



Policy Brief

September 2015
PB-15/22

Does Growth Create Jobs in the G-20 Economies?

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Summary

There is a striking variation among the G-20 countries in the extent to which employment and unemployment respond to growth over the course of a year. In some countries (for example, Australia, Korea and South Africa), labor markets are quite responsive to overall economic conditions: when growth picks up, so does employment, and unemployment falls. In other countries (for example, Brazil, China, Turkey) the response is quite muted: measured employment and unemployment barely budge when growth picks up or slows down. These differences among countries have not changed much since the Great Recession. Thus, a pick-up in growth will result in more jobs, but the extent of job creation in the short run could vary significantly across countries.

Unemployment remains a global concern: if they formed their own country, the unemployed would constitute the fifth most populous country in the world ([Lagarde 2014](#) and [International Jobs Report](#)). Reducing unemployment was endorsed as a policy priority at the [G-20 Leaders Summit](#) last November. But what concretely can be done to create jobs and lower unemployment?

One open issue is whether a pick-up in economic growth leads to job creation in the short run (say, over the course of a year). This brief provides evidence on this issue by studying the historical link between jobs and growth. The main finding is that growth leads to jobs but the strength of the link varies considerably across countries.

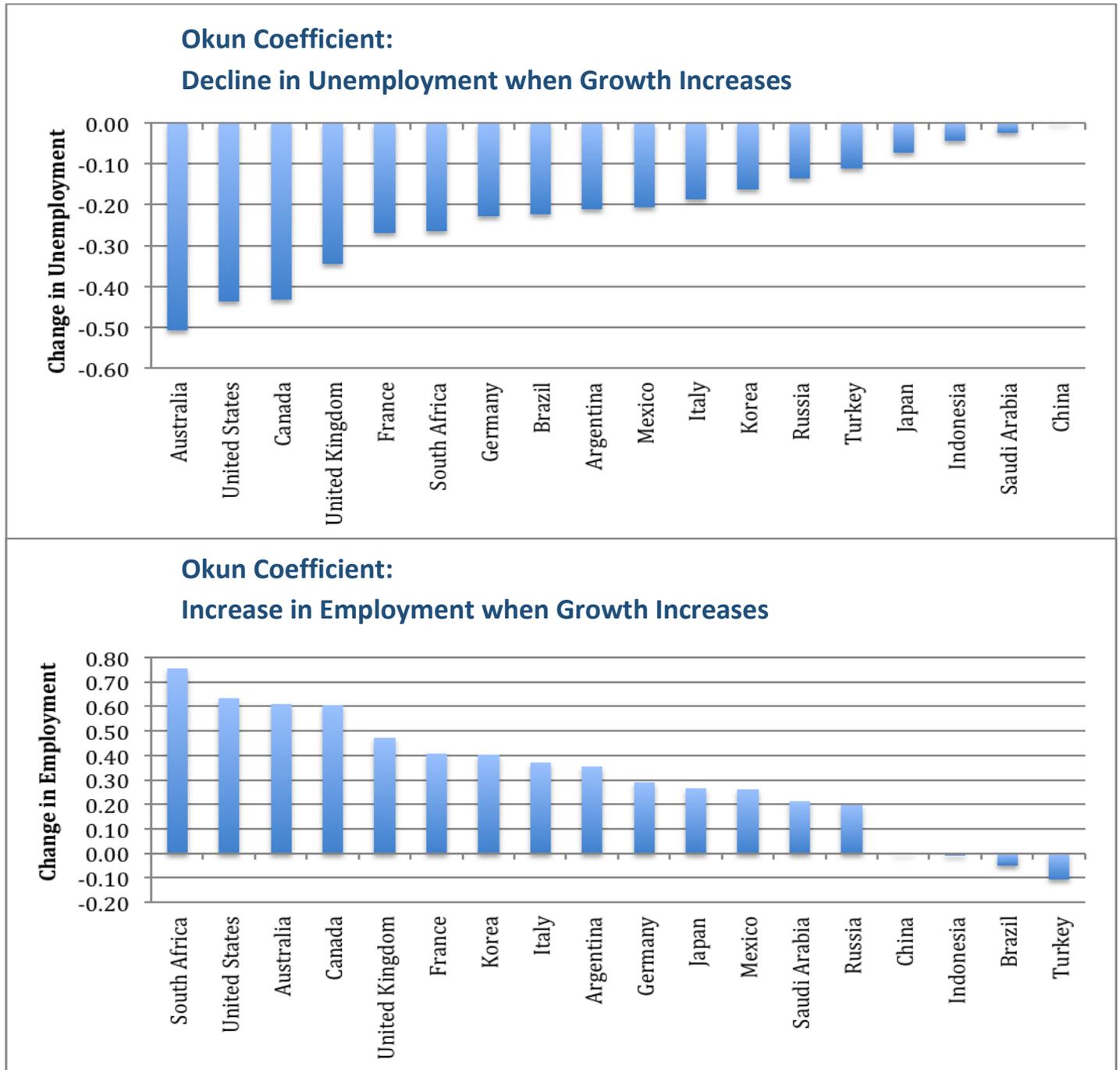
The evidence that extra growth will bring back jobs in many countries leads to the obvious question: what will deliver the extra growth? In Furceri and Loungani (2014), we advocate a two-handed approach: continued support to domestic aggregate demand and the adoption of policies and reforms that can boost aggregate supply. Without supportive demand policies, supply measures could have little impact in the short run. If companies do not see improved sales prospects, they will not increase capacity; hence, it is essential to ensure that the demand is there to sustain supply. But without supply measures, output gains based solely on a stimulus to demand will prove temporary. For G-20 policymakers, the message is that, while not a panacea, growth is an essential part of the cure for unemployment.

* The paper draws on Ball, Furceri, Leigh and Loungani (2015) and Ball, Leigh and Loungani (2013). We thank Zidong An for outstanding research assistance.

Evidence on the Jobs-Growth Link

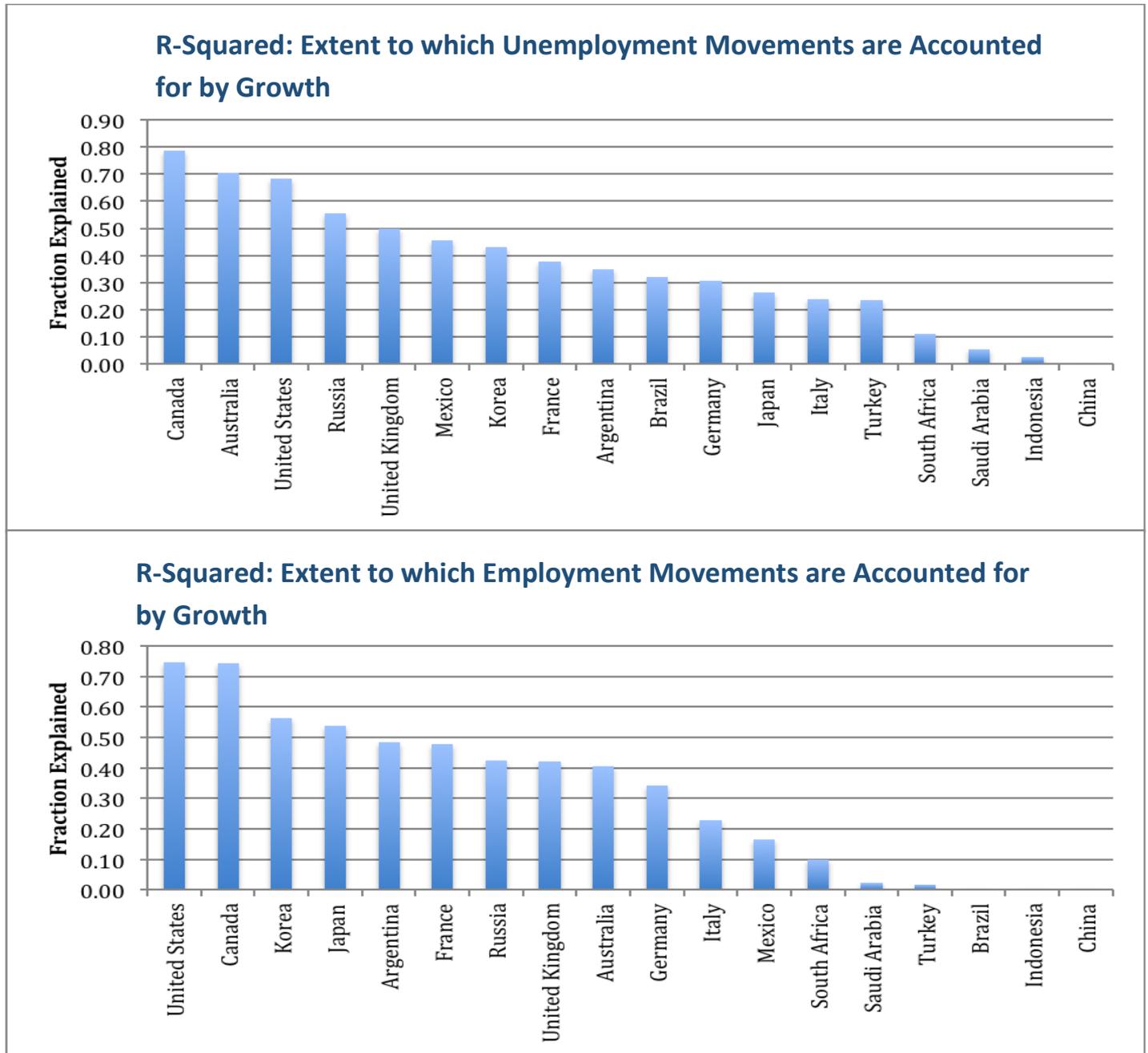
Consider the top panel of Figure 1 which shows the extent to which unemployment falls in different countries when growth picks up. In Australia, an additional percentage point of growth lowers the unemployment rate by half a percentage point; in China there is no effect.

Figure 1: The Jobs-Growth Link in G20 Countries



The bottom panel of Figure 1 shows how much employment increases when growth picks up. In South Africa, a 1% increase in growth is matched by a 0.75% increase in employment. In contrast, there is virtually no response of employment to growth in Brazil, China, Indonesia and Turkey.

Figure 2: How Important is Growth for Jobs?



Notes to Figures 1 and 2: Bars show coefficients from regressions of the change in unemployment on real GDP growth (top panel) and employment growth on real GDP growth (bottom panel) over 1980 to 2014. Higher bars indicate greater responsiveness to growth

Figure 2 shows the extent to which changes in growth account for changes in unemployment and employment. In the top panel, we see that nearly 80 percent of the variation in Canada’s unemployment rate can be accounted for by short-run fluctuations in growth; in Mexico this figure is about 40 percent, in Turkey 20 percent, and in China it is zero. In the bottom panel, we see that growth accounts for over 70 percent of the variation in employment in Canada and the United States, about 40 percent in Russia, the United Kingdom and Australia, and very little in many other countries.

Summarizing the evidence on the jobs-growth link

In short, there are large variations across countries in the jobs-growth link—known in economic jargon as the ‘Okun coefficient’ (see the Annex)—and in the extent to which growth accounts for labor market movements—the ‘R-square statistic’ in the jargon. Can this evidence be summarized in some way?

Figure 3: The Jobs-Growth Link—Summarizing the Evidence

		Change in Unemployment	
		Okun-Coefficient (abs) < Average	Okun-Coefficient (abs) >= Average
R-Sq < Average		Argentina, <i>China, Indonesia, Italy, Japan, Saudi Arabia, Turkey</i>	Brazil, Germany, <i>South Africa</i>
R-Sq >= Average		Korea, Mexico, <i>Russia</i>	<i>Australia, Canada, France, United Kingdom, United States</i>

		Change in Employment	
		Okun-Coefficient < Average	Okun-Coefficient >= Average
R-Sq < Average		Brazil, <i>China, Indonesia, Mexico, Saudi Arabia, Turkey</i>	Italy, <i>South Africa</i>
R-Sq >= Average		Germany, Japan, <i>Russia</i>	<i>Argentina, Australia, Canada, France, Korea, United Kingdom, United States</i>

Figure 3 tries to do so by combining the information on the Okun coefficient and the R-square statistic to classify countries into four quadrants.

Consider the top panel of Figure 3. For the countries listed in the southeast quadrant (Australia and several others), the unemployment-growth link is strong: unemployment is fairly responsive to growth and fluctuations in growth account for a large chunk of fluctuations in unemployment. For the countries listed in the northwest quadrant (Argentina and several others), one could say that the unemployment-growth link is weak: unemployment does not respond to growth and fluctuations in growth do not account for much of unemployment fluctuations.

What about the two remaining quadrants? In countries in the northeast quadrant—Brazil, Germany and South Africa—the unemployment rate is responsive to growth but variations in growth do not appear to be the predominant drivers of unemployment fluctuations. In countries in the southeast quadrant—Korea, Mexico, Russia—the unemployment rate is not very responsive to growth but factors other than growth do not appear to be driving unemployment fluctuations.

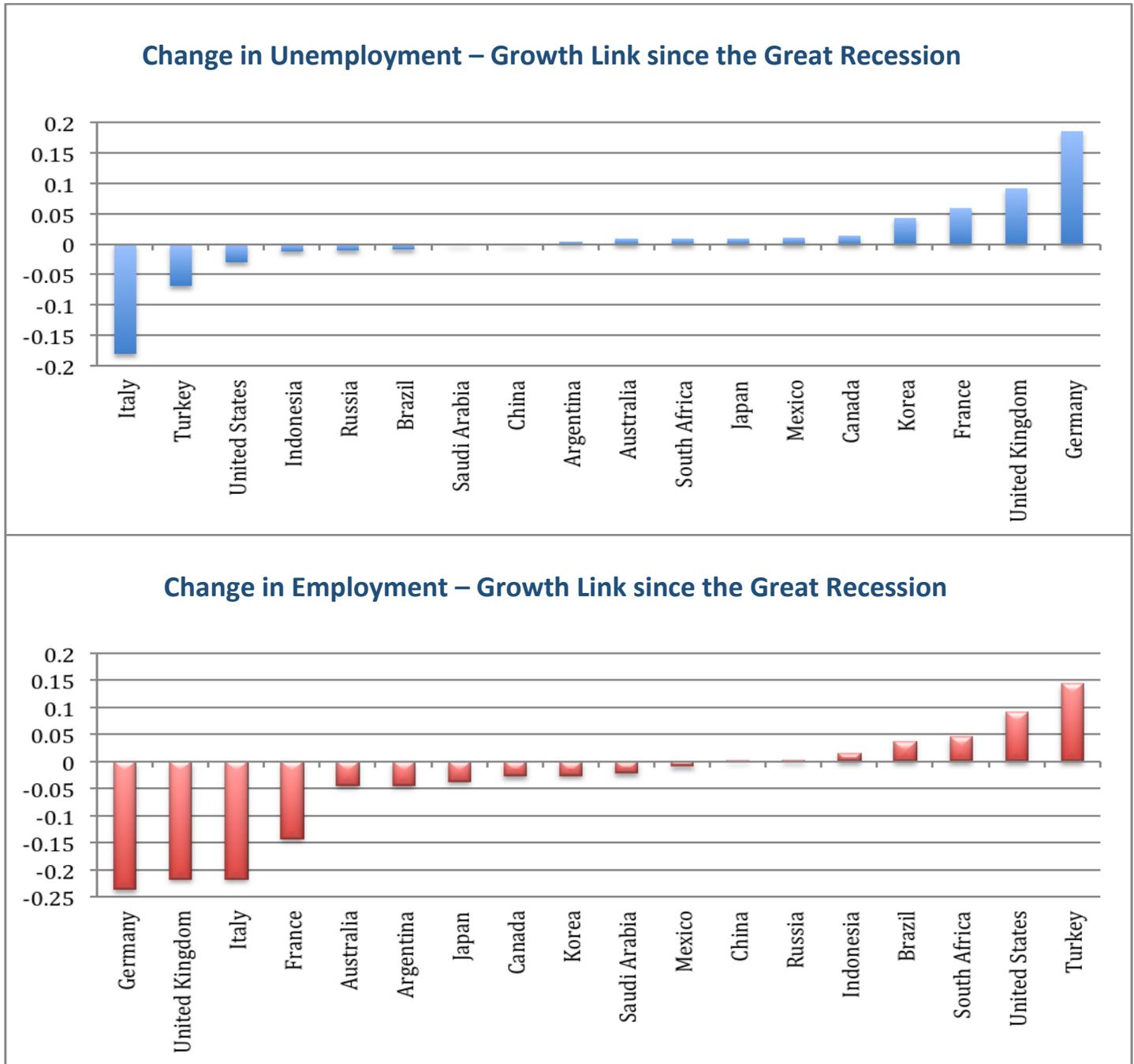
A similar analysis can be conducted for the bottom panel of Figure 3, which summarizes the evidence on the link between employment and growth. (Countries shown in *italics* in Figure 3 appear in the same quadrant for both unemployment and employment cases.)

Changes during the Great Recession

We next compare the strength of the jobs-growth link (i.e. the Okun coefficient) over the time period 1980 to 2007 with that over the time period 1980 to 2014. Does including the period of the Great Recession alter our view of the historical relationship?

We draw two main conclusions from the evidence shown in Figure 4. First, for most countries, the link has not changed much. In particular, the large cross-country variations remain intact. Second, there is no easy story (that at least we can tell) for why the relationship got a bit stronger in some countries and a bit weaker in others.

Figure 4: Change in Jobs-Growth Link in Recent Years



Notes to Figure 4: The bars represent the difference in the Okun coefficient between regressions estimated for the 1980 to 2014 period and the 1980 to 2007 period.

Conclusion

In the short run, unemployment depends in large part on what happens to growth. Triggering growth requires both demand measures—traditionally thought of as the domain on Finance Ministers and supply measures—more under the purview of Labor and Employment Ministers. It is good when the two ministries unite in the cause of lowering unemployment.

Annex: The Jobs-Growth Link (Okun's Law)

Okun's Law is an inverse relationship between cyclical fluctuations in output and the unemployment rate. It is assumed that shocks to the economy lead output to fluctuate around potential; this in turn causes firms to hire and fire workers, changing the unemployment rate in the opposite direction. This relation can be expressed as:

$$u_t^c = \beta y_t^c + \varepsilon_t \quad (1)$$

Where u_t^c and y_t^c are the cyclical components of the unemployment rate and log output, respectively. We compute u_t^c and y_t^c as the deviation of the unemployment rate (u) and log output (y) from their respective trends, which are constructed using the Hodrick-Prescott (HP) filter. We consider two values of the smoothness parameter in the HP filter, 100 and 12.

Another version of Okun's Law posits a relationship between the changes in the unemployment rate and the growth rate of output:

$$\Delta u_t = \alpha + \beta \Delta y_t + \varepsilon_t \quad (2)$$

We refer to equation (1) as the 'gap' version and equation (2) as the 'changes' version of Okun's Law. We also estimate variants of these two equations with employment as the dependent variable; that is, in the 'gap' version the dependent variable is the cyclical component of employment and in the 'changes' version it is the growth rate of employment. In total, this gives us six variants of Okun's Law.

Table A1 provides estimates of the Okun coefficient for G20 countries for the various version of Okun's Law that we estimate. Table A2 shows that there are high correlations among the Okun coefficients from the six variants of Okun's Law that we estimate.

Given the stability in Okun's Law, a fair amount of the employment behavior in G20 countries since the Great Recession could have been predicted by the historical relationship between jobs and growth. This is shown in the top panel of Figure A1, which is a plot of the average annual employment growth over 2008-13 against what could have been predicted based on Okun's Law estimated for the period 1980-2007. Given the cross-country heterogeneity in Okun's coefficients that was shown earlier, it is important to use each country's specific Okun coefficient. If this is not done, a plot of employment growth versus output growth—as shown in the bottom panel of Figure A1—can show little relationship and point incorrectly to a breakdown of Okun's Law.

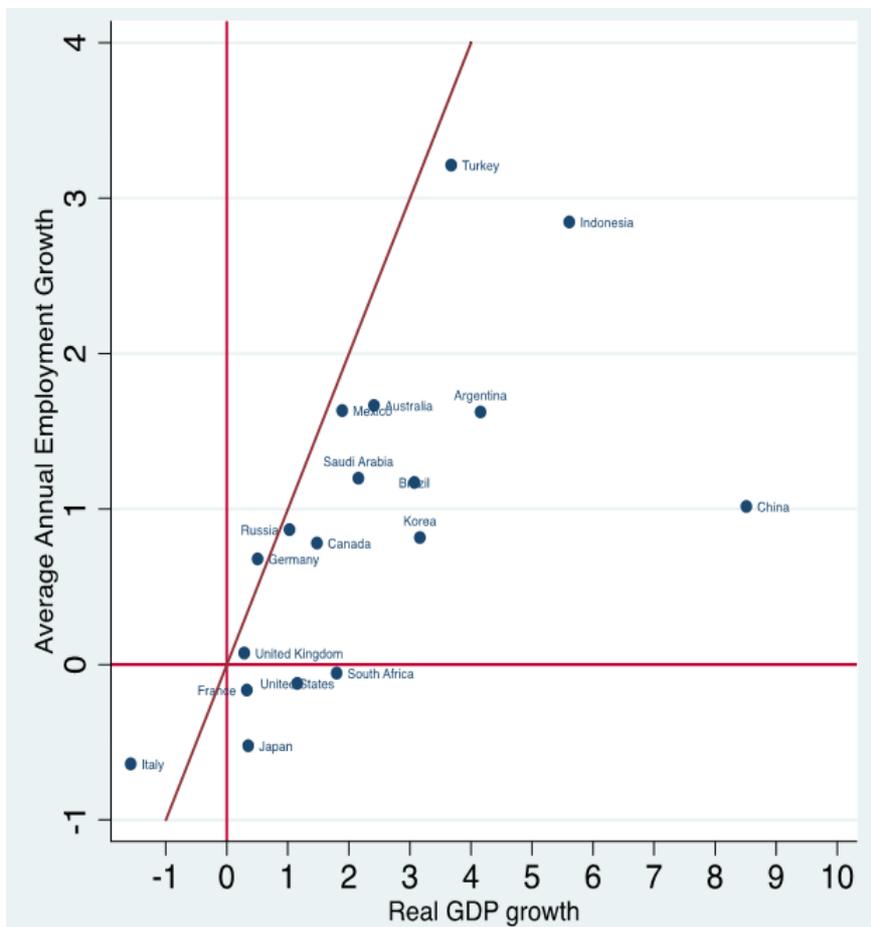
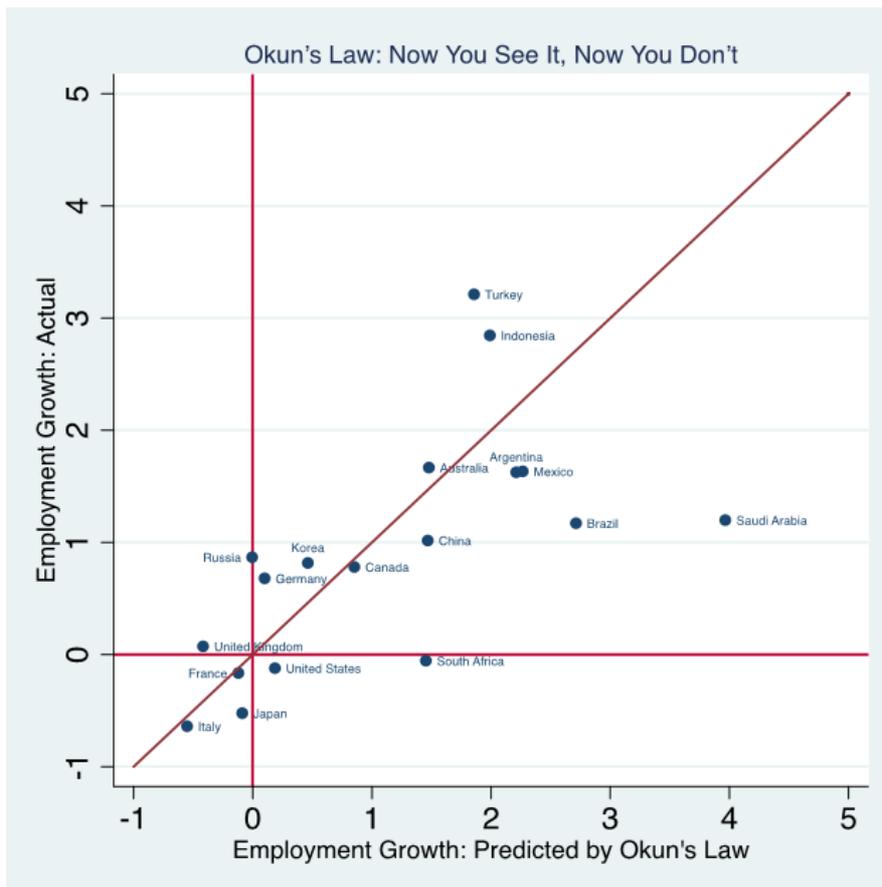
Table A1: Estimates of Okun's Law for G-20 Countries

Country	Unemployment Gap (lambda=100)	Unemployment Gap (lambda=12)	Change in Unemployment	Employment Gap (lambda=100)	Employment Gap (lambda=12)	Change in Employment
Argentina	-0.107 *	-0.228 ***	-0.212 ***	0.268 ***	0.421 ***	0.353 ***
Australia	-0.565 ***	-0.546 ***	-0.507 ***	0.835 ***	0.786 ***	0.610 ***
Brazil	-0.221 ***	-0.198 ***	-0.223 ***	-0.155	-0.014	-0.050
Canada	-0.448 ***	-0.491 ***	-0.431 ***	0.662 ***	0.622 ***	0.606 ***
China	-0.014	0.005	-0.003	-0.053	-0.034	0.000
France	-0.350 ***	-0.312 ***	-0.270 ***	0.601 ***	0.508 ***	0.409 ***
Germany	-0.374 ***	-0.299 ***	-0.229 ***	0.488 ***	0.374 ***	0.289 ***
Indonesia	-0.008	0.028	-0.043	-0.039	-0.034	-0.008
Italy	-0.261 ***	-0.151 **	-0.186 ***	0.818 ***	0.488 ***	0.370 ***
Japan	-0.170 ***	-0.151 ***	-0.073 ***	0.232 ***	0.203 ***	0.266 ***
Korea	-0.314 ***	-0.301 ***	-0.163 ***	0.594 ***	0.504 ***	0.403 ***
Mexico	-0.186 ***	-0.202 ***	-0.207 ***	0.401 ***	0.319 ***	0.262 **
Russia	-0.146 ***	-0.144 ***	-0.136 ***	0.175 ***	0.161 **	0.197 ***
Saudi Arabia	0.000	0.004	-0.025	0.329 *	0.503	0.214
South Africa	-0.349 ***	-0.372 ***	-0.265 *	0.908 ***	0.946 **	0.755 *
Turkey	-0.095 **	-0.133 ***	-0.113 ***	-0.187	-0.071	-0.107
United Kingdom	-0.395 ***	-0.406 ***	-0.345 ***	0.648 ***	0.579 ***	0.472 ***
United States	-0.519 ***	-0.553 ***	-0.437 ***	0.706 ***	0.706 ***	0.636 ***

Table A2: Correlation among Okun Coefficients

	Unemployment Gap ($\lambda=100$)	Unemployment Gap ($\lambda=12$)	Change in Unemployment	Employment Gap ($\lambda=100$)	Employment Gap ($\lambda=12$)	Change in employment
Unemployment Gap ($\lambda=100$)	1.00					
Unemployment Gap ($\lambda=12$)	0.96	1.00				
Change in Unemployment	0.93	0.96	1.00			
Employment Gap ($\lambda=100$)	-0.77	-0.72	-0.68	1.00		
Employment Gap ($\lambda=12$)	-0.74	-0.75	-0.70	0.94	1.00	
Change in employment	-0.79	-0.82	-0.75	0.94	0.96	1.00

Figure A1



References

Ball, Laurence, Daniel Leigh and Prakash Loungani, 2013, "[Okun's Law: Fit at 50?](#)," NBER Working Paper No.

Ball, Laurence, Davide Furceri, Daniel Leigh and Prakash Loungani, 2015, "Does One Law Fit All? Cross-Country Evidence on Okun's Law," IMF Working Paper, forthcoming. ([Presentation](#) available)

Furceri, Davide and Prakash Loungani, 2014, "[Growth: An Essential Part of the Cure for Unemployment](#)," imfdirect, November 19, 2014

About the authors

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Prakash Loungani is Advisor in the IMF's Research Department and Co-Chair of the IMF's group on Jobs and Growth, and a Senior Fellow at OCP Policy Center. He is also an adjunct Professor of Management at Vanderbilt University's Owen School of Business, where he has taught in the Executive MBA program for the past 15 years. During 2013-14, he was on the World Economic Forum's council on employment issues. His academic work has been published in top-tier journals and the citations to this work place him among the top 5% of economists worldwide.

He was the co-author of the IMF's background paper for the ILO-IMF conference in Oslo on tackling unemployment. More recently, he is the co-author (with Olivier Blanchard and Florence Jaumotte) of a paper on 'Labor Market Policies and IMF Advice in Advanced Economies during the Great Recession' and has ongoing work on labor migration.

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