

Does Fiscal Policy Matter? Blinder and Solow Revisited

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What this paper does?

- It answers the following questions using Old-Keynesian model (Farmer (2010)):
 - ① do increased government purchases crowd out private consumption?
 - ② do increased government purchases reduce unemployment?
 - ★ BEFORE Farmer(2010) showed that in the long-run the answer to 1) is “yes” and to 2) is “no”.
 - ★ THIS PAPER shows that with respect a temporary government expansion the answer to 1) is still “yes” but the answer to 2) can be “yes” as well.
- It uses actual data and generates paths in consumption and unemployment that are similar to those occurred before and during WWII.

Outline

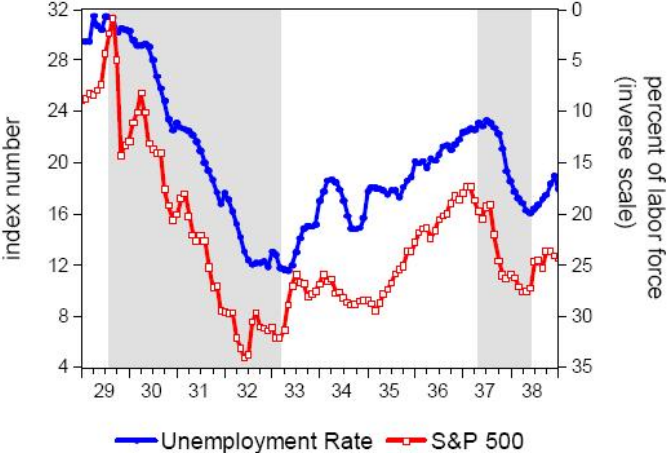
- 1 Introduction
- 2 The model
- 3 Results
- 4 Application to data

The Great Depression

- On Monday October 28th 1929 the stock market fell 13% in one day.
 - ▶ Later unemployment climbed to 25% and remained above 10% for ten years in a row.
- Keynes argued that this drop in confidence on financial markets *caused* the Great Depression
 - ▶ Empirical evidence provided in a paper by Romer (1990)
 - ▶ A theory of how it can be consistent with the data can be found in Farmer (2010)

Data

The Great Depression



The Great Depression

Related literature

- Eighty years later economists are still debating about the causes of the Great Depression.
- Monetary reasons
 - ▶ The Fed failed to prevent a collapse of the money supply (Friedman and Schwartz (1963)).
 - ▶ Banking panics (Bernanke (1983)).
- Real explanantions
 - ▶ Autonomous drop in consumption (Temin (1978)).
 - ▶ Herbert Hoover's labor policies (Ohanian (2009)).
 - ▶ The industrial policy of President Roosevelt's New Deal made an ordinary recession much worse (Cole and Ohanian(2010)).

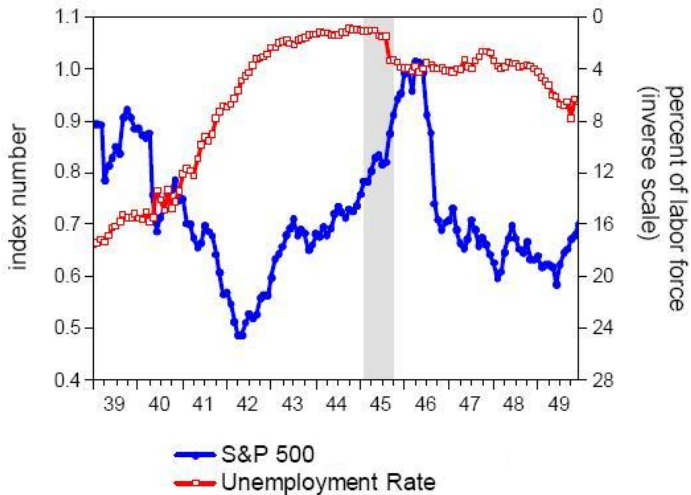
The Great Depression

An Old-Keynesian Interpretation

- In the series of papers Farmer develops an Old-Keynesian model that
 - ▶ is a representative agent model with rational expectations.
 - ▶ does not rely on the assumption of sticky prices.
 - ▶ uses confidence as an independent driving variable that determines the amount that households are willing to pay for assets.
- In that model Farmer showed that
 - ▶ an exogenous drop in confidence shifts the economy from an equilibrium with full employment to a new equilibrium with high unemployment.
 - ▶ If confidence remains for all future periods then a class of stationary balanced budget fiscal policies cannot restore full employment.

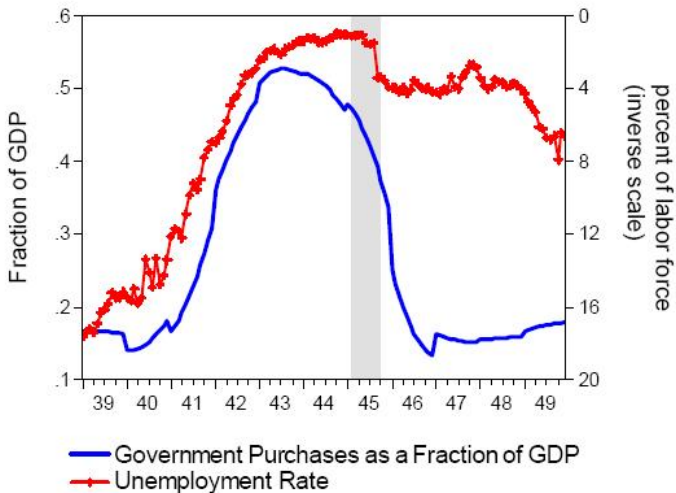
Wartime recovery

Stock market and unemployment are unrelated



Wartime recovery

Fiscal expansion

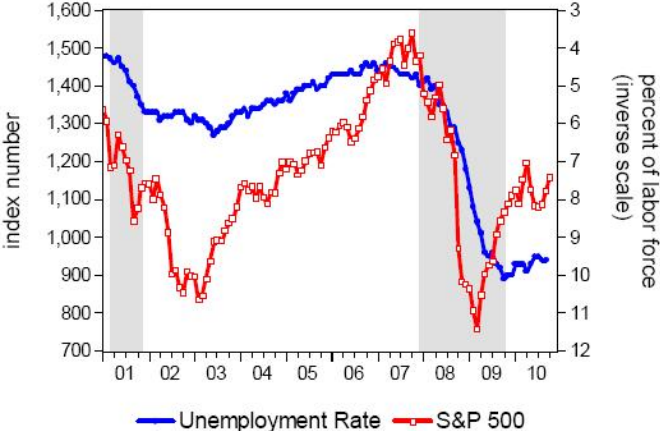


Why it is important

- In 2008 many governments including U.S. increased their deficits in an attempt to stimulate their economies
- In U.S.
 - ▶ In 2008 Economic Stimulus Act provided \$ 125 bln as a stimulus for the economy.
 - ▶ In 2009 the U.S. Congress passed the \$ 787 bln American Recovery and Reinvestment Act for the years 2009-2011 ($\approx 5\%$ of GDP in 2008).
 - ▶ As a result, government debt is expected to rise from 40 % percent in 2008 (33 % in 2001) to 56 % - 80 % in 2019 (Congressional Budget Office (2009))

Data

Recent recession



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2 The model

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The model

Households

- Utility is logarithmic to make the model tractable.
- Each household owns 1 unit of time that they allocate to labor
 - ▶ There is **no disutility from working** \Rightarrow All variation in employment is due to variation in unemployment rate.
- Household can accumulate assets A_t that are sold at time t for the price of Q_t^{t+1} which is the price of a pure discount bond.

The model

Asset markets

- Asset markets are competitive
 - ▶ Assets held by the private sector are liabilities of the financial sector.
 - ▶ The sector owns capital and government bonds.
- Capital is non-reproducible and is fixed at one.
 - ▶ This makes the model similar to a Lucas tree model with variable employment

The model

Technology

- One standard Cobb-Douglas production technology for producing goods that uses labor and capital as inputs.
- **Labor search technology.** Assume that the labor is rehired every period.
 - ▶ If the data is annual \Rightarrow not such a bad assumption
 - ▶ **Not closed with Nash-bargaining solution.** It is problematic (Shimer (2005)).
 - ★ Externality in the recruiting process ($Y_t = F(K_t, L_t, \Omega(L_t))$) and bilateral monopoly problem \Rightarrow Continuum of steady state equilibria (McAfee and Howitt (1987), DMP (1982,1984)).
 - ★ Instead use an assumption that firms produce output to meet aggregate demand.

The model

Summary

- Euler equation(nominal terms)

$$\frac{1}{C_t} = \frac{\beta}{C_{t+1}}(1 + i_t)$$

- No arbitrage

$$1 + i_t = \frac{p_{k,t+1} + \alpha p_{t+1} Y_{t+1}}{p_{k,t}}$$

- National account identity

$$p_t Y_t = C_t + G_t$$

- Aggregate supply

$$(1 - \alpha) \frac{p_t Y_t}{L_t} = w_t \neq cL^\gamma$$

- Gov't budget constraint

$$B_{t+1} = B_t(1 + i_{t-1}) + G_t - T_t$$

- Equilibrium is pinned down by fixing a sequence $\{p_{k,s}\}_{s=t}^{\infty}$

The model

What determines asset prices?

- In a standard neoclassical model $\hat{E}[p_{k,t+1}] = f(\text{state variables})$
- Rational expectations imply $\hat{E}[p_{k,t+1}] = E[p_{k,t+1}]$.
- In this model because one equation is missing $\{p_{k,s}\}_{s=t}^{\infty}$ can be treated as an exogenous sequence of beliefs about future asset prices - state of expectations.
- Alternatively one can think about this as if there was a shock to the bargaining power of workers every period (Gali, Smets and Wouters (2010)).

The model

Steady state

- Steady state solution of the model in perfect foresight is

$$Z = \text{Const} = \frac{1 - \beta}{\alpha\beta} p_k$$

- Thus if $Z = C + G$ then 1\$ increase in government spending decreases consumption by 1\$ \rightarrow complete crowding out (Farmer (2010)).
- The question is whether the government can help economy in the short-run by boosting aggregate demand if a negative confidence shock hits the economy.
- We show that it cannot improve welfare, but can improve the unemployment situation.

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Effect on welfare

Proposition

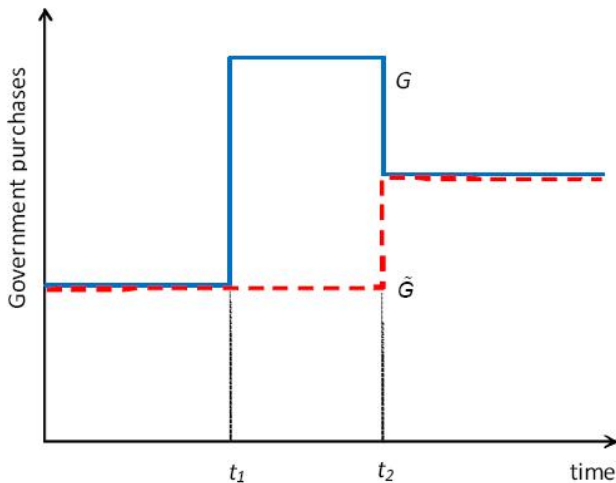
- Consider two economies with the same state of expectations $\{\rho_{k,s}\}_{s=t}^{\infty}$
- In the first economy fiscal policy is given by $\{G_s\}_{s=t}^{\infty}$. The resulting consumption sequence is $\{C_s\}_{s=t}^{\infty}$.
- In the second economy fiscal policy is given by $\{\tilde{G}_s\}_{s=t}^{\infty}$ so that $\tilde{G}_s \leq G_s \forall s$. The sequence of private consumption is $\{\tilde{C}_s\}_{s=t}^{\infty}$

Then

- $\tilde{C}_s > C_s \forall t < s < T$ where $T = \operatorname{argmax}_s \{G_s > \tilde{G}_s\}$. If $G_s > \tilde{G}_s$ for all $s > t$ then $\tilde{C}_s > C_s$ for all $s > t$

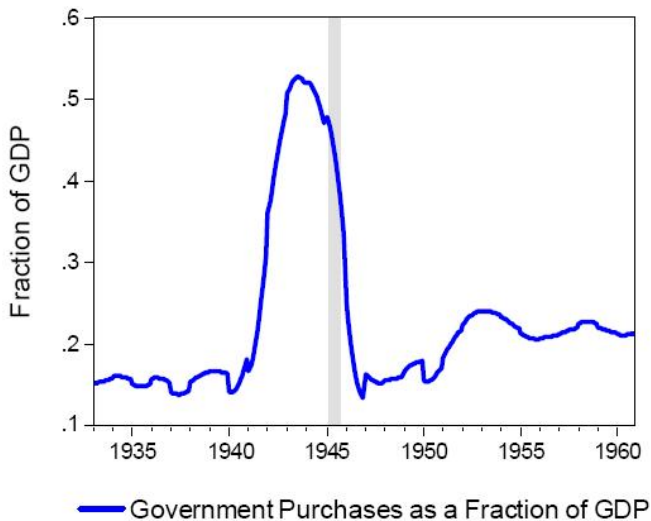
Effect on unemployment

Special case



Data

Wartime recovery



Effect on unemployment

Special case

Proposition

Same setup: two economies with the same state of expectations $\{p_{k,s}\}_{s=t}^{\infty}$ but with different expenditure sequences. Then

$$G_s = \begin{cases} \tilde{G}_s & \text{if } s < t_1 \\ \Delta \times \tilde{G}_s & \text{if } t_1 \leq s \leq t_2, \quad \Delta > 1 \\ \tilde{G}_s & \text{if } t_2 < s \end{cases}$$

Let $\{U_s \equiv 1 - L_s\}$ and $\{\tilde{U}_s \equiv 1 - \tilde{L}_s\}$ be the unemployment rates in each economy. Then $\exists T \geq 1$, where $t_2 \equiv t_1 + T$, such that

- 1 $U_s = \tilde{U}_s$ for $s > t_2$
- 2 $U_s > \tilde{U}_s$ for $s < t_1$
- 3 $U_s < \tilde{U}_s$ for $t_1 \leq s \leq t_2$ where $\Delta > 1$ is a constant.

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Application to data

Choice of the parameters

- We use historical annual data for S&P 500 index $s=1929..1947$ (Robert Shiller's website) and government expenditures(NIPA tables).
- Fix parameters of the model at $\alpha = 0.33$ (share of capital) and $\beta = 0.96$ (discount factor).
- Deflate S&P 500 index with nominal wage (follow Farmer(2010)). Since it is an index variable we can choose μ so that

$$p_{k,s} = \mu \cdot p_{S\&P500,s} \forall s$$

- We pick μ so that economy is in steady state in 1929.

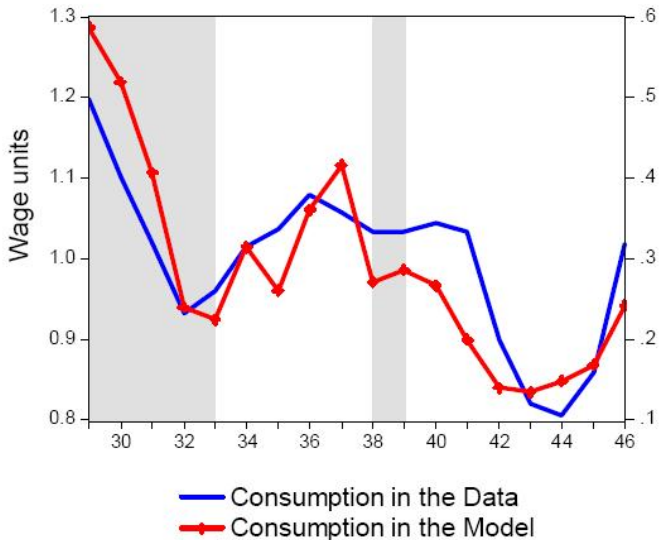
Application to data

Procedure

- As a terminal condition we assume that economy is in steady state in 1947. In other words, agents in the economy think that $p_{k,s} = p_{k,1947} \forall s \geq 1947$.
- Given the terminal condition we back up consumption sequence iterating Euler equation backwards starting from 1947 to 1929 using data on S&P 500 and government expenditures.
- At this point we also assume perfect foresight of the agents.

Data vs. Model

Consumption



Application to data

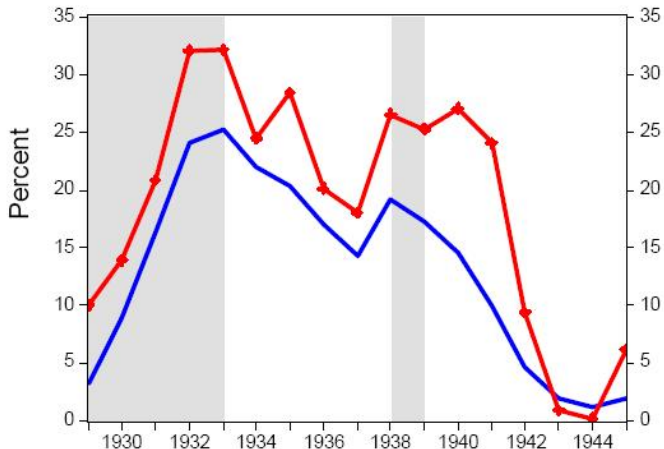
Unemployment

- Given backed out consumption and government expenditure sequences one can construct series for unemployment using aggregate supply equation

$$(1 - \alpha)(C_t + G_t) = (1 - U_t)$$

Data vs. Model

Unemployment



- Unemployment Rate in the Data
- ◆ Unemployment Rate in the Model

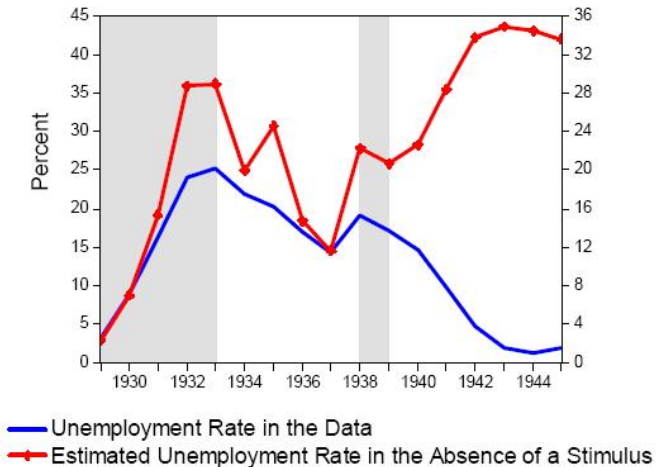
Application to data

An experiment

- What would have happened to the unemployment rate in the early 1940s if the government had not increased expenditures from 16% to 52% of the economy and if the stock market had followed the same path that we observed during this period?
- Procedure is the same as before, but the only difference is that we assume that the government spending stayed on its 1940 level for the period 1940-1947.

Data vs. Model

Unemployment in the experiment economy



Conclusion

- The paper studies the effect of an expansionary fiscal policy on output and employment in the economy old-Keynesian framework
- Such policy can reduce unemployment in the short-run at the expense of decreased consumption.
- If the stimulus is foreseen there will be an additional cost of reduced employment in the years leading up to the increase in government purchases.
- Given its simplicity the model does a good job fitting the data.

Conclusion

But it might not be the best idea to cure a recession

- Because the welfare cost could be significant purchased goods should be of significant social value
- If the stock market activity is not self-stabilizing as Keynes believed a large fiscal expenditure may not be the best way to restore full employment. It is critical to increase the value of confidence in the value of private wealth in order to permanently restore jobs.