

Economics 442
Macroeconomic Policy

Lecture 5
9/21/2020

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UW Madison
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Outline

- Recap: Portfolio Crowding Out
- Evidence: Gov't Debt & Interest Rates
- Evidence: Gov't Spending/Transfers and GDP

Recap:

Recap

Portfolio Crowding Out

Modified IS-LM

$$(12) \quad Y = \left(\frac{1}{1-c_1-b_1} \right) [\Lambda_0 - b_2 i] \quad \langle \text{IS curve} \rangle$$

where $\Lambda_0 \equiv c_0 - c_1(t_0) + b_0 + GO_o$.

- Marginal tax rate set to zero
- Money demand depends on wealth (money base and bonds)

$$(4) \quad \frac{M^d}{P} = \mu_0 + Y - hi + j \left(\frac{MB_0 + B_0}{P} \right)$$

$$(5) \quad i = \frac{\mu_0}{h} - \left(\frac{1}{h} \right) \left(\frac{mMB_0}{P_0} \right) + \underbrace{\frac{j}{h} \left(\frac{MB_0}{P_0} + \frac{B_0}{P_0} \right)}_{\text{Real wealth to the private sector}} + \left(\frac{1}{h} \right) Y \quad \langle \text{revised LM} \rangle$$

Real wealth to the private sector

Equilibrium

- If central bank targets the money base – and hence money supply – then


$$(6) \quad Y_0 = \hat{\gamma} \left[\Lambda_0 + \frac{b_2}{h} \left(\frac{mMB_0}{P_0} \right) - \frac{b_2 j}{h} \left(\frac{MB_0}{P_0} + \frac{B_0}{P_0} \right) - \frac{b_2 \mu_0}{h} \right]$$

- If initially budget balance, then:

$$(8') \quad BuD_0 = GO_0 - t_0 = 0$$

- Take total differential, no monetary policy

$$(10) \quad \Delta Y = \hat{\gamma} \left[\Delta \Lambda + \frac{b_2 m}{h} \Delta \left(\frac{MB}{P} \right) - \frac{b_2 j}{h} \Delta \left(\frac{MB}{P} + \frac{B}{P} \right) - \frac{b_2 \Delta \mu}{h} \right]$$



 ΔGO

Equilibrium

$$\Delta Y = \hat{\gamma} \left[\Delta GO - \frac{b_{2j}}{h} \Delta \left(\frac{B}{P} \right) \right]$$

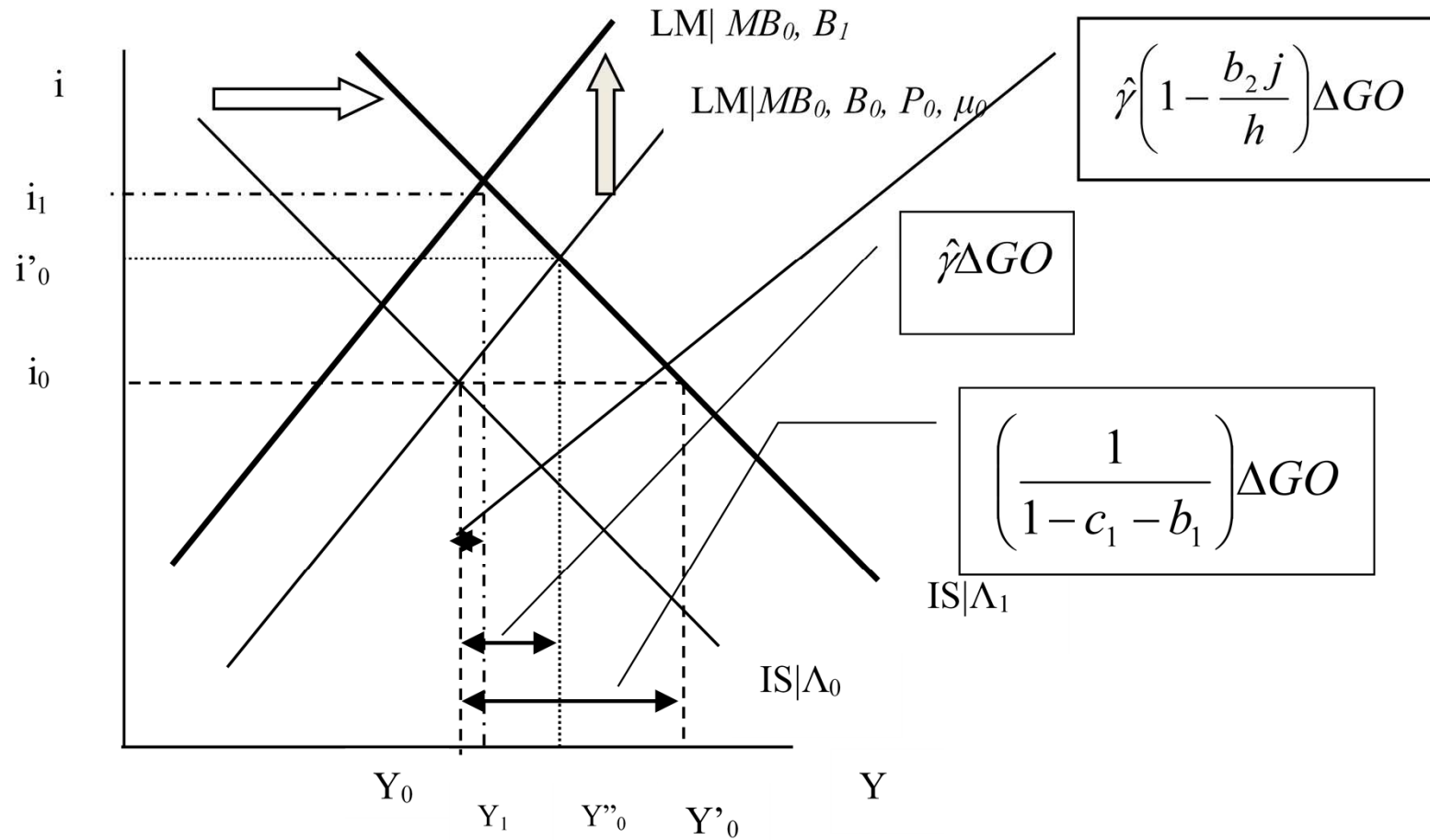
- New budget deficit, must be financed

$$(8'') \quad \text{Bud}_1 = \Delta GO + \underbrace{GO_0 - t_0}_{= 0} = \Delta(B/P)$$

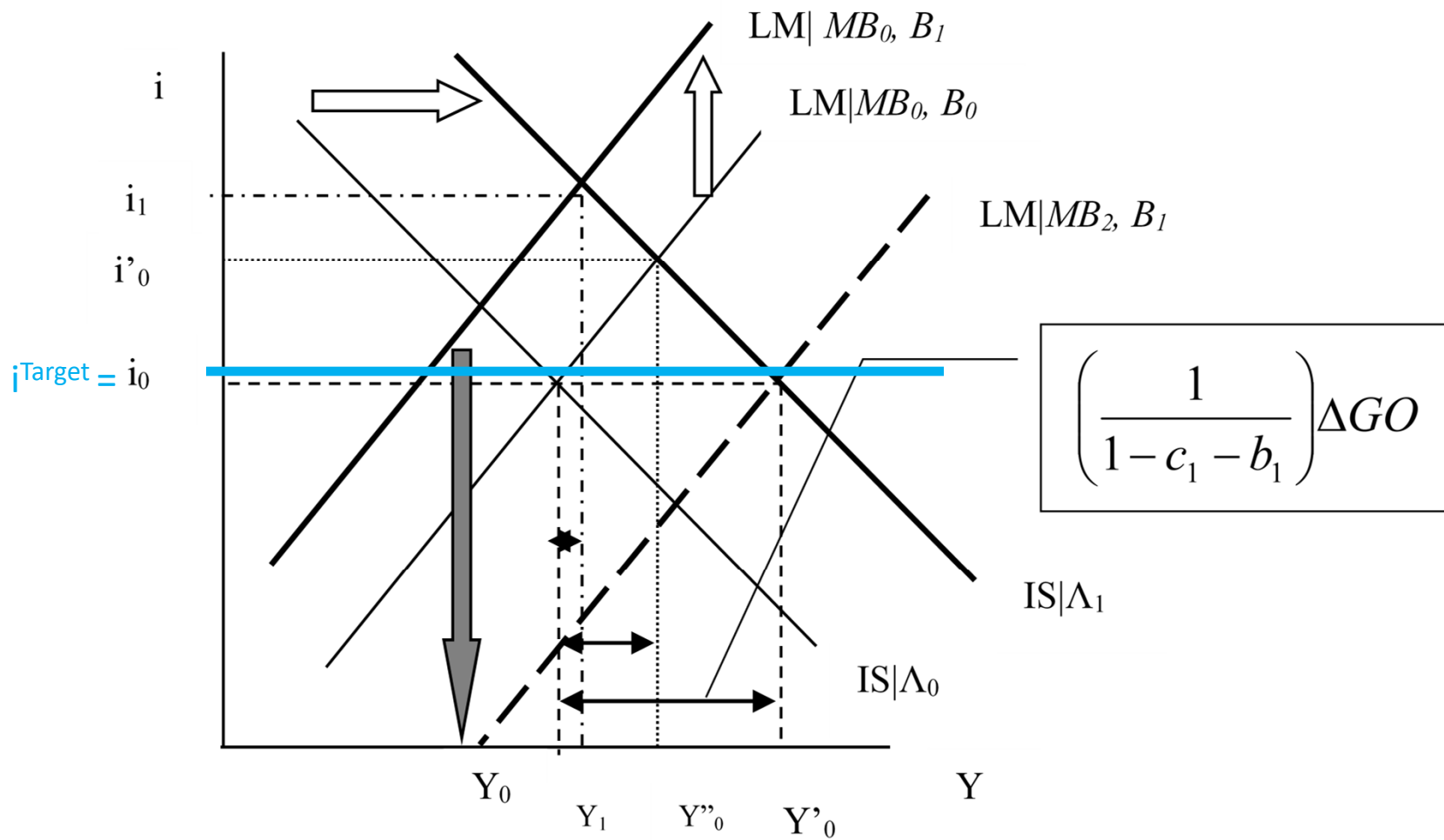
$$(9) \quad \Delta GO = \Delta(B/P)$$

$$(11) \quad \Delta Y = \hat{\gamma} \left[\Delta GO - \frac{b_{2j}}{h} \Delta GO \right]$$

Equilibrium (M targeted)



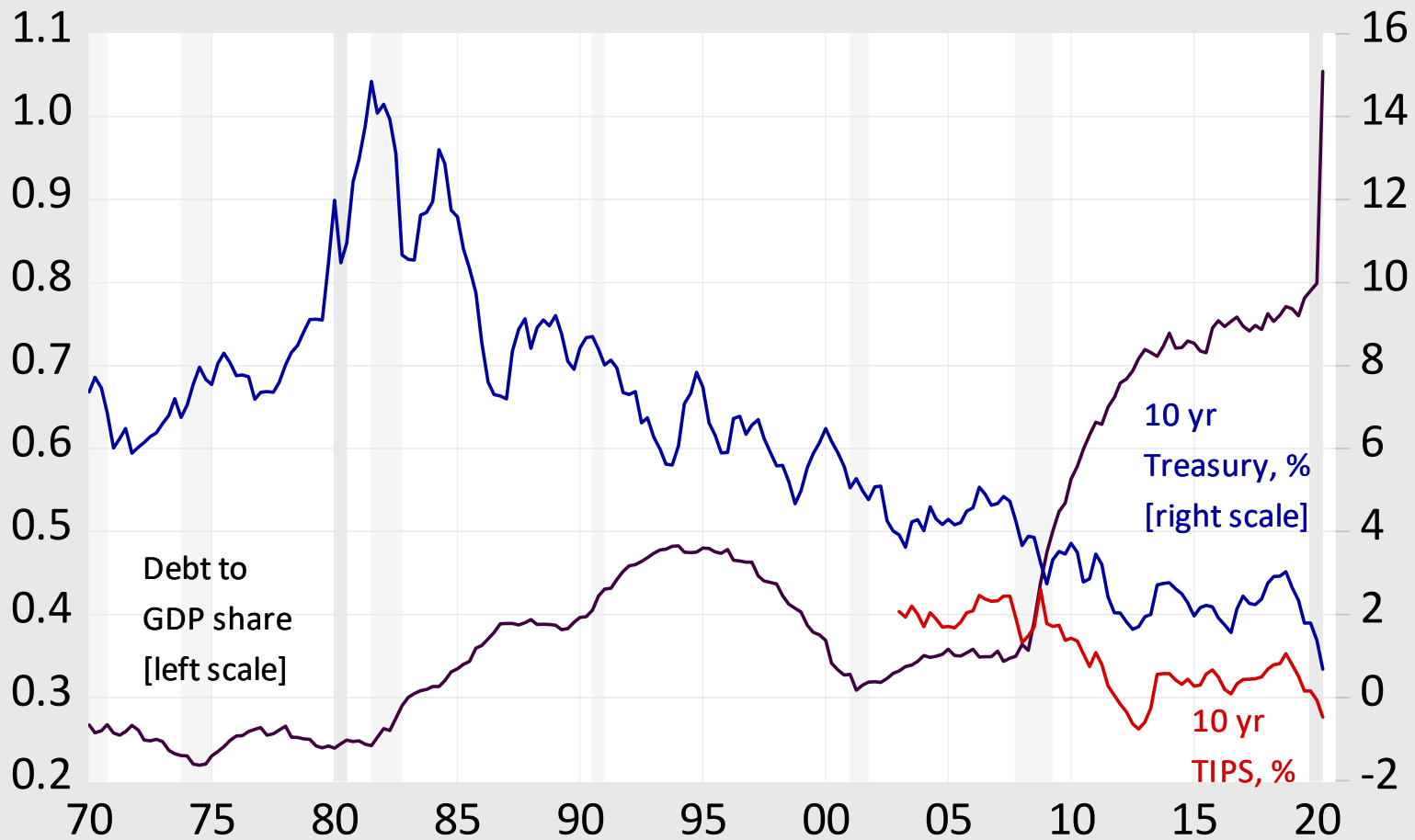
Equilibrium (interest rate targeting)



Evidence

Gov't Debt & Interest Rates

Evidence



Term Spread (10yr-3mo)

$$\text{SPREAD}_t = \beta_0 + \beta_1 \text{UNGAP}_t + \beta_2 \text{INFL}_t + \beta_3 \text{STRSURP}_t + \beta_4 \text{FOROFFICIAL}_t + \beta_5 \text{FEDLT}_t + e_t, \quad (3)$$

Table 1: Regression Results for the Treasury Interest Rate Term Spread, Ten-Years and Three Months

	C	UNGAP	INFL	STRSURP	FOROFFICIAL	FEDLT	DISCMPOL	Adj. R^2	DW	SE	AIC	F
1	1.373** (0.278)	0.416** (0.143)	-0.276** (0.072)	-0.190* (0.106)				0.553	1.29	0.823	2.56	
2	1.435** (0.269)	0.481** (0.142)	-0.383** (0.090)	-0.291** (0.116)	-0.445* (0.243)			0.588	1.66	0.790	2.51	
3	1.358** (0.238)	0.648** (0.137)	-0.407** (0.080)	-0.293** (0.102)	-0.147 (0.237)	-0.561** (0.189)		0.680	1.89	0.680	2.28	0.80
4	1.331** (0.191)	0.565** (0.091)	-0.420** (0.070)		-0.349** (0.086)			0.685	1.91	0.691	2.22	
5	1.265** (0.238)	0.608** (0.135)	-0.385** (0.079)	-0.306** (0.099)	-0.254 (0.239)	-0.442** (0.198)	0.748 (0.461)	0.699	1.94	0.675	2.24	0.18
6	1.223** (0.188)	0.557** (0.086)	-0.382** (0.069)		-0.335** (0.082)		0.847** (0.413)	0.717	1.96	0.655	2.13	

Note: Ordinary least squares, sample 1979–2010.

Standard errors are in parentheses; **significant at the 0.05 level; *significant at the 0.10 level.

DW, Durbin–Watson statistic; SE, standard error of the regression; AIC, Akaike information criterion.

F is the test value for the Wald test for the null hypothesis of equality of the coefficients on STRSURP, FOROFFICIAL and FEDLT.

Updated Kitchen-Chinn (thru 2016)

Dependent Variable: SPREAD

Method: Least Squares

Date: 09/20/20 Time: 15:43

Sample: 1979Q1 2016Q4

Included observations: 152

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed
bandwidth = 5.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.014199	0.002086	6.808473	0.0000
(UNRATE-UNRATE_NAT)/100	0.323693	0.095588	3.386331	0.0009
(PCEPI/PCEPI(-1))^4-1	-0.178641	0.046088	-3.876125	0.0002
BUSFE_CBO/GDP_POT_CBOJUL20	-0.218536	0.090180	-2.423338	0.0166
D(FOROFFICIAL_LEVEL)*4/(GDP_PO...	-0.094232	0.059837	-1.574821	0.1175
D(TREAS5T301+FEDDT_MBS1)*4/(G...	-0.094321	0.057073	-1.652642	0.1006
DISCMPOL	0.013397	0.001669	8.024319	0.0000
R-squared	0.538042	Mean dependent var	0.018110	
Adjusted R-squared	0.518927	S.D. dependent var	0.012281	
S.E. of regression	0.008518	Akaike info criterion	-6.648340	
Sum squared resid	0.010520	Schwarz criterion	-6.509082	
Log likelihood	512.2738	Hannan-Quinn criter.	-6.591768	
F-statistic	28.14689	Durbin-Watson stat	0.674672	
Prob(F-statistic)	0.000000	Wald F-statistic	21.48010	
Prob(Wald F-statistic)	0.000000			

Updated Kitchen-Chinn (thru 2019)

Dependent Variable: SPREAD

Method: Least Squares

Date: 09/20/20 Time: 01:32

Sample (adjusted): 1979Q1 2019Q3

Included observations: 163 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed
bandwidth = 5.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015044	0.002034	7.396455	0.0000
(UNRATE-UNRATE_NAT)/100	0.363707	0.095099	3.824498	0.0002
(PCEPI/PCEPI(-1))^4-1	-0.174233	0.047523	-3.666311	0.0003
BUSFE_CBO/GDP_POT_CBOJUL20	-0.165659	0.088504	-1.871764	0.0631
D(FOROFFICIAL_LEVEL)*4/(GDP_PO...	-0.083380	0.057419	-1.452125	0.1485
D(TREAS5T301+FEDDT_MBS1)*4/(G...	-0.090798	0.056362	-1.610978	0.1092
DISCMPOL	0.013286	0.001705	7.794167	0.0000
TRUMP	-0.009342	0.005119	-1.824781	0.0700
R-squared	0.537470	Mean dependent var	0.017476	
Adjusted R-squared	0.516581	S.D. dependent var	0.012185	
S.E. of regression	0.008472	Akaike info criterion	-6.656209	
Sum squared resid	0.011126	Schwarz criterion	-6.504369	
Log likelihood	550.4810	Hannan-Quinn criter.	-6.594563	
F-statistic	25.73045	Durbin-Watson stat	0.654150	
Prob(F-statistic)	0.000000	Wald F-statistic	19.99455	
Prob(Wald F-statistic)	0.000000			

Evidence

Gov't Spending & Transfers
& GDP

What Are Gov't Transfers?

- Gov't spending on goods & services (G), e.g., tanks, pay civil servants
- Gov't transfers (Tr), e.g., unemployment insurance payments, food stamps/SNAP, social security payments
- Tr are the negative of taxes (T)
- Tr increase disposable income (Y_D), then affect C and hence $Y (= GDP)$

Pandemic Response: Mostly Increased Transfers

Table 1.

The Effects of Pandemic-Related Legislation on the Deficit

Billions of Dollars

	2020	2021	2022	2023	Total	
					2020–2023	2024–2030
Paycheck Protection Program and Related Provisions ^a	616	13	0	0	628	0
Enhanced Unemployment Compensation	370	71	0	0	442	0
Recovery Rebates for Individuals ^b	272	20	0	0	292	0
Direct Assistance for State and Local Governments	150	*	0	0	150	0
Other Spending Provisions ^c	359	218	101	21	700	13
Other Revenue Provisions ^d	539	253	-186	-182	425	-50
Federal Reserve's Emergency Lending Facilities	11	0	0	0	11	0
Total	2,317	576	-85	-160	2,648	-37

Sources: Congressional Budget Office; staff of the Joint Committee on Taxation.

The years shown are federal fiscal years.

Positive numbers indicate an increase in the deficit.

Because of rounding, values in this table may not correspond precisely to values in Congressional Budget Office, *An Update to the Budget Outlook: 2020 to 2030* (September 2020), www.cbo.gov/publication/56517. In addition, for the purposes of this analysis, to account for the estimated outlays of Public Law 116-123, CBO used its cost estimate for H.R. 6074, the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020 (March 4, 2020), www.cbo.gov/publication/56227. In contrast, CBO's baseline budget projections incorporate funding for 2020 provided in P.L. 116-123 and adjust it for inflation for each subsequent year through fiscal year 2030.

* = between zero and \$500 million.

Pandemic Response: Mostly Increased Transfers

Table 2.

The Effects of Pandemic-Related Legislation on Real GDP

Percent

Policy	2020				2021				Annual			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2020	2021	2022	2023
Paycheck Protection Program and Related Provisions ^a	0	0.9	1.4	1.0	0.7	0.4	0.2	0.1	0.8	0.3	*	*
Enhanced Unemployment Compensation	0	1.1	1.8	1.5	0.8	0.5	0.3	0.1	1.1	0.4	*	*
Recovery Rebates for Individuals ^b	0	1.1	0.8	0.6	0.6	0.3	0.1	0.1	0.6	0.3	*	*
Direct Assistance for State and Local Governments	0	0.3	0.9	0.8	0.4	0.2	0.1	*	0.5	0.2	*	*
Other Spending Provisions ^c	0	1.2	2.3	1.9	1.8	1.4	1.1	0.7	1.3	1.3	0.4	0.1
Other Revenue Provisions ^d	0	0.4	0.7	0.4	0.3	0.8	0.3	0.2	0.3	0.4	-0.1	-0.1
Federal Reserve's Emergency Lending Facilities	0	*	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.3	*	*
Total	0	5.0	8.1	6.4	5.0	4.0	2.4	1.3	4.7	3.1	0.3	0.1

Memorandum:

Real GDP Without the Effects of the Legislation

Real GDP (Billions of 2012 dollars)	4,744	4,064	4,103	4,250	4,369	4,466	4,596	4,680	17,161	18,112	19,158	19,617
Growth since previous quarter (Percent)	-1.3	-14.3	1.0	3.6	2.8	2.2	2.9	1.8	n.a.	n.a.	n.a.	n.a.
Growth at annualized rates (Percent)	-5.0	-46.2	3.9	15.1	11.7	9.2	12.2	7.5	-10.0	5.5	5.8	2.4

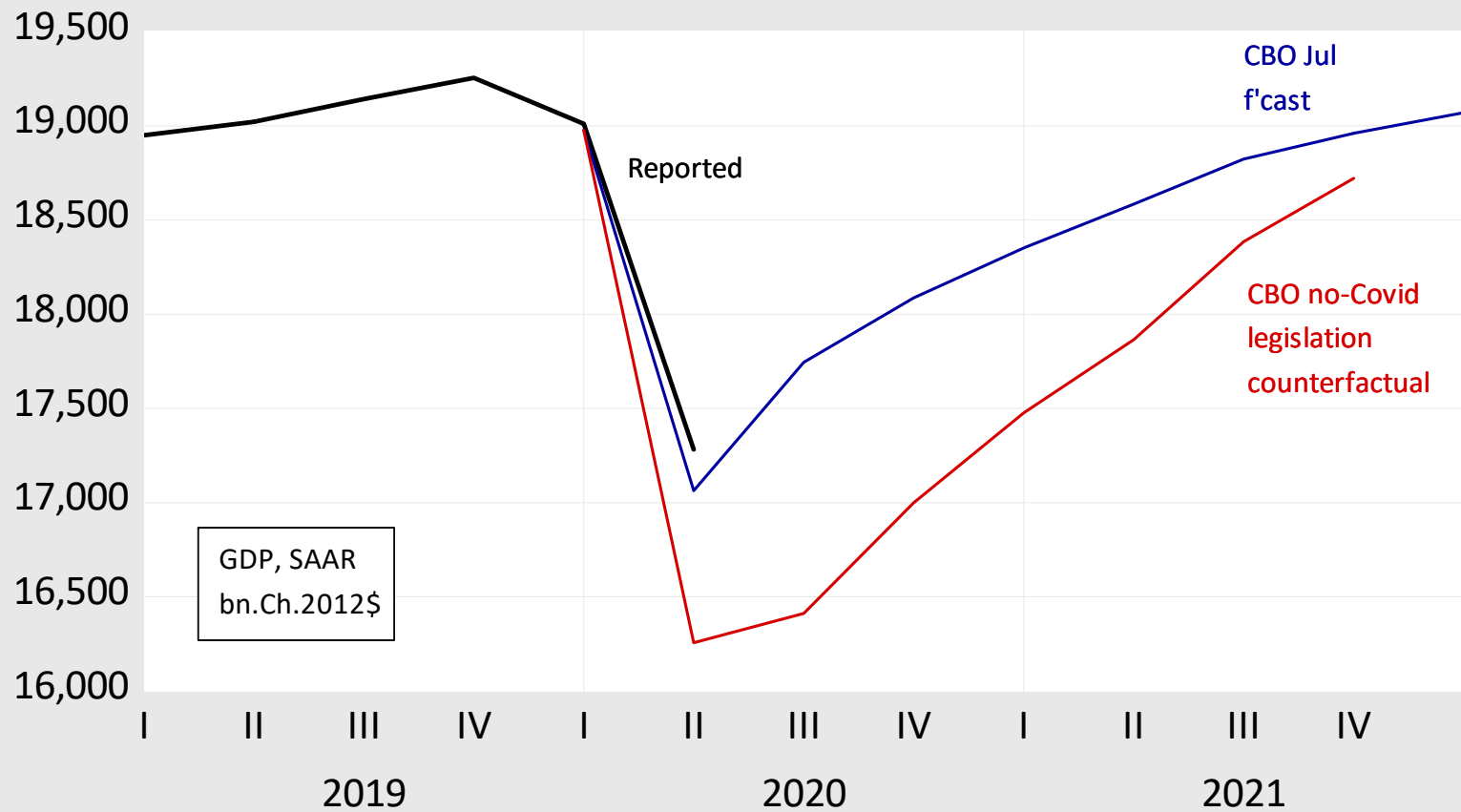
Real GDP in CBO's Current Economic Forecast

Real GDP (Billions of 2012 dollars)	4,744	4,266	4,436	4,522	4,588	4,646	4,706	4,740	17,968	18,679	19,222	19,631
Growth since previous quarter (Percent)	-1.3	-10.1	4.0	1.9	1.5	1.3	1.3	0.7	n.a.	n.a.	n.a.	n.a.
Growth at annualized rates (Percent)	-5.0	-34.6	17.0	7.9	6.0	5.1	5.3	2.9	-5.8	4.0	2.9	2.1

Source: Congressional Budget Office.

These values are presented as a percentage of an implied projection of real GDP that does not include the effects of pandemic-related legislation—a

Impact of Pandemic Response



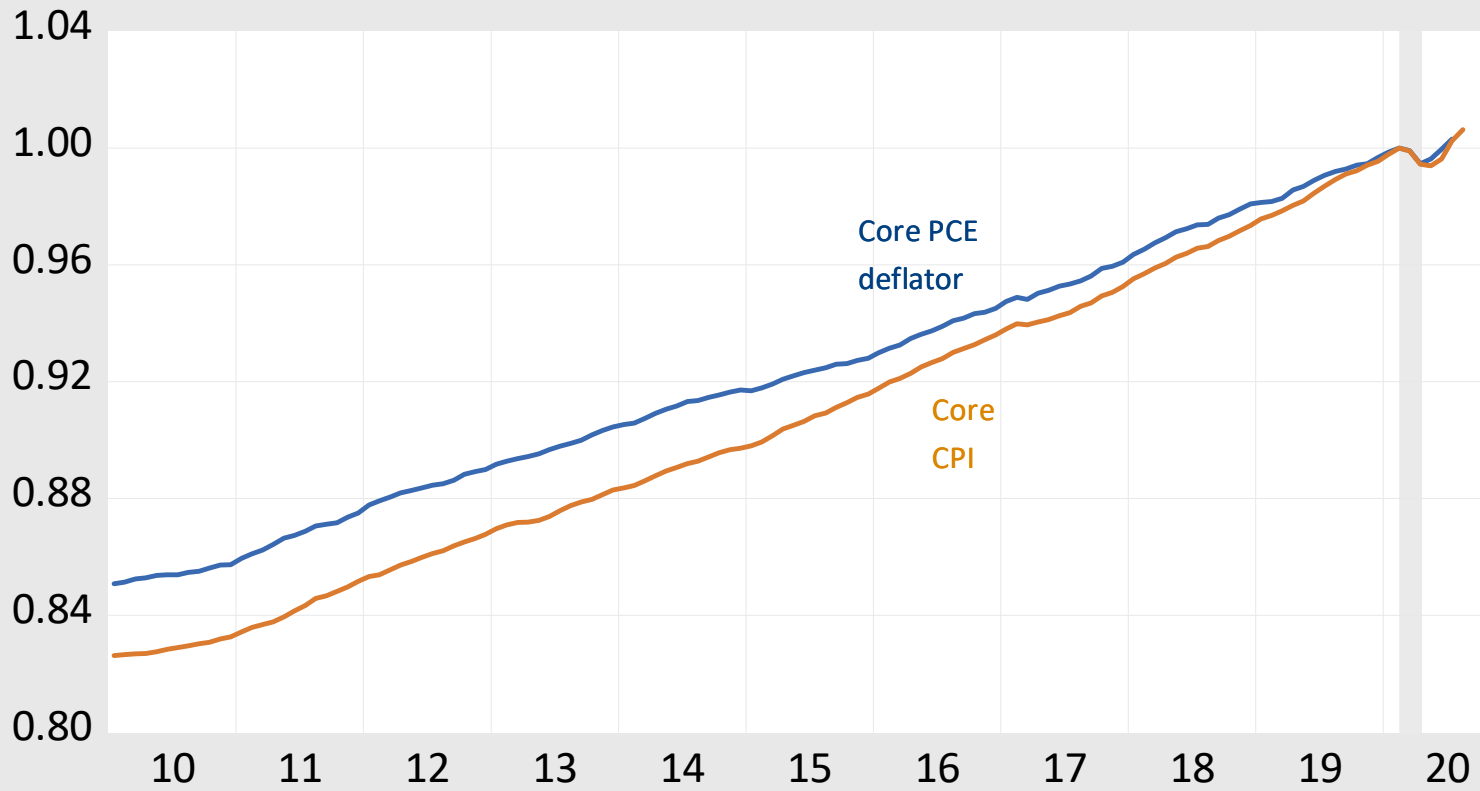
Multipliers

- Paycheck Protection Program (PPP): 0.37
- Enhanced unemployment insurance programs: 0.68
- Recovery rebates for individuals: 0.61
- Direct aid to state & local gov'ts.: 0.89
- Other gov't spending provisions: 0.89
- Other revenue provisions: 0.24

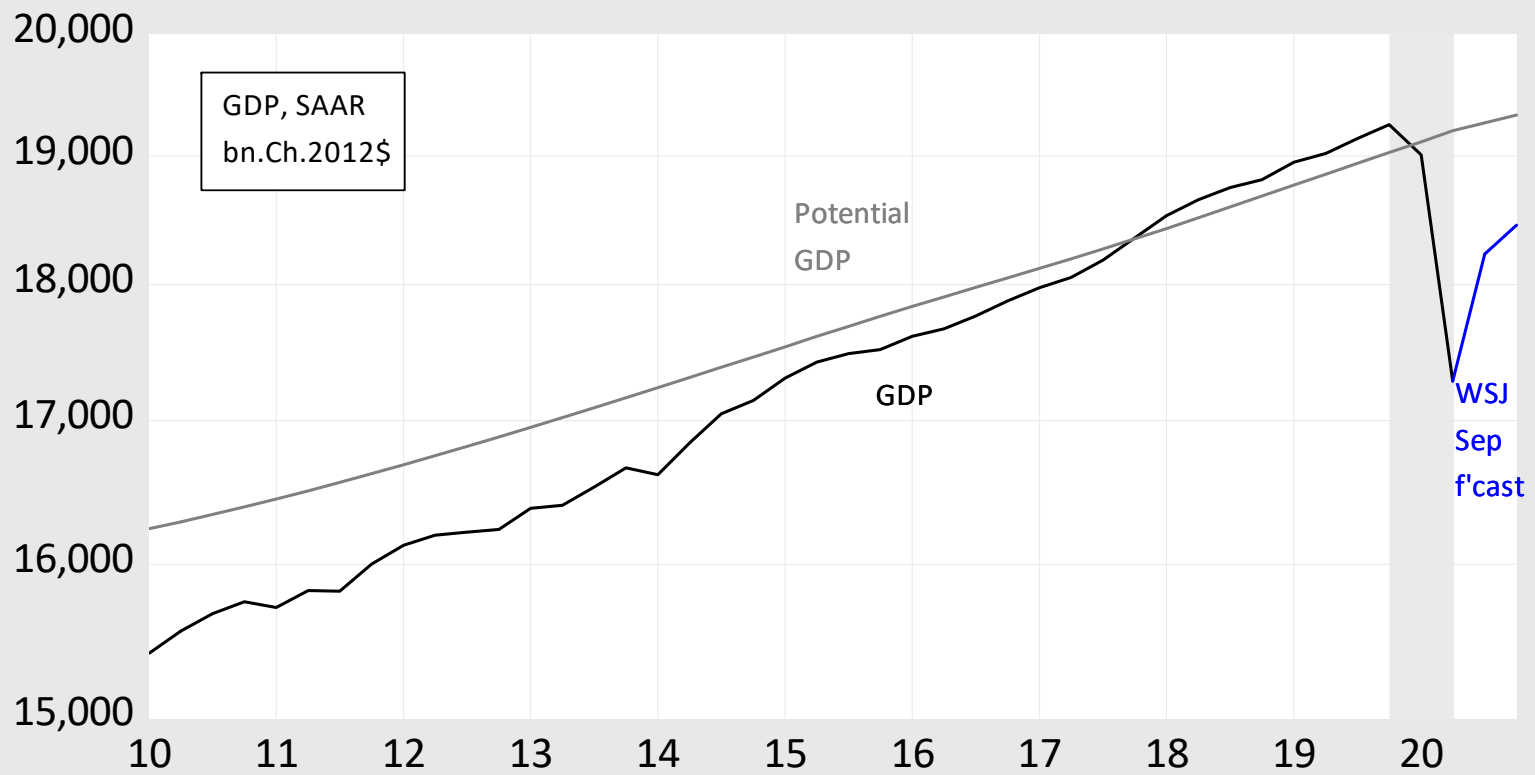
Is This Keynesian Analysis Appropriate?

- Yes: price level has been roughly fixed
- Yes: output is below potential, so there's slack

Quiescent Inflation



Economic Slack



Is This Keynesian Analysis Appropriate?

- No: Potential GDP might be mismeasured with closed (service) sectors