

Capacity utilization as an alternative output gap measure: Evidence from Peru

Central Bank of Peru

Outline

- 1 Motivation
- 2 Capacity utilization as an output gap measure
- 3 Methodology
- 4 Results
- 5 Conclusions

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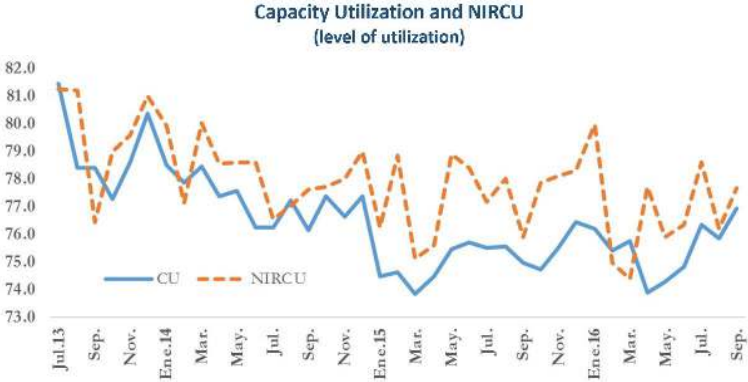
Standard statistical methods:

- Impose strong priors on the smoothness of the trend or cycle. -Restrictions lack support in theory.

- Output tend to be heavily revised and real-time estimates are often flawed.

As a result, this is especially problematic as the end-point estimates are most important for central banks to make forward-looking monetary policy decisions.

Orphanides and Williams (2005) shows that the existence of significant misjudgments in the natural rate alter inflation expectations and thereby contributed to a poor macroeconomic performance.



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Staiger et al. (1997) show that “some other variables are at least as valuable as unemployment for predicting inflation”

Stock and Watson (1999) suggest that inflation forecasting can be improved by adding measures of aggregate economic activity. Using monthly data found that predictive ability is greater, for example, using housing construction, capacity utilization or the growth rate of the manufacturing.

McElhattan (1985) gives particular attention to the use of capacity utilization and the estimate of the natural rate. NAIRCU defined as (non-accelerating inflation rate of capacity utilization) refers to the rate of capacity utilization consistent with a stable inflation rate.

Köberl and Lein (2011) use firm-level quarterly data to estimate the NIRCU (non-inflationary rate of capacity utilization) and thus find the gap in capacity utilization to be incorporated into the equation adaptation of the Phillips curve.

Sahinöz and Atabek (2016) finds evidence that capacity utilization gap has a significant positive effect on inflation and allows to assess the economic cycle and inflationary pressures.

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A bottom-up approach using the Macroeconomic and Entrepreneurial Climate Expectations conducted by the Central Reserve Bank.

Define the capacity utilization rate not biased and consistent with no price adjustments

$$NIRCU_{it}(Utilization_{it} | \Delta Price_{it} = 0, E_t(\Delta Price_{i,t+1}) = 0, Investment\ gap = 0)$$

Construct a firm-specific NIRCU and then aggregate to obtain a macro level NIRCU

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$$CU_t = \sum_i \frac{\text{Top 10000 position} * Utilization_{it}}{\text{Maxweight}CU_t}$$

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$$NIRCU_t = \sum_i \frac{\text{Top 10000 position} * NIRCU_{it}}{\text{Maxweight}NIRCU_t}$$

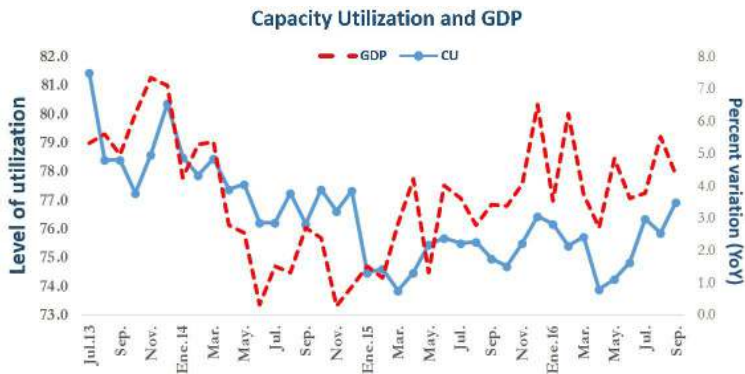
$$\text{Maxweight}NIRCU_t = \sum_i \text{Top 10000 position} * NR_{it}$$

$$GapCU_t = CU_t - NIRCU_t$$

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Capacity Utilization indicator seems to follow GDP dynamic



Capacity Utilization Gap shows more variation than other filters.

$$\pi_t = \alpha + \beta\pi_{t-1} + \gamma\pi_t^e + \sum_{i=0} \delta_i \Delta ex_{t-i} + \sum_{j=0} \theta_j Gap_{t-6} + \varepsilon_t$$

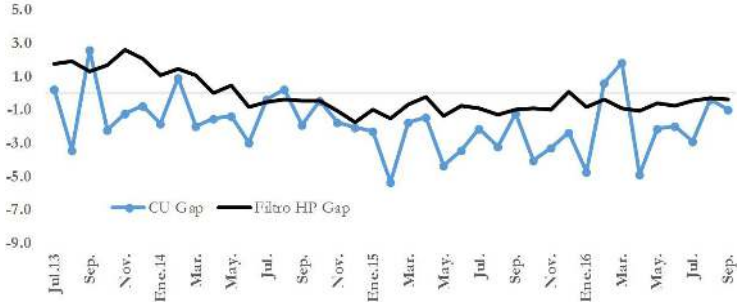
	IIP Gap	CU Gap
α	0.27	0.18
π_{t-1}	0.50**	0.51**
π_t^e	0.68**	0.47**
Δex_t	0.08**	0.06**
Gap_{t-1}	0.13**	-
Gap_{t-6}	-	0.05*
R²	0.86	0.90
R² Ajust.	0.84	0.88

* Significativo al 10%

** Significativo al 5%

In nearly 90 percent of the periods, constructed indicator followed the same direction that HP Filter

Capacity Utilization Gap and Hodrick-Prescott Filter



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- **Capacity utilization gap provides information on the direction of the economy with 45 days in advance compared to alternative measure, being an alternative high-frequency output gap measure.**
- **Since there are data restrictions, further analysis will enable a test for forecasting Inflation.**

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