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Is there a Trade-off between Output and Unemployment? An Evidence from Okun's Law for G-20 Countries

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Çıktı ve İşsizlik Arasında bir Denge Var mıdır? G-20 Ülkeleri İçin Okun Yasası'ndan bir Kanıt

Öz

Literatürde Okun Yasası olarak bilinen şekliyle çıktı ile işsizlik arasında G-20 ülkeleri için bir denge var olabilir. Bu araştırmanın amacı, G-20 ülkeleri için 1991-2014 dönemini kapsayan zaman serisi verileri ile Okun Yasasını yeniden gözden geçirmektir. İlişkiyi test etmek için birinci dereceden fark ve "boşluk" belirtme metotları kullanılmaktadır. Boşluk belirtme metodu için Hodrick-Prescott (HP), Chiristiano-Fitzgerald (CF) and Butterworth (BW) filtreleme teknikleri yürütülmektedir. Tüm metotlar için, bulgular ülkelerin çoğunda çıktı ile işsizlik arasında ters bir ilişkinin varlığını doğrulamaktadır. İlginç bir bulgu ise Çin, Endonezya, Sudi Arabistan ve Türkiye'de kullanılan bu filtreleme tekniklerinin en az bir tanesiyle Okun katsayısı sağlanamamaktadır. Anlaşılmaktadır ki, G-20 ülkeleri gelişme karakteristikleri ve üretim farklılıklarına dayanarak farklı Okun katsayıları sergilemektedirler.

Anahtar Kelimeler: Okun Yasası, İşsizlik, Çıktı, G-20 Ülkeleri

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Abstract

There can be a trade-off between output and unemployment which is formally called in literature as Okun's Law for G-20 countries. The objective of this research is to reconsider Okun's Law for G-20 countries with time-series data over the period 1991-2014. First order difference and "gap" specification methods are used for testing the relationship. Three different filtering techniques; Hodrick-Prescott (HP), Chiristiano-Fitzgerald (CF) and Butterworth (BW) are conducted for the gap specification method. For all methods, the results validate the existence of inverse relation between output and unemployment in most of the countries. An interesting finding is China, Indonesia, Saudi Arabia and, Turkey do not satisfy the Okun's coefficient with at least one of these filtering techniques. It is understood that, Group of G-20 countries display different Okun's coefficients depending on their development structures and productivity heterogeneities.

Keywords: : Okun's Law, Unemployment, Output, G20 Countries

1. Introduction

Global economic system, encourage countries to work within collaboration. Developing countries aims to reach developed countries' level economically by the help of this cooperation. Although this purpose is not articulated directly, living in better welfare conditions is the prior economic target of every nation. The Group of Twenty (also known as G-20) in real includes 19 unique countries, which is an international corporation for the governments and central bank governors from 20 major emerging economies along with European Union. The G-20 economies produce around 86% of the world Gross Domestic Product (GDP) and contains 67% of world population (IEA, 2012). G-20 countries which are the extended form of G7 countries are Canada, France, Germany, Italy, Japan, United Kingdom, United States (as called G7 countries) and Argentina, Australia, Brazil, China, Indonesia, India, Korea Republic, Mexico, Russia Federation, Saudi Arabia, South Africa and Turkey (as called G-20 countries). While the mean of GDP per capita for G7 countries is around 34636.17 US dollars with standard deviation of 4549.013, this mean is around 8432.142 US dollars with standard deviation of 8646.037 for the G-20 countries except for G7. In addition to this, the average value of GDP per capita for all of them (G-20 as a whole) is around 18086.26 US dollars with standard deviation of 14658.57 (for detailed

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information please look at Table 1 in Appendix). The differences between GDP per capita means are expected to decrease by the help of cooperation and “indicated” integration. The convergence of developing countries’ GDP per capita average to developed countries’ is a desired result for their selves. However, the convergence rate presents disparity among developing countries. It is taught that, this result comes from the variation in unemployment rate among developing countries. As an example; a cross-country analysis of the Okun’s coefficient is done and a convergence is found for European countries in Perman & Tavare (2005).

To this end, the relation between output per capita and unemployment is observed for drawing out those disparities on countries. It is known that unemployment is one of principle economic problem for developing countries. Proposing an economic policy about to decrease unemployment level in developing countries by using this relationship between output per capita and unemployment rates is the aim of this study. Through this purpose, Okun (1962) found an increase relationship between output and unemployment that has been stated after him as Okun’s Law. What Okun (1970) stated was; a percentage point change in the unemployment is associated around three percentage change in output in the inverse direction. This is accepted as a rule of thumb for policymakers who wanted to solve unemployment problem. However, more recent predictions by Mankiw (1994) and Gordon (1998), suggested that this rule of thumb is much closer to two than three percentage (Lee, 2000).

Okun's law is a crucial concept not only for theoretically but also for empirically. Theoretically, it comes from Keynesianism that is a connection "*between the aggregate supply curve and Phillips curve*" and empirically, “*Okun’s coefficient is a useful “rule of thumb” in forecasting and policy –making*” (Harris & Silverstone, 2001). In related to this rule as an estimation, Freeman (2000) found this coefficient “2” for all time periods and across regions of the U.S..While, Prachowny (1993), estimates the Okun’s coefficient for the U.S. economy is about -0.668, Freeman (2000), measures the Okun’s coefficient around -2 for all time periods and across U.S. regions. In a close observation for U.S., Grant (2018) mentions the Okun’s coefficient was equal to -2, except for the period of the Great Recession, but it had risen and stayed around -0.5 after that. Anadu (2005), reports the average estimated the Okun’s coefficient as -1.58 under Hodrick-Prescott detrending method and -1.32 under the quadratic detrending method for ten Canadian provinces.

The differences in findings of the studies are thought to be caused from preferred model differences, differences in the assumptions of the model, economic and cultural differences in international geographic regions. However, the common side of those all studies is the value of Okun’s coefficient which is not higher than “three”. Economic mean of this numerical rate can be summarized as; “if a country increases its output value 3% annually, the unemployment in that country will decrease 1% annually.”

The empirical predictions about Okun’s Law are considered both national (OECD countries, Asian-Pacific countries, G7 countries and some additional countries to G7 countries) and regional (Spainish regions, Canadian provinces, US’s regions, Greek Regions, Finnish Regions, Czech and Slovak regions). The empirical study examples for country comparisons are; Lee (2000), Viren (2001), Pierdzioch et al.(2011), Rülke (2012), Kim et al. (2014), Ball et al.(2015), Guisinger & Siclair (2015), Bhattarai (2016) and Tang & Bethencourt (2017).

Lee (2000) evaluated the robustness of the Okun's Law for OECD countries. Viren (2001) tested the Okun's Law for OECD countries and showed the existence of non-linearities for Okun curve. And also estimated a threshold level for countries. Pierdzioch et al.(2011) reported the Okun's Law is valid by showing an evidence for G7 countries. Rülke (2012) used survey data to test the validity of Okun's Law and found robust results for Asian-Pacific countries. Kim et al. (2014) tested the Okun's Law for East Asian countries by using a smooth time-varying parameter method. Guisinger & Siclair (2015) predicted Okun's Law for the G7 countries plus Australia and New Zealand. They showed the same relationship however the degree of relationship is weaker than the initial studies for OECD countries. Ball et al. (2015) stated a negative correlation between real GDP growth and the change in unemployment for nine advanced countries. Bhattarai (2016) showed the consistency of Okun's Law for OECD economies. Tang & Bethencourth (2017) investigated the asymmetric unemployment-output tradeoff in Eurozone.

On the other hand, the empirical study examples of regional comparisons can be given as Freeman (2000), Adanu (2005), Christopoulos (2004), Villaverde & Maza (2009), Kangasharju et al. (2012), Durech et al. (2014), Azorín & Vega (2017) and Guisinger et al. (2018). Freeman (2000), tested the Okun's coeffiecient for U.S. regions. Christopoulos (2004) confirmed the Okun's law for "6" Greek regions. Adanu (2005) estimated the Okun's coefficients for ten Canadian provinces. Villaverde (2009) anlyzed the robustness of Okun's law in Spanish regions and Azorín & Vega (2017) calculated the Okun's coefficient for Spanish provinces. Kangasharju et al. (2012) showed the valitdy of Okun's law for the Finnish Regions. Durech et al. (2014) presented regional evidence on Okun's Law for Czech Republic and Slovakia. Guisinger et al. (2018) found the Okun's coefficiend for U.S.'s states.

The aim of this study which will make a contribution to examples of national level is to predict Okun's coefficient for G-20 countries for the period 1991-2014 annually. In addition, this paper uses the first-difference model and the "gap" model firstly suggested by Okun (1970). Three different filtering methods; HP, CF and BW are conducted for the gap specification method. By knowing Okun's coefficient which presents the relationship between unemployment and output level for each G-20 countries, it is possible to show the difference between developing and developed country which is one of the important indicators of economy from the perspective of unemployment and growth.

The remaining part of the study is organized as follows. The methods are presented in Section 2. The empirical findings are discussed and the economic outcomes are made through different Okun's coefficients among countries in in Section 3. The conclusion and policy recommendations are given in Section 4.

2. Methods

Okun (1962) proposes three different approaches for statistical estimates of the relation between output and unemployment rate. One of them is the first difference, the second one is trial gaps, and the third one is fitted trend and elasticity. This study uses the first and the second techniques for predicting the above-mentioned relationship. In the case of the first difference model, the relation can be expressed as in Eq 1. Here, y_t is the natural log of observed output and u_t is the natural log of unemployment rate.

$$y_t - y_{t-1} = \alpha + \beta(u_t - u_{t-1}) + \varepsilon_t \quad (1)$$

In Eq 1, while α is the constant term, β is the indicator that measures the Okun's coefficient, and ε_t is the error term.

In the other case of “gap” model, the relation can be expressed as in Eq 2.

$$y_t - y_t^* = \alpha + \beta(u_t - u_t^*) + \varepsilon_t \quad (2)$$

In Eq 2 y_t^* indicates the natural log of potential output, and u_t^* indicates the natural log of the rate of unemployment. The other unknowns are the same as stated in Eq 1. The reason of why do we call Eq 2 is a “gap” model is; the term ($y_t - y_t^*$) indicates the output gap, and the term ($u_t - u_t^*$) represents the unemployment gap. These two gaps can also be called as the cyclical level of the output and cyclical rate of the unemployment, respectively. Likewise in Eq 1, the requirements of stationary and cointegration conditions have to be controlled for Eq 2.

These two methods for Okun’s law are both preferred in this study. Similar results are looked for the estimations and some comparisons are tried to make. However, for the “gap” model the data for y_t^* and u_t^* have to be generated, because there is no available data for two variables. To this end, the trend series for y_t^* and u_t^* are obtained by some techniques. The techniques that are used to generate the trend series for y_t^* and u_t^* are the Hodrick-Prescott (HP) filter, Christiano-Fitzgerald (CF) filter, and Butterworth (BW) filter.

Let’s assume that y_t is defined as a time series. In this case, the cyclical component can be expressed as[1];

$$c_t = B(L)\, y_t = \sum_{j=-\infty}^{\infty} b_j\, y_{jt-j} \quad (3)$$

where the coefficients b_j are the impulse-response function of any filter. The impulse-response function can be defined as a square wave in which the inverse of Fourier transform is taken in the case of the filter is a band-pass, or a step function, in the case of the filter is a high-pass. Eq (3) can be approximated by changing the boarders of the sequence from infinite to finite value by making following changes as it is shown in Eq (4);

$$\widehat{c_t} = \widehat{B_t}\,(L)\, y_t = \sum_{j=-n_1}^{n_2} \widehat{b_j}\, y_{jt-j} \quad (4)$$

The relationship between finite sequence estimate and its true cyclical component can be expressed as in Eq (5);

$$\widehat{c_t}(\omega) = \widehat{B}(\omega)\, y(\omega) \quad (5)$$

and as in Eq (6) respectively, in here while $\hat{B}$(w) is the frequency transfer function of the filter $\hat{B}$, B(w) is the frequency transfer functions of the filter B.

$$c(\omega) = B(\omega)\, y(\omega) \quad (6)$$

In addition to this, the B(ω) can be written as;

$$B(\omega) = |\, B(\omega)\, |\ \mathrm{Exp}\, \{i*\theta(\omega)\} \quad (7)$$

in the polar form. In Eq (7) |B(ω)| is called as the gain function. And θ(ω) is called the phase function of a filter. When a particular frequency is adjusted the increase of decrease at the amplitude of the stochastic cycle is determined by the gain function. On the other hand, when a particular frequency is adjusted the shift to forward or to backward, this is determined by the phase function.

In the frequency domain, the spectrum of the component can be shown as in Eq (8);

$$f_c(\omega) = |\, B(\omega)\, |^2\, f_y(\omega) \quad (8)$$

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[1] More information can be found in “Stata Time Series Reference Manual Release 13”, (2013, 478).

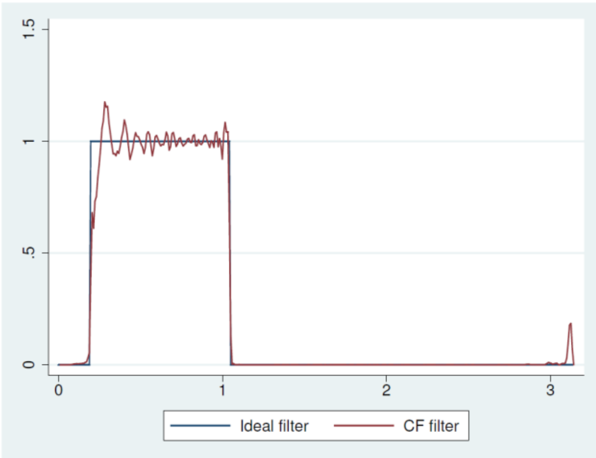
where, $f_c(ω)$ is the spectrum of the cyclical component and $f_y(ω)$ is the spectrum of the y_t series in frequency domain.

The CF filter, which is classified in the band-pass filters, uses a square wave for the "ideal" transfer function as follows in Eq (9);

$$B(ω)= \begin{cases} 1 & if\ |ω| \in [ωl, ωh] \\ 0 & if\ |ω| \notin [ωl, ωh] \end{cases} \tag{9}$$

It is shown in Figure 1 what really makes a possible CF filter in compare to an ideal filter.

Figure 1: A comparison of a CF filter with an ideal filter



Source: Stata Time Series Reference Manual Release 13, (2013).

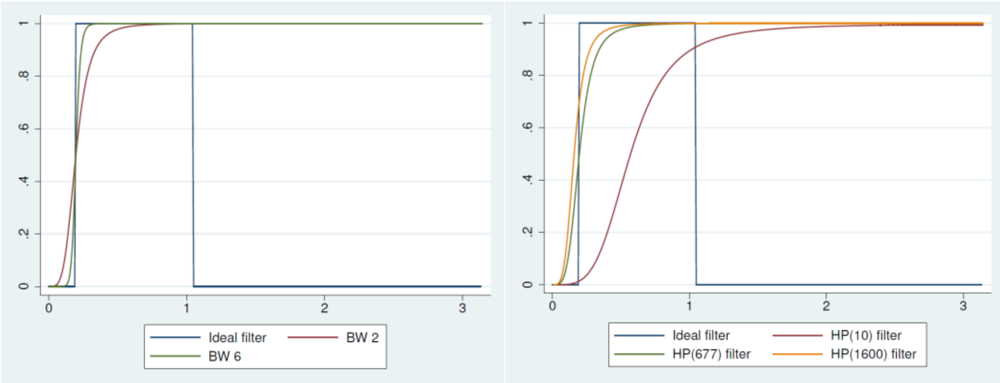
Christiano et al. (2003) assumes that the raw series is a process of random walk. The mean squared error is minimized between the estimated and the real component. They indicate following reasons for using this filtering technique: 1) The structure of the data can affect optimal filter. 2) Random-walk processes is the good way for approximating time series 3) Their filter's advantage is; during a random walk process while the desired frequencies passes through stochastic cycles, the unwanted frequencies is blocked .

The HP and BW filters, which are classified in the high-pass filters, use a step function as follows in Eq (10);

$$B(ω)= \begin{cases} 1 & if\ |ω| \geq [ωl, ωh] \\ 0 & if\ |ω| < [ωl, ωh] \end{cases} \tag{10}$$

It is shown in Figure 2 what really makes a possible BW and HP filter in compare to an ideal filter.

Figure 2: A comparison of BW and HP filters with an ideal filters



Source: Stata Time Series Reference Manual Release 13, (2013).

The gain functions of BW filters are almost a flat line at 1 for the desired periods. And they are nearly a flat line at 0 for the unwanted periods (see Butterworth (1930) for details). BW filters have features that depend on the filters' parameters as it is understood from Figure 2 (see Pollock (2000) for details).

Hodrick et al. (1997) motivates the HP filter as a trend-removal technique. According to their approach, when a trend is specified by the technique in the data, and then the trend is removed by filtering the data. A parameter totally determines the smoothness. The trend becomes smoother as $\lambda \rightarrow \infty$. They recommend setting λ to 1600 for some quarterly data, as it is also shown in Figure 2.

3. Emprical Findings: Okun Coefficients for G-20 Countries

This section contains the statistical estimation of Okun's law for the period 1991-2014. As stated in methods section, two approaches are employed in statistical tests, for G-20 countries. In addition to this, the average values of the variables (the values are calculated by panel data techniques) for those 19 countries are calculated and named as G-20 which reflects the general vision. For making those calculations three steps are followed. In the first step, the first differences approach is conducted based on Eq 1. In the second step, the output and unemployment gaps are obtained using filtering techniques. In the third step, the cyclical parts of the output and unemployment series for G-20 countries and the average of 19 G-20 countries are plotted. The fourth and final step includes the Ordinary Least Squares (OLS) predictions of Okun's law from the series that are generated in the second step.

We can have a chance to compare all the countries by Figure 3 and Figure 4. While in Figure 3, we see the characteristics of the natural log of the GDP level, in Figure 4, we see the natural log of unemployment rate of G-20 countries for the period 1991-2014. The general tendency of the GDP level in Figure 3 is an increase. The increase rate is changing from country to country. But, when it is looked at the slope of the curves China seems the steepest and Japan seems the most flat one. Also one can observe that, in some countries such as; Argentina, India, and Russia the GDP level decreases for some periods. On the other hand, Figure 4 does not give definite characteristics about unemployment rate in the indicated period. We see both changing (increasing, decreasing) or stable (or less changing) rates in unemployment.

Figure 3: The natural log of GDP level versus time for 19 G-20 Countries

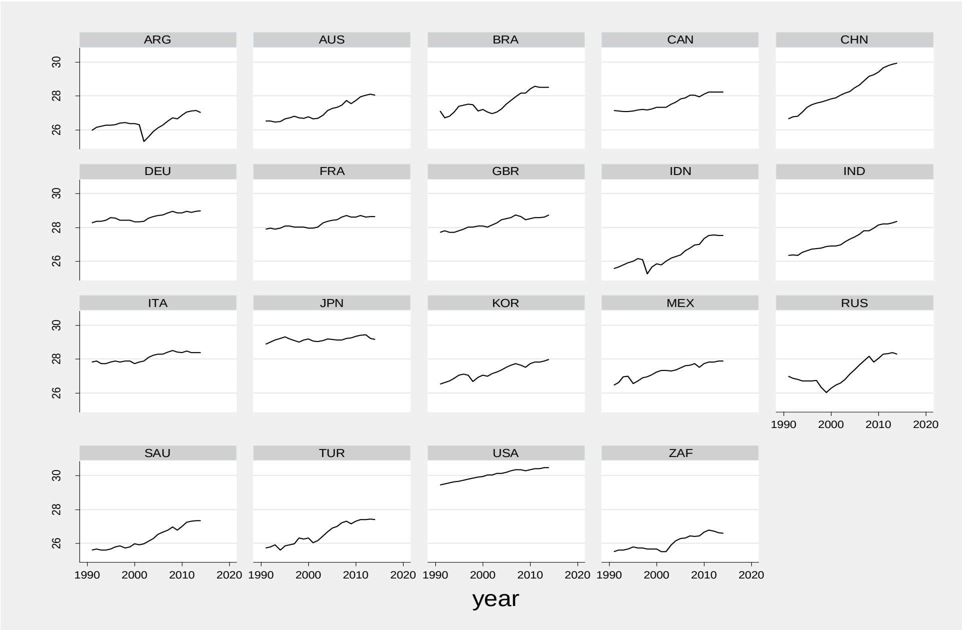


Figure 4: The natural log of unemployment rate versus time for 19 G-20 Countries

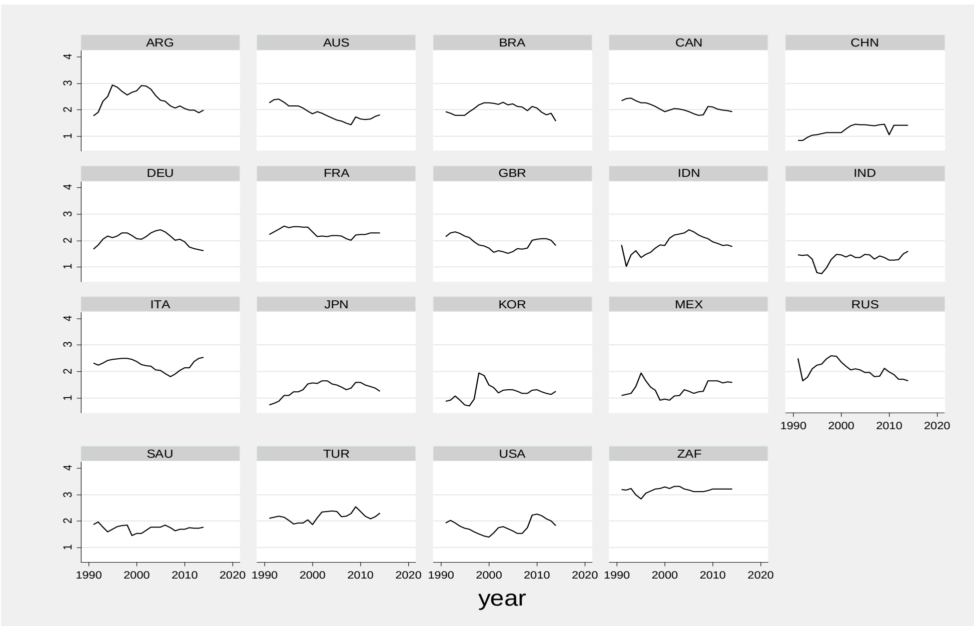


Figure 5a and Figure 5b presents the cyclical components of hp filter about GDP per capita (solid lines) and unemployment (dash lines) series for all countries. The opposite relationship between indicated variables as it is hypothesized by Okun hold for most of the countries with first look. However, some parallelism in solid and dash lines can be observed in some countries. These countries are China, Indonesia, Saudi Arabia and Turkey which are placed in Figure 5b. We notice that, one of the common features of the countries is all of them are belong to G-20 other than G-7. The other feature is; all those countries have highly populated developing countries. The last graph in Figure 5b shows the relationship for G20 which is the average values of all 19 G-20 countries and the inverse relationship between variables can easily be caught.

Figure 5a: The cyclical component from hp filter versus time for G-7 countries

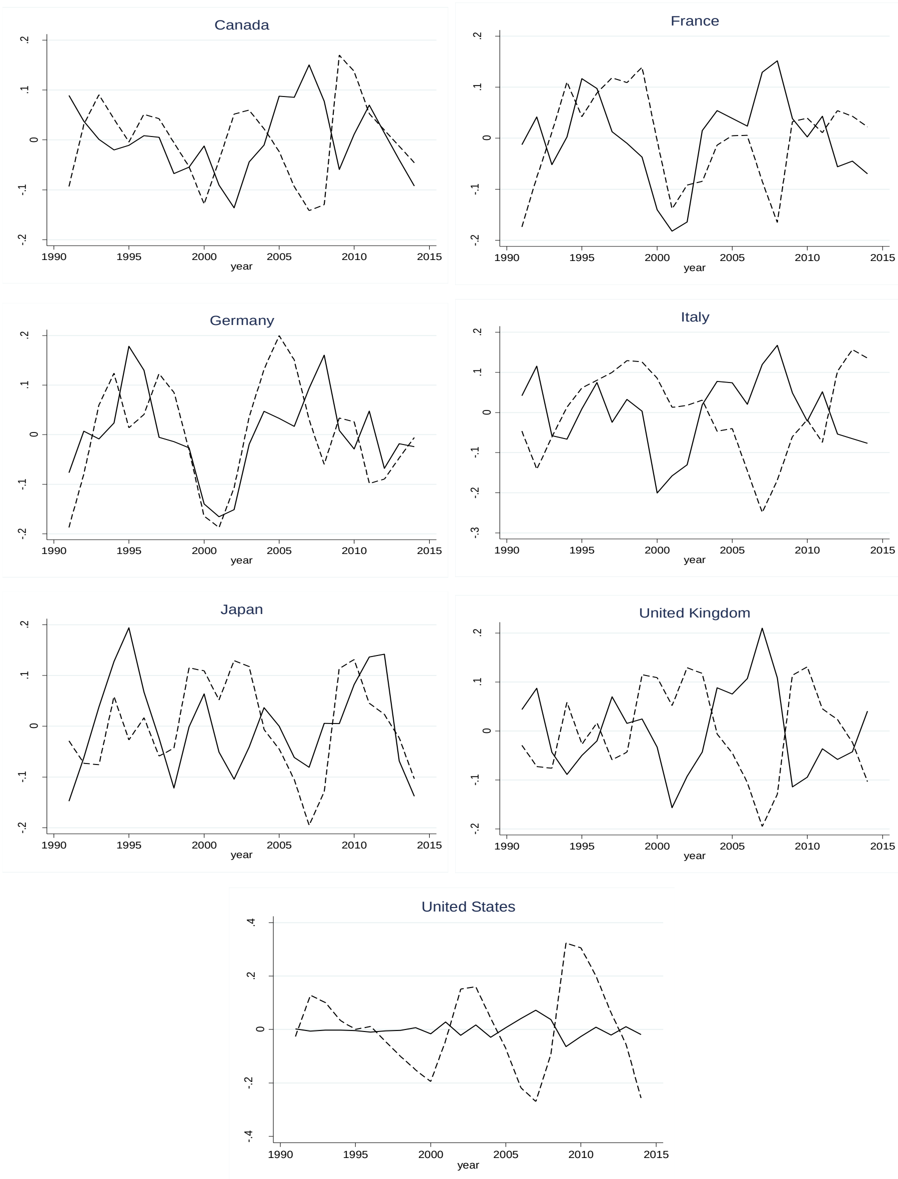
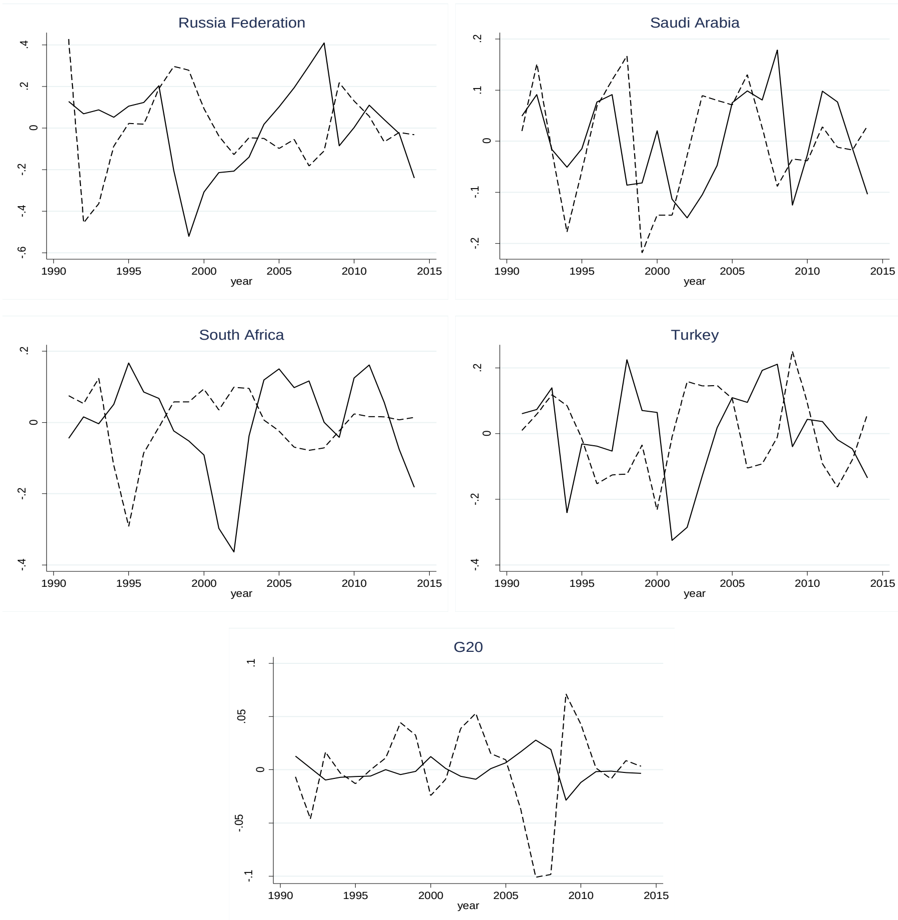


Figure 5b:The cyclical component from hp filter versus time for G-20 other than G-7and G20



Note: cyclical component from hp filter ____________ (solid) GDP per capita
cyclical component from hp filter _ _ _ _ _ _ _ _ _ (dash) Unemployment
Source: World Bank Indicators

Table 2 shows the statistical estimation of Okun's law between 1991 and 2014. According to Table 2 and first differences method, the Okun's hypothesis is validated for Canada, France, Italy, Argentina, Australia and Russia Federation. The Okun's coefficient for G-20 (in average value) is calculated as -3.22 which express the rule of thumb that is mention in introduction. However, the inverse relationship is not seen in Japan, United Kingdom, United States, China, India, Korea Republic, Mexico and Turkey. On the other hand, the trial gaps method says that, the Okun's hypothesis is hold for other countries than Japan, China, Indonesia, Saudi Arabia and Turkey. Three different filtering methods; HP, CF and BW is conducted for those tests. In average term, the test values of the Okun's coefficient for G-20 are -2.71, -5.79 and -4.99 for HP, CF and BW filters respectively.

Table 2: Statistical estimation of Okun's law between 1991 and 2014

Countries	First differences			Trial gaps: Hodrick-Prescott filter (HP)			Christiano_Fitzger-ald filter (CF)			Butterworth filter (BW)		
	β_1	R^2	t	β_1	R^2	t	β_1	R^2	t	β_1	R^2	t
Canada	-1.57*	0.47	-4.30	-0.33**	0.15	-1.97	-2.56*	0.89	-13.10	-1.97*	0.61	-5.90
France	-1.08*	0.33	-3.23	0.03	0.01	0.17	-3.02*	0.43	-4.05	-1.14*	0.34	-3.38
Germany	-0.25	0.05	-1.10	0.39*	0.23	2.56	-0.73*	0.16	-2.06	-0.40*	0.17	-2.14
Italy	-0.90*	0.44	-4.08	-0.48*	0.33	-3.31	-0.56	0.02	-0.72	-0.42**	0.12	-1.74
Japan	0.18***	0.13	1.80	0.31	0.10	1.50	0.45*	0.72	7.54	0.17*	0.33	3.30
United Kingdom	0.82*	0.40	3.74	-0.74*	0.59	-5.66	1.45*	0.69	7.01	0.94*	0.48	4.54
United States	0.27	0.05	1.03	-0.10*	0.33	-3.30	1.54*	0.12	1.72	0.52***	0.12	1.71
Argentina	-0.64*	0.29	-2.94	-0.32	0.05	-1.06	-0.83*	0.14	-1.89	-0.55*	0.43	-4.03
Australia	-1.50*	0.64	-6.07	-0.74*	0.31	-3.20	-2.30*	0.87	-12.04	-1.63*	0.69	-6.95
Brazil	-0.68	0.04	-0.95	-0.26*	0.01	-0.52	-3.05*	0.44	-4.18	-0.54	0.04	-0.92
China	3.68	0.60	5.56	-0.15	0.03	-0.76	4.93*	0.84	10.97	4.66*	0.75	8.11
Indonesia	0.64***	0.11	1.60	-0.27	0.05	-1.11	2.13*	0.28	2.95	0.96*	0.23	2.53
India	0.51	0.02	0.76	-0.21*	0.29	-3.03	3.25*	0.29	3.00	1.75**	0.16	2.07
Korea Republic	0.06	0.01	0.18	-0.42*	0.62	-5.98	1.02*	0.17	2.18	0.88**	0.16	2.06
Mexico	0.19	0.01	0.55	-0.33*	0.34	-3.36	2.14*	0.50	4.67	0.75**	0.16	2.02
Russia Federation	-1.81*	0.49	-4.49	-0.32***	0.09	-1.51	-1.91*	0.77	-8.55	-1.88*	0.54	-5.08
Saudi Arabia	-0.19	0.01	-0.18	0.24	0.07	1.32	-2.14	0.08	-1.36	-1.76	0.03	-0.87
South Africa	-0.10	0.01	-0.11	-0.78*	0.26	-2.80	1.76	0.06	1.18	1.74***	0.10	1.55
Turkey	1.65*	0.21	2.33	-0.34	0.08	-1.41	3.58*	0.48	4.48	2.89*	0.40	3.81
G20	-3.22*	0.30	-2.99	-2.71*	0.20	-2.26	-5.79*	0.39	-3.77	-4.99*	0.41	-3.93

Note: The terms *,**, and *** refer statistical significance at the 1%, 5% and 10% levels, respectively.

4. Conclusion and Policy Recommendations

This study has predicted Okun's coefficients for the G-20 countries and for their mean value named as G-20. Various findings have reached by conducting first differences approach and trial gaps methods (HP, CF, and BW filters) from time series and panel data analysis techniques. The aim of the research is to look if Okun's law holds for G-20 countries and as a whole, and to suggest output level/unemployment rate forecasts. It is found that, Okun's law is hold for most of the G-20 countries such as; Canada, France, Germany, Italy, United Kingdom, United States, Argentina, Australia, Brazil, India, Korea Republic, Mexico, Russia Federation and, South Africa. The law is also hold for G-20 in average terms. Therefore it can be said that, the rule of thumb is satisfied in this paper. The country response of output level to unemployment rate is observed to be varied with numbers changing from +4.93 to -3.05 country to country. The coefficients for the mean values are varying from -2.99 to -5.79. It is seen from countries' plotted figures that, in some periods the output level and unemployment rates behave as if they move in the same direction which results in a positive Okun's coefficient. For the countries China, Indonesia, Saudi Arabia, and Turkey the Okun's hypothesis is not satisfied. When we look to the cyclical component from HP filter the direction of the relationship seems same between 1995 and 2000 / 2006 and 2010 for China, 2002 and 2006 / 2010 and 2015 for Saudi Arabia, 1990 and 2000 / 2010 and 2013 for Turkey.

This study is slightly different from other related studies with its application region. The Okun's law for G7 countries is studied by Pierdzioch et al. (2011), however, this research is a primitive for G-20 countries which creates a platform to distinguish countries according to their development levels.

After these calculations, finally, it is worth to say that, Okun's law is not satisfied for the countries which are in the category of developing (out of G7 countries). In other words, all of the G7 countries obey the Okun's hypothesis. Besides that, the hypothesis is hold for some developing countries such as; Argentina, Australia, Brazil, India, Korea Republic, Mexico, Russia Federation and, South Africa. This can be explained by stability conditions in their economies. It is seen that some cyclical periods such as economic crises make routine economy complex and create unpredictable circumstances. This situation possibly affects the countries' development. The lesson that is understood from here; Okun's coefficient is a reliable equipment as far as the economic stability is satisfied.

On the other hand, the reason of the countries which do not satisfy the Okun's coefficient (China, Indonesia, Saudi Arabia and, Turkey) with at least one of filtering techniques can be the population growth. These four developing countries have high population numbers and positive population growth rates in common (India is the exceptional country from this perfective, it can be checked from Table 3 at Appendix). Therefore, it is not surprising to encounter with high and increasing unemployment rates and output increase at the same time in those countries. Therefore, these four economies should be careful in terms of basic economic indicators such as unemployment rates and sustainable growth levels. They need to redesign their economic policies considering current global systems' features, including their fast population increase problem.

Appendix

Table 1: GDP per capita mean values and their standard deviations for G-20 countries

country name	number of observation: (1991-2014)	mean	standart deviation
Canada	24	33328.84	3918.695
France	24	33035.73	2763.52
Germany	24	34438.46	3201.598
Italy	24	30010.04	1889.194
Japan	24	34737.16	1789.485
United Kingdom	24	36173.74	4687.182
United States	24	40729.2	4497.036
Argentina	24	5.855.893	1049.126
Australia	24	31747.53	4506.375
Brazil	24	4.754.617	6446.861
China	24	1.729.609	1045.053
Indenosia	24	1.273.854	2766.733
India	24	7.098.708	2592.186
Korae Republic	24	16988.02	4741.879
Mexico	24	7.643.885	5929.396
Rusia Federation	24	5026.24	1299.195
Saudi Arabia	24	13495.83	1760.387
South Africa	24	5294.36	549.164
Turkey	24	6.665.991	1240.375
Total	456	18086.26	14658.57

Source: World Bank Indicators

Table 3: The population number and population growth for some countries in 2014

countries	population in 2014	population growth in 2014
China	1364270000,00 (1.4 billion)	0,51
Indonesia	254454778,00 (255 million)	1,26
Saudi Arabia	30886545,00 (31 million)	2,24
Turkey	75932348,00 (76 million)	1,22
India	1295291543,00 (1.3 billion)	1,23

Source: World Bank Indicators

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