bureaus

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2. Philosophy
   • What do we want to measure? Is it measurable? Does it even exist?
The Birds and the Bureaus

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   • Later revised with more complete data or direct measures

2. Philosophy
   • What do we want to measure? Is it measurable? Does it even exist?

3. Models and bureaucratic process
   • Someone has to make decisions
The Monthly Jobs Report (Employment Situation)

Prepared by the Bureau of Labor Statistics (BLS)

Released on the first Friday following the end of the month (i.e. Jobs Friday)

Covers the pay period or week that includes the 12th day of the month
The Monthly Jobs Report (Employment Situation)

Wall Street Journal, December 5, 2020:

“Employers added 245,000 jobs last month, down from 610,000 jobs in October, the Labor Department reported Friday. The unemployment rate edged down slightly to 6.7% in November from 6.9% a month earlier.”

1. “Employers added 245,000 jobs” → change in nonfarm payroll employment

2. “The unemployment rate edged down to 6.7%” → unemployment rate
Nonfarm Payroll Employment – Definition

Number of persons who worked or received pay at a nonfarm business or civilian government agency for any part of the pay period that includes the 12th of the month.
Nonfarm Payroll Employment – Definition

Number of persons who worked or received pay at a nonfarm business or civilian government agency for any part of the pay period that includes the 12th of the month.

Not included:

- Farm workers
- Self-employed (unless on own payroll, e.g. because of incorporation)
- Household employees and unpaid family workers
- Military personnel
- Intelligence agencies
Nonfarm Payroll Employment – Monthly Change

Monthly change in nonfarm payroll employment, with 3-month average

Thousands


-21,000 -18,000 -15,000 -12,000 -9,000 -6,000 -3,000 0 3,000 6,000
Nonfarm Payroll Employment – Monthly Change

Monthly change in nonfarm payroll employment, with 3-month average

Thousands

[Graph showing the monthly change in nonfarm payroll employment from 1960 to 2020 with a 3-month average.]
Nonfarm Payroll Employment – Source

Current Employment Statistics (CES), aka establishment/payroll survey

- Survey of 145,000 nonfarm businesses and government agencies.
- Covers 700,000 “establishments” (worksites) out of a total 10.2 million.
- Covered establishments employed 46 million workers in 2019 – 31% of total payroll employment
Nonfarm Payroll Employment – Source

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• Covered establishments employed 46 million workers in 2019 – 31% of total payroll employment

How do we go from 31% to 100%?

• Survey results are weighted by state, industry, and size (# of employees).
• BLS models the impact of business births (startups) and deaths (closures).
Nonfarm Payroll Employment – What Does It Tell Us?

Interpretation of a given number depends on context:

• November 2019: +266 thousand → great news!

• November 2020: +245 thousand → disaster!
Nonfarm Payroll Employment – Revisions

Monthly change in nonfarm payroll employment:
Revision from 1st to 3rd estimate as a % of 1st estimate
Nonfarm Payroll Employment – Seasonal Adjustment

Monthly change in nonfarm payroll employment

Thousands

1,000
750
500
250
0
-250
-500
-750
Nonfarm Payroll Employment – Seasonal Adjustment
Nonfarm Payroll Employment – Pros and Cons

Pros:
• Concept is straightforward
• Very good sample coverage

Cons:
• Incomplete coverage of employment
• Interpretation is highly context-dependent
• Monthly change is noisy (+ revisions) → always average!
Unemployment Rate – Definition

A person is unemployed if they are…

• Not working and available for work in the week that includes the 12th.
• Engaged in “active job search” in the prior four weeks OR on temporary layoff.
Unemployment Rate – Definition

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\[
\text{Unemployment Rate} = \frac{\text{Unemployed}}{\text{Labor Force}} = \frac{\text{Unemployed}}{\text{Employed} + \text{Unemployed}}
\]
Unemployment Rate – Definition

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\[ \text{Unemployment Rate} = \frac{\text{Unemployed}}{\text{Labor Force}} = \frac{\text{Unemployed}}{\text{Employed} + \text{Unemployed}} \]

Covers the civilian noninstitutional population age 16 and older.

Not included: military personnel, incarcerated persons, residents of nursing homes and other institutions.
Unemployment Rate – Source

Current Population Survey (CPS), aka household survey

• Survey of about 60,000 households (residential addresses).

• Sample includes 120,000 persons out of a total civilian noninstitutional population age 16 and older of 260 million – about 0.04%.

• Each person in the survey represents about 2,500 people in the population.
Unemployment Rate – Source

Current Population Survey (CPS), aka household survey

- Survey of about 60,000 households (residential addresses).
- Sample includes 120,000 persons out of a total civilian noninstitutional population age 16 and older of 260 million – about 0.04%.
- Each person in the survey represents about 2,500 people in the population.

How do we go from 0.04% to 100%?

- Survey results are weighted by state, age, sex, race, ethnicity.
- But population targets have to be modeled between Decennial Censuses.
Unemployment Rate – What Are We Measuring?

A person is unemployed if they are…

• Not working and available for work in the week that includes the 12th.
• Engaged in “active job search” in the prior four weeks OR on temporary layoff

Some issues:

• “Active job search” is arbitrary
• More newly employed were previously “not in labor force” than unemployed
• Doesn’t capture underemployment
• Misclassification of workers on temporary layoff
Unemployment Rate – What Does It Tell Us?

Q. When the unemployment rate goes down, is that good or bad?
Unemployment Rate – What Does It Tell Us?

Q. When the unemployment rate goes down, is that good or bad?

A. It depends:

• Good if unemployed persons became employed
• Bad if unemployed persons stopped “active job search” and exited the labor force:

“The unemployment rate fell to 6.3% in January from 6.7% a month earlier, in part reflecting fewer people searching for jobs.”

- Wall Street Journal, February 5, 2021
Unemployment Rate – Pros and Cons

Pros:
• Very useful concept
• Not very noisy
• Minimal revisions and seasonal adjustment
• Straightforward interpretation of level

Cons:
• Concept is difficult to define and measure
• Interpretation of changes is ambiguous
Wall Street Journal, December 5, 2020:

“Employers added 245,000 jobs last month, down from 610,000 jobs in October, the Labor Department reported Friday. The unemployment rate edged down slightly to 6.7% in November from 6.9% a month earlier.”
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“Employers added 245,000 jobs last month, down from 610,000 jobs in October, the Labor Department reported Friday. The unemployment rate edged down slightly to 6.7% in November from 6.9% a month earlier.”

Wall Street Journal, April 2, 2021:

“U.S. employers added a seasonally adjusted 916,000 jobs in March, the best gain since August, the Labor Department said Friday, and the unemployment rate, determined by a separate survey, fell to 6.0%”
2. Tracking the economy in real time
The Real-Time Data Revolution

Private entities opened up the data vaults in 2020:

• Mobile device location data
• Enterprise services software
• Payroll and earnings management services
• Payments platforms

Daily frequency, geographic detail, available in near-real-time
The Real-Time Data Revolution

In the United States, as of March 10, 2021, employment rates among workers in the bottom wage quartile decreased by 27.9% compared to January 2020 (not seasonally adjusted).
Drawbacks of Nontraditional Data Sources

Sample composition is opaque, not representative, inconsistent over time

Daily data for small geographic units → very noisy

Many imperfect proxies for a true variable of interest
Real-Time Measurement of Employment

Types of indicators for employment:

• hours recorded by employer
• earnings reported by employee
• time spent at “workplaces”
• web searches (UI, hiring forms)

Sources: Intuit, Earnin, Kronos, SafeGraph, Google Mobility, Google Trends, Homebase
Four Daily Employment Indicators for Philadelphia
Constructing a Real-Time Employment Tracker

We construct county-level indexes of daily employment:

1. Normalize all indicators relative to pre-pandemic “normal” (by day of the week)

2. Take the first principal component of all indicators

3. Scale to official (monthly) employment
Principal Components Analysis

Relatively simple dimensionality reduction method

The “first principal component” is the weighted average of indicators that best summarizes the information in all of them

• Extracts the latent common signal across all indicators
• Filters out idiosyncratic variation and noise
• Weights on each indicator are county-specific
Scaling to the Target Variable

PCA produces a unitless daily index → rescale mean and standard deviation so they match official monthly employment

Mean level and variance are given, but shape and change over time reflect the underlying indicators
PWBM Employment Index vs. Official Employment Level

Daily employment index (7-day average)  Monthly employment (BLS)
Other Applications

Social distancing
- device proximity
- common locations
- time spent at “home”
- distance travelled

Daily GDP
- employment indicators
- commercial visits
- card transactions
- businesses open or closed
- air quality
- more...
3. Forecasting revenue from tax changes
Types of Revenue Estimates

- “Wicked Static”
  - Base of Tax remains unchanged

- Conventional
  - Includes Behavioral Responses

- Dynamic (not discussed today)
  - Includes Macroeconomic feedbacks
Gasoline Tax Example
Flexibility of Income

• Intertemporal Shift
  • Capital Gains

• Base Shift
  • Choice of Entity

• Flavor Shift
  • Capital vs. Labor

• Combination
Pass-Through vs. C-Corporation

A Firm’s choice of business structure is likely a function of both tax and non-tax concerns.

- **C-corporations**: double taxation, limited liability, broad access to capital markets, deferral.
- **Sole Proprietors**: single layer of tax but includes Self Employment Contributions Act (SECA) rates
- **S-Corporations**: single layer of tax, limited liability, some income avoids SECA, subject to closely held rules
- **Partnerships**: single layer of tax (individual partners), limited liability, some income avoids SECA, flexibility in distribution/form.
Ease of Conversion

• Check-the-Box rules allow Pass-Throughs to choose taxation under the corporate system.

• Corporate Taxation is simpler than Partnership

• Conversion to C-corporation is largely costless

• Conversion to Pass-Through is *not* costless
Tax Rates of Types of Businesses

Tax wedge between the corporate and individual tax base is:

\[ W = T_{\text{net corp}} - T_{\text{ind}} \]

Where:

\[ T_{\text{net corp}} = T_{\text{corp}} + (1 - T_{\text{corp}}) \cdot (\alpha \cdot T_{\text{div}} + (1 - \alpha) \cdot \beta \cdot T_{\text{cg}}) \]

\[ \alpha = \text{share of corporate income paid out as dividends} \]
\[ \beta = \text{a measure of the benefits of capital gains deferral} \]
<table>
<thead>
<tr>
<th>Table 1: Top Statutory Tax Rates in 2017 and 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% Retained</td>
</tr>
<tr>
<td>2017</td>
</tr>
<tr>
<td>Type of Tax</td>
</tr>
<tr>
<td>C-corporation</td>
</tr>
<tr>
<td>Entity Tax</td>
</tr>
<tr>
<td>Individual Tax</td>
</tr>
<tr>
<td>Net Investment Income Tax</td>
</tr>
<tr>
<td>Net Rate</td>
</tr>
<tr>
<td>Rate Differential</td>
</tr>
<tr>
<td>100% Retained</td>
</tr>
<tr>
<td>2017</td>
</tr>
<tr>
<td>Entity Tax</td>
</tr>
<tr>
<td>Individual Tax</td>
</tr>
<tr>
<td>Net Investment Income Tax</td>
</tr>
<tr>
<td>Net Rate</td>
</tr>
<tr>
<td>Rate Differential</td>
</tr>
</tbody>
</table>
Tax Rate Differential – 52% Retained
Tax Rate Differential – 52% Retained
Tax Rate Differential – 52% Retained
Observations

• Not everyone optimizes their Tax Position

• 235,780 of 24.4M “Business Owners”

• 77% of beneficiaries > $500K in AGI

• 17.5% of Pass-Through Ordinary Business Income
Gross Domestic Product

Prepared by the Bureau of Economic Analysis (BEA) as part of the National Income and Product Accounts (NIPAs)

Quarterly estimates, released one month after the end of the quarter

Additional detail for the quarter released over subsequent months
Gross Domestic Product – Definition

BEA: The market value of goods and services produced by labor and property in the United States, regardless of nationality.
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BEA: The market value of \textit{goods and services produced} by labor and property in the United States, regardless of nationality.

“Product”

- “Real” economic activity $\rightarrow$ financial activity is irrelevant
- Current production $\rightarrow$ existing goods or assets are irrelevant
- Production, not sales $\rightarrow$ should include the value of goods and services produced, even if not actually sold
Gross Domestic Product – Definition

BEA: The market value of goods and services produced by labor and property in the United States, regardless of nationality.

“Domestic”

- Production occurring within the 50 states and DC (plus military installations and embassies)
- Contrast with Gross National Product: production by labor and property supplied by U.S. residents, regardless of where it occurs
**Gross** Domestic Product – Definition

BEA: *The market value of goods and services produced by labor and property in the United States, regardless of nationality.*

“Gross”

- Not adjusted to reflect *depreciation*, the reduction in the value of property as a result of their use in production.
- Contrast with **Net** Domestic Product: GDP minus depreciation.
Gross Domestic Product – Sources

Anything they can get their hands on:

- Surveys (manufacturing, wholesale and retail trade, services, construction…)
- Administrative data (tax returns, UI system, utilities, building permits, customs, government spending and revenues…)
- Benchmark: Economic Census
Gross Domestic Product – Sources

Anything they can get their hands on:

• Surveys (manufacturing, wholesale and retail trade, services, construction…)

• Administrative data (tax returns, UI system, utilities, building permits, customs, government spending and revenues…)

• Benchmark: Economic Census

Better source data is incorporated into earlier estimates as it becomes available → quality of GDP estimate increases over time (revisions), impact of models/projections decreases
Gross Domestic Product – What Are We Measuring?

GDP is the sum of producers’ value added:

\[ GDP = \text{Gross Output} - \text{Intermediate Inputs} \]

Some issues:

- Inputs vs. assets
- Nominal vs. real
- Imputed output
Gross Domestic Product – Inputs vs. Assets

Intermediate inputs: Goods and services that are used in the production process of other goods and services.

Fixed assets (property): Produced assets that are used repeatedly, or continuously, in processes of production for an extended period of time.
Gross Domestic Product – Inputs vs. Assets

Reclassified in 2013 from intermediate inputs to fixed assets: R&D, movies and TV, music, books → GDP “increased” more than 2.5%
Gross Domestic Product – Inputs vs. Assets

Reclassified in 2013 from intermediate inputs to fixed assets: R&D, movies and TV, music, books → GDP “increased” more than 2.5%

Soloveichik (2013):
Gross Domestic Product – Nominal vs. Real

Nominal GDP is the market value of goods and services in current dollars. But the quantity is what matters for economic activity and for living standards.

How to aggregate quantities of different goods and services?
Gross Domestic Product – Nominal vs. Real

Nominal GDP is the market value of goods and services in current dollars. But the quantity is what matters for economic activity and for living standards.

How to aggregate quantities of different goods and services?

• Not feasible, but can track change over time in a quantity index
• For most goods and services, BEA estimates a price index and “deflates” the nominal value
• Indexes must account for changes in quality → lots of models
• Quantity indexes are aggregated using expenditure shares → also a model
The American Families Plan: Taxes

AFP raises taxes on high income individuals

- **Individual taxes on ordinary income**
  - Raise the top individual rate to 39.6 percent

- **Capital gains taxes**
  - Tax unrealized capital gains above $1 million at death
  - Tax LTCG/Dividends at ordinary rates for individuals making more than $1 million
  - Tax carried interest at ordinary rates
  - Disallow deferral of tax on like-kind exchanges for gains greater than $500,000

- **Pass-through business taxes**
  - Make all income above $400,000 face 3.8%
  - Extend the limitation of business losses for noncorporate taxpayers
The American Families Plan: Taxes

AFP dedicates resources towards IRS enforcement

- Additional audits
- IT modernization
- New information reporting aimed at deterring evasion in pass-through businesses
- Taxpayer services
The American Families Plan: Taxes

AFP extends certain tax credit expansions under the recent stimulus:

- Child Tax Credit, through 2025
  - Remove refundability rules past 2025
- Premium Tax Credit
- Earned Income Tax Credit
- Child and Dependent Care Credit
<table>
<thead>
<tr>
<th>Provision</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>2031</th>
<th>10 year total</th>
<th>15 year total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raise the top rate on ordinary income to 39.6%</td>
<td>17</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>16</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>111</td>
<td>111</td>
</tr>
<tr>
<td>Tax unrealized gains above $1M at death; tax long-term capital gains and preferred dividends at ordinary rates for filers making more than $1M; tax carried interest at ordinary rates</td>
<td>9</td>
<td>23</td>
<td>31</td>
<td>37</td>
<td>39</td>
<td>40</td>
<td>44</td>
<td>46</td>
<td>51</td>
<td>55</td>
<td>376</td>
<td>699</td>
</tr>
<tr>
<td>Disallow deferral of tax on like-kind exchanges for gains greater than $500,000</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>41</td>
<td>68</td>
</tr>
<tr>
<td>Ensure all income above $400,000 faces 3.8% Medicare tax</td>
<td>10</td>
<td>14</td>
<td>15</td>
<td>17</td>
<td>13</td>
<td>13</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>15</td>
<td>139</td>
<td>222</td>
</tr>
<tr>
<td>Extend limitation on business losses for noncorporate taxpayers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>32</td>
<td>33</td>
<td>35</td>
<td>36</td>
<td>162</td>
<td>362</td>
</tr>
<tr>
<td>Increase IRS funding for audits; institute information reporting regime for gross flows in financial institutions</td>
<td>2</td>
<td>5</td>
<td>11</td>
<td>20</td>
<td>30</td>
<td>43</td>
<td>59</td>
<td>78</td>
<td>101</td>
<td>129</td>
<td>480</td>
<td>1359</td>
</tr>
<tr>
<td><strong>Total budget effect of revenue-raisers</strong></td>
<td>40</td>
<td>69</td>
<td>85</td>
<td>103</td>
<td>103</td>
<td>130</td>
<td>155</td>
<td>176</td>
<td>205</td>
<td>241</td>
<td>1308</td>
<td>2821</td>
</tr>
<tr>
<td>Extend the ARP’s expansion of the Child Tax Credit through 2025; remove refundability requirements permanently</td>
<td>-78</td>
<td>-107</td>
<td>-108</td>
<td>-112</td>
<td>-30</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-439</td>
<td>-443</td>
</tr>
<tr>
<td>Extend the ARP’s expansion of the Earned Income Tax Credit for childless workers</td>
<td>-9</td>
<td>-12</td>
<td>-12</td>
<td>-12</td>
<td>-13</td>
<td>-13</td>
<td>-13</td>
<td>-13</td>
<td>-14</td>
<td>-14</td>
<td>-125</td>
<td>-199</td>
</tr>
<tr>
<td>Extend the ARP’s expansion of the Premium Tax Credit</td>
<td>-24</td>
<td>-33</td>
<td>-35</td>
<td>-36</td>
<td>-38</td>
<td>-39</td>
<td>-41</td>
<td>-42</td>
<td>-44</td>
<td>-46</td>
<td>-378</td>
<td>-629</td>
</tr>
<tr>
<td>Extend the ARP’s expansion of the Child and Dependent Care Tax Credit</td>
<td>-6</td>
<td>-8</td>
<td>-9</td>
<td>-9</td>
<td>-9</td>
<td>-10</td>
<td>-10</td>
<td>-10</td>
<td>-11</td>
<td>-11</td>
<td>-92</td>
<td>-152</td>
</tr>
<tr>
<td><strong>Net budget effect of tax-related provisions</strong></td>
<td>-77</td>
<td>-91</td>
<td>-79</td>
<td>-67</td>
<td>13</td>
<td>68</td>
<td>90</td>
<td>110</td>
<td>137</td>
<td>170</td>
<td>275</td>
<td>1398</td>
</tr>
</tbody>
</table>
### AFP: Outlays (Billions of $), 2022 - 2036

<table>
<thead>
<tr>
<th>Provision</th>
<th>2022-2031</th>
<th>2022-2036</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free, universal pre-kindergarten for all three- and four-year-olds</td>
<td>426</td>
<td>671</td>
</tr>
<tr>
<td>Tuition-free two-year community college</td>
<td>299</td>
<td>497</td>
</tr>
<tr>
<td>Increase Pell Grants for low-income students</td>
<td>66</td>
<td>104</td>
</tr>
<tr>
<td>Other education initiatives</td>
<td>117</td>
<td>191</td>
</tr>
<tr>
<td>Family and childcare initiatives</td>
<td>493</td>
<td>806</td>
</tr>
<tr>
<td>Child Tax Credit expansion</td>
<td>439</td>
<td>443</td>
</tr>
<tr>
<td>Earned Income Tax Credit expansion</td>
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<tr>
<td>Premium Tax Credit expansion</td>
<td>378</td>
<td>629</td>
</tr>
<tr>
<td>Child and Dependent Care Tax Credit expansion</td>
<td>92</td>
<td>152</td>
</tr>
<tr>
<td>IRS funding</td>
<td>80</td>
<td>176</td>
</tr>
<tr>
<td><strong>Total spending</strong></td>
<td><strong>2515</strong></td>
<td><strong>3868</strong></td>
</tr>
</tbody>
</table>
Macroeconomic Effects, AFP Tax Increases Alone

First, the macroeconomic effects of just the tax increases, with no new spending:

- Increased taxes on investment income discourages households from saving.
- Raised tax revenue reduces government debt and crowds in capital investment.

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP</th>
<th>Capital</th>
<th>Average Hourly Wage</th>
<th>Hours Worked</th>
<th>Debt Held by the Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>2031</td>
<td>0.01%</td>
<td>0.79%</td>
<td>0.33%</td>
<td>-0.32%</td>
<td>-4.10%</td>
</tr>
<tr>
<td>2040</td>
<td>0.09%</td>
<td>0.94%</td>
<td>0.41%</td>
<td>-0.32%</td>
<td>-5.90%</td>
</tr>
<tr>
<td>2050</td>
<td>0.29%</td>
<td>1.44%</td>
<td>0.54%</td>
<td>-0.24%</td>
<td>-7.03%</td>
</tr>
</tbody>
</table>
The American Families Plan: Spending

AFP proposal includes about $2.2 trillion in spending through 2030:

• ~$1.0 T of the AFP through 2030 goes toward productivity-increasing educational spending.

• The other ~$1.2T of the AFP goes toward various tax credits and transfers to qualifying households, which includes:
  • Child Tax Credit
  • Extending the ACA premiums tax credit
  • Several health and nutrition programs
Macroeconomic Effects, AFP Spending Alone

Macroeconomic effects of just the new spending (with no tax increases), assuming the AFP spending begins in 2022 and is fully deficit-financed:

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP</th>
<th>Capital</th>
<th>Average Hourly Wage</th>
<th>Hours Worked</th>
<th>Debt Held by the Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>2031</td>
<td>-0.33%</td>
<td>-0.86%</td>
<td>0.05%</td>
<td>-0.39%</td>
<td>6.22%</td>
</tr>
<tr>
<td>2040</td>
<td>-0.44%</td>
<td>-1.59%</td>
<td>-0.15%</td>
<td>-0.28%</td>
<td>9.41%</td>
</tr>
<tr>
<td>2050</td>
<td>-0.68%</td>
<td>-2.58%</td>
<td>-0.46%</td>
<td>-0.22%</td>
<td>11.56%</td>
</tr>
</tbody>
</table>

Notice that productivity increases from the new investments are outweighed by *crowding out* from higher deficits.
Macroeconomic Effects, Full AFP Proposal (Taxes and Spending)

Now the *combined* effects of the AFP's education expenditures including productivity boosts, transfers, tax changes, investment effects of taxes, and debt crowding out effects:

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP</th>
<th>Capital</th>
<th>Average Hourly Wage</th>
<th>Hours Worked</th>
<th>Debt Held by the Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>2031</td>
<td>-0.34%</td>
<td>-0.09%</td>
<td>0.41%</td>
<td>-0.75%</td>
<td>2.16%</td>
</tr>
<tr>
<td>2040</td>
<td>-0.36%</td>
<td>-0.67%</td>
<td>0.26%</td>
<td>-0.62%</td>
<td>3.54%</td>
</tr>
<tr>
<td>2050</td>
<td>-0.39%</td>
<td>-1.16%</td>
<td>0.12%</td>
<td>-0.50%</td>
<td>4.55%</td>
</tr>
</tbody>
</table>