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Okun's Law: Fit at 50?

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Comments on: Okun's Law: Fit at 50?; by Ball, Leigh and Loungani

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Motivation

- This paper studies the stability of Okun's Law, that is, the relationship between movements in the unemployment rate and movements in the output gap (defined as deviations of output from trend). The basic equations is written as

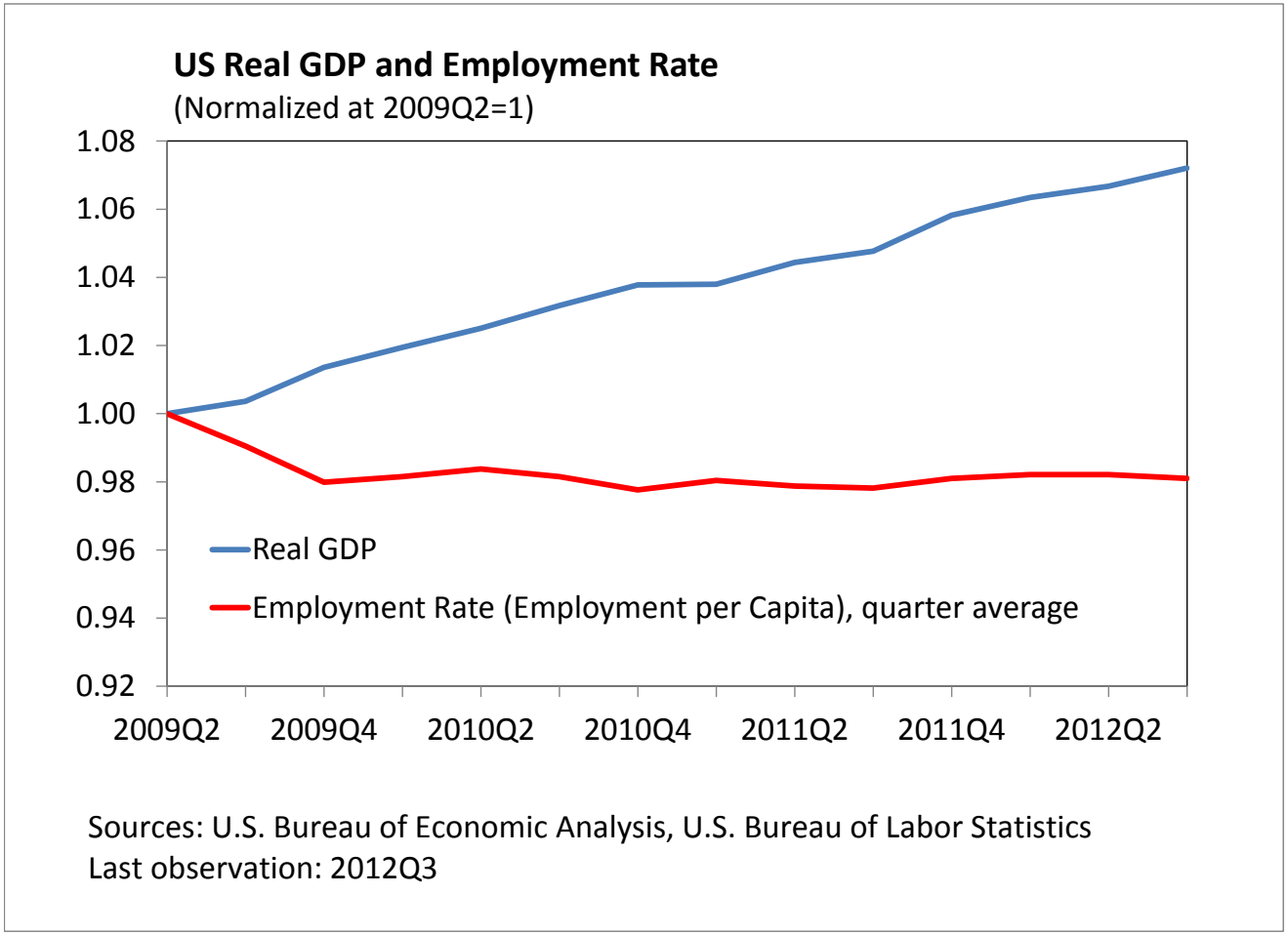
$$U_t = U_t^* + \beta(Y_t - Y_t^*) + \epsilon_t$$

- The main claim of the paper, is that such a relationship is very stable for the US and most OECD economies. This holds whether the relationship is estimated using the employment rate or the unemployment rate, whether it is estimated in first differences, or using a smooth trend to get the output gap. For the US, the coefficient is around -0.4 (0.5 for the employment rate).
- The empirical work is convincing, so I have no major issue with the empirical finding

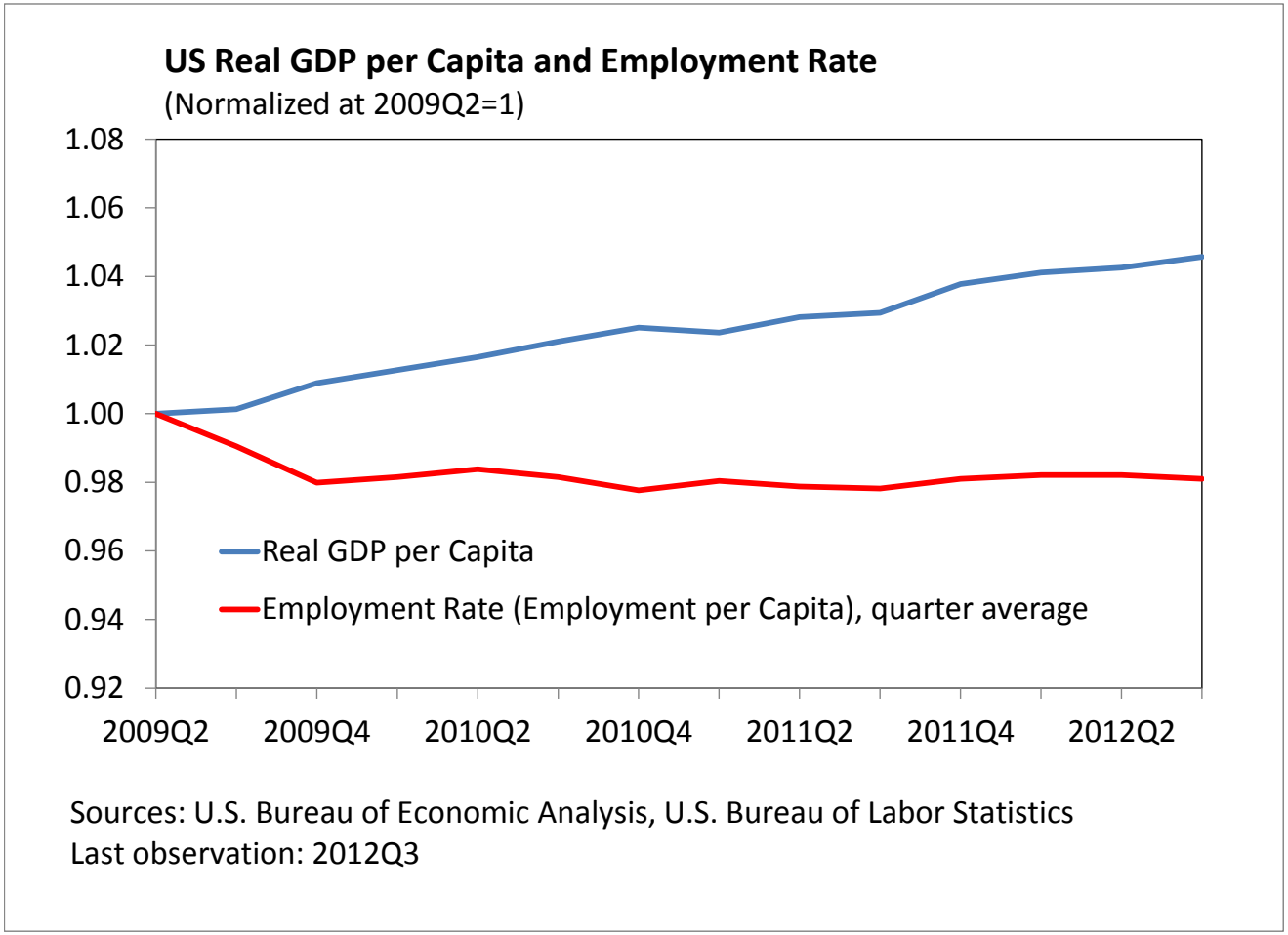
Questions

1. Why do we care (given it is a relationship between two endogenous variables)?
2. What do we learn by its stability?

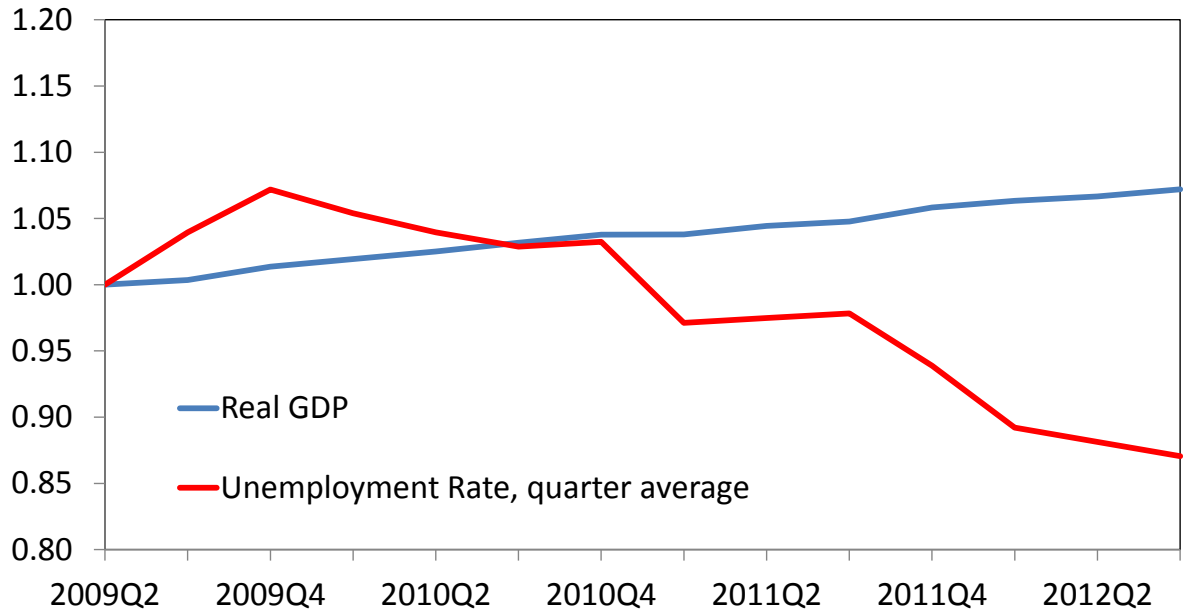
- The first is easily seen from simple data plots: Output growth since the great recession seems decoupled from employment (job less recoveries)



Sources: U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics
Last observation: 2012Q3


US Real GDP per Capita and Employment Rate
(Normalized at 2009Q2=1)
1.08
1.06
1.04
1.02
1.00
0.98
0.96
0.94
0.92
2009Q2
2009Q4
2010Q2
2010Q4
2011Q2
2011Q4
2012Q2
Real GDP per Capita
Employment Rate (Employment per Capita), quarter average
Sources: U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics
Last observation: 2012Q3

US Real GDP and Unemployment Rate
(Normalized at 2009Q2=1)



Sources: U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics
Last observation: 2012Q3

- How is this explained by the authors?
- Output since late 2009 has been growing about at trend, so according to Okun's Law, the unemployment rate should not be moving.

$$\Delta \frac{E}{L} = \Delta U_t = \beta(\Delta Y_t - \Delta Y_t^*) = \beta(0) = 0$$

- So these figures should be no surprise – and entirely consistent with Okun' Law – given the slow growth of output.
- What do we learn?

What do we learn?

- Here paper is not too clear. Main statement:
  "The data are consistent with traditional models in which fluctuations in employment are caused by shifts in aggregate demand"
- What does this mean? Which traditional models? What would it take to be inconsistent?
- My reading suggests that neither a too simplistic demand driven view nor a pure supply driven is consistent with the observed stable Okun relation.

What do we learn?

- I will focus on the employment rate specification of the Okun relation.
- First, let me note the difference between running the regression on the employment rate (HP detrened)on the output gap (HP detrended) versus running the output gap on employment rate.
- In Okun formulation, the paper reports a coefficient close to .5.
- When I run the reverse regression, I get a coefficient very close to 1. (results similar in first differences)
- How to interpret?

- The way I believe we can best understand this pattern, is through a simple combination of an aggregate production function and certain correlations.

$$\ln Y_t = \alpha \ln \frac{E_t}{L_t} + \alpha \ln L_t + \beta \ln K_t + \ln TFP_t$$

- In the short run, IV estimates of α tends to be close to 1, and β close to zero, so I can simplify write

$$\Delta \ln Y_t = \Delta \ln \frac{E_t}{L_t} + \Delta \ln L_t + \Delta \ln TFP_t$$

- Interestingly, just running $\Delta \ln Y_t$ on $\Delta \ln \frac{E_t}{L_t}$ by OLS I also get about 1.
- This implies that changes in the employment rate are approx. uncorrelated with changes in pop growth or changes in TFP (and confirmed in the data using Fernald's measure of TFP).
- Note 1: Pattern not very supportive or RBC view of fluctuations

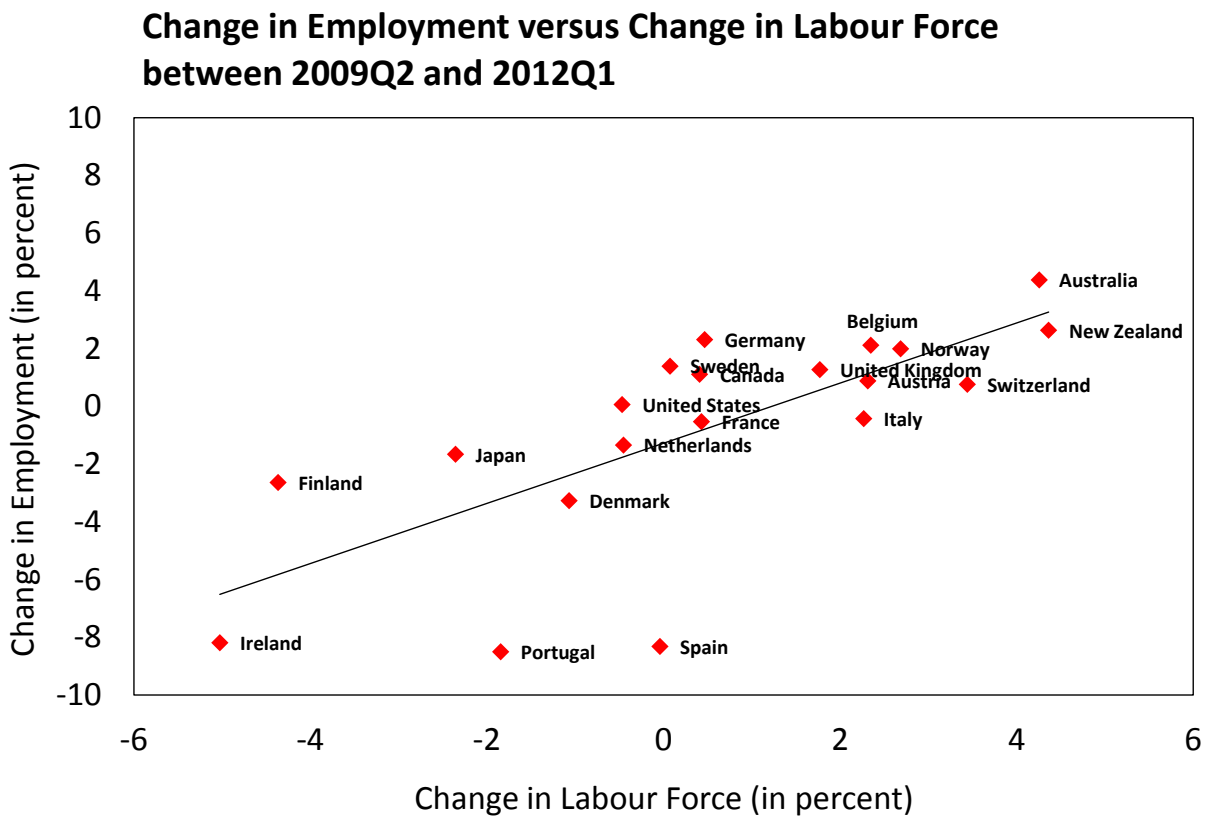
- Now take production function and rewriting in Okun form

$$\Delta \ln \frac{E_t}{L_t} = \frac{1}{\alpha} \Delta \ln Y_t - \alpha \Delta \ln L_t - \Delta \ln TFP_t$$

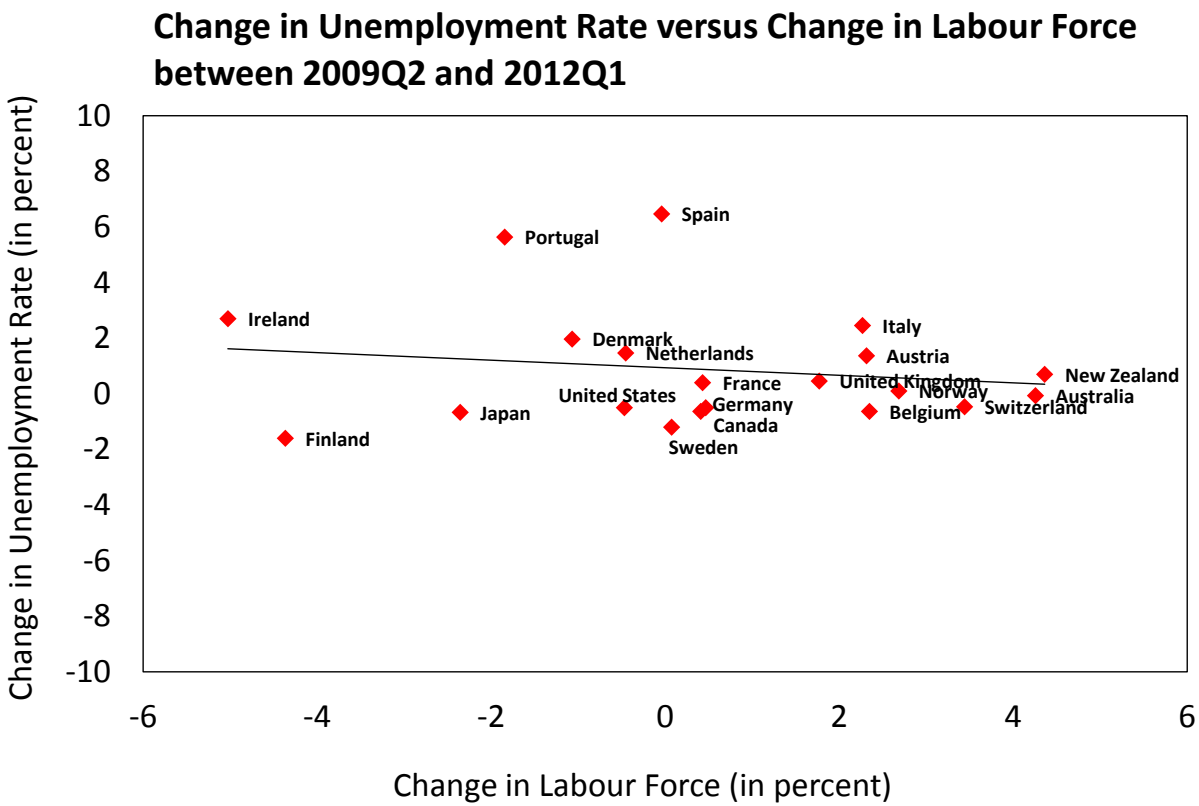
- A regression of $\Delta \ln \frac{E_t}{L_t}$ on $\Delta \ln Y_t$, will be stable and have a coefficient well below 1 if (a) the production function is stable with α close to 1 and (b) the correlations between output, TFP growth and pop. growth are stable and strongly positive
- The key element here being the implied strong positive correlation between output, pop growth and TFP growth even in the short run.
- This is precisely the implication that the employment rate is not negatively correlated with these factors.
- The Okun coefficients is not representing a causal effect of "demand" on employment.

What do we learn?

- The Okun coefficient of .5 implies that output is strongly affected by supply factor – such as pop growth and TFP growth – even in the short run and this remains true over time.
- In other words, what we learn from the stability of the Okun relation is that, even more recently, pop growth and TFP create there own demand, or alternatively do not create unemployment.
- This runs counter to the extreme view that output demand is essentially given in the short run, independent of supply factors and it is this exogenous output demand that controls employment.



Source: IMF *International Financial Statistics* database



Source: IMF *International Financial Statistics* database

What do we learn?

- Given that the estimated Okun relationship for the US is indication that output reacts strongly to some supply factors, does it imply that the paper is essential support for a supply side view of employment determination ?
- NO, but evidence requires one at minimum to adopt a more nuanced "demand view" whereby demand factors determine employment rates and not the level of output.
- I would say that traditional demand theories do not make this distinction, but modern theories often do.

What do we learn?

- For example, depending one how one specifies monetary policy, the New Keynesien model can be such a theory. If monetary policy is view as specifying deviations of real rates from the flex-price levels (maybe due to zero lower bound issues), then it becomes a theory of the employment rate.

$$(\ln \frac{E}{L} - (\ln \frac{E}{L})^*) = -\gamma \sum_{i=1}^{\infty} \psi^i (r_{t+i} - r^*_{t_i})$$

- However, in such a case, unemployment will not be helped by restricting labor force growth or becoming any-technology.

Summary of my take-away

- Contrary to potential first impressions, the observed stability of the Okun relation should not be taken as support for an "OUTPUT demand constraint" view of employment determination, and should not be interpreted as causal.
- Instead it lends supports to models of employment rate determination where output is a more passive player; which could be of a more supply driven or a modern demand driven type.
- The distinction between the two different demand view is important given different implications for unemployment of policies aimed at reducing labor force growth or technological advancement.
- For explaining the different Okun coefficients across countries, I would suggest looking at the role of the different variances of TFP and pop. growth and their correlations.